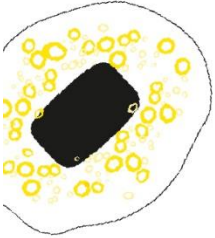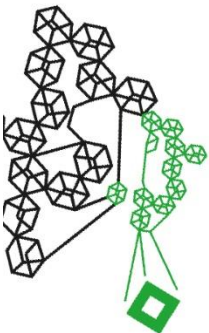# UNIVERSITY OF TWENTE

# Supplier Influence on Innovation Acceptance:

# A Study on Extramural Healthcare Professionals

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January 2025

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# Acknowledgements

I am grateful to my supervisor, Dr. K. Stek, for guiding me through the thesis process and providing valuable insights that improved my research. I also thank my second supervisor, Dr. Dipl. Ing. J. Sieber, for the feedback on the thesis. I appreciate the support from the University's Writing Centre, which helped enhance my academic writing skills.

I acknowledge the participants who contributed to this research. Their input was crucial for the insights presented in this study.

Lastly, I used ChatGPT during this research for spelling and grammar corrections and to create the model featured in the management summary.

Daan Pierik,

January 2025

## List of abbreviations

CPOE – Computerized Provider Order entry

EHCO – Extramural Healthcare organisation

EHR – Electronic Health Record

HIT – Health Information Technology

HCP – Healthcare Professional

OECD – Organization for Economic Cooperation and Development

PPP – Public Procurement Professional

PSM  – Purchasing and Supply Management

TA – Tech Ambassador

## Management summary

The Dutch healthcare system faces increasing pressure. An ageing population, rising demand for home care, and a critical shortage of healthcare professionals (HCPs) necessitate urgent innovation to maintain high-quality care. As the population ages and life expectancy increases, the prevalence of chronic illnesses and multi-morbidity strains resources. In response, the Dutch healthcare sector has focused on providing extramural care delivered in patients' home environments rather than a hospital, focusing on a patient-centred approach.

The shift to extramural care is leading to a rising demand for healthcare services, especially nurses and nursing assistants, which risks the quality of extramural care. Innovation is essential to reduce workforce strain and maintain high-quality care. Healthcare innovation includes creating and using new or improved health policies, systems, technologies, services, and delivery methods to enhance health outcomes. For instance, mobile health apps can streamline processes, improve efficiency, and support HCPs in their daily work. Given the pressing need for innovation, it has been sourced from suppliers. Suppliers are involved in innovation by providing innovative components and products, advancing technology, and engaging in collaborative product development initiatives.

The focus on a shared vision and collaboration underscores the importance of attracting and procuring innovation from buyers' perspective. Achieving this requires combining competencies and hard and soft skills in healthcare procurement to drive successful innovation. These competencies and skills connect technical implementation with human-centred adoption, ensuring innovations are aligned with organisational objectives. However, adopting innovations in healthcare often encounters significant challenges, including resistance from HCPs due to organisational, technological, and personal barriers. Overcoming these hurdles is crucial, as user acceptance and the willingness of HCPs to adopt and integrate new technologies play pivotal roles in driving innovation success. Despite the recognised importance of supplier collaboration in the innovation process, there is limited understanding of how suppliers contribute to this process in extramural healthcare. This study seeks to fill this gap by examining the role of suppliers in facilitating user acceptance of innovations in extramural healthcare. To guide this exploration, the study addresses the following research question:

RQ: Which roles do suppliers play in facilitating the user acceptance of innovations among professionals in the extramural healthcare sector?

To provide a comprehensive answer, four sub-questions are considered:

Sub RQ1a – How do the suppliers currently contribute to the innovation processes?

Sub RQ1b – How should suppliers contribute to future innovation processes?

Sub RQ2a – Which skills/competencies belonging to which roles do extramural healthcare sector professionals have in facilitating the acceptance of innovations amongst their colleagues?

Sub RQ2b – Which skills/competencies belonging to which roles must extramural healthcare sector professionals develop in facilitating the acceptance of innovations amongst their colleagues?

A literature review has been conducted to explore the research questions and gather comprehensive insights fully. The focus of the literature review first shifts to suppliers' involvement in innovation in healthcare. Innovation is crucial for optimising healthcare quality, efficiency, and patient outcomes. It encompasses creating and implementing novel or enhanced systems, products, and services. The shift toward patient-centred, value-based care underscores the need for external collaboration, particularly with suppliers, to drive successful innovation. Healthcare organisations can leverage innovation sourcing—the strategic pursuit of external ideas and technologies—to access essential resources and expertise. Buyer-supplier solid relationships, built on a foundation of trust and collaboration, are paramount for fostering innovation. For solid relationships with the buyer, healthcare procurement is vital for fostering innovation. To attract and implement innovations, public procurement professionals (PPPs) must combine hard skills, such as technical expertise, with soft skills, like creativity and communication.

In addition, it is also essential to consider the various stages through which healthcare innovation progresses: dissemination, adoption, and implementation. Dissemination involves proactively sharing evidence-based interventions with target audiences. Adoption requires integrating innovations into existing systems, influenced by an organisation's openness, characteristics, and environment. Adequate preparation, including IT management and procurement involvement, is crucial. Implementation strategies ensure the spread and acceptance of innovations. Success depends on research, planning, organisational solid foundations, establishing clinical context, and effective facilitation. The success of the stages is linked with HCPs's acceptance of innovation. Factors influencing acceptance include perceived ease of use, usefulness, and familiarity with the technology. Addressing these concerns with tailored training programs, user-friendly interfaces, and proactive privacy measures is essential for successful adoption. Individual differences such as personal innovativeness, profession, speciality, gender, and age also affect technology acceptance.

To further explore this, the research delves into the methods employed by suppliers to foster employee acceptance of innovations in the extramural healthcare sector, utilising qualitative research. A semi-structured interview format was chosen to facilitate comprehensive and in-depth data collection. The participants in the study were HCPs, suppliers of innovation in the extramural healthcare sector, and procurement specialists. Eleven semi-structured interviews were conducted, recorded, transcribed, and coded. The Gioia method was used for the coding process.

The study reveals that suppliers play a critical role in facilitating the acceptance of innovations among HCPs in the extramural healthcare sector. Their contributions extend beyond providing products to include strategic collaboration. By building trust, co-creating tailored solutions, and

supporting implementation through training, data analytics, and coaching, suppliers address barriers such as cost uncertainties and adoption challenges, enhancing the adaptability and resilience of the healthcare system. Tech ambassador (TA) serves as crucial intermediaries between suppliers and HCPs, leveraging their technical expertise and strong communication skills to guide innovation adoption. TAs effectively address HCP concerns, such as resistance from perceived complexity, ensuring innovations are smoothly integrated into daily practice. Key factors influencing acceptance, including age, education, and user-friendliness of innovations, highlight the importance of adopting tailored approaches to meet diverse needs. Suppliers drive patient-centred transformation by aligning innovations with the specific needs of extramural healthcare organisations (EHCOs), overcoming challenges, and fostering collaboration. These findings underscore the importance of supplier engagement as a cornerstone for successful innovation adoption in the extramural healthcare sector.
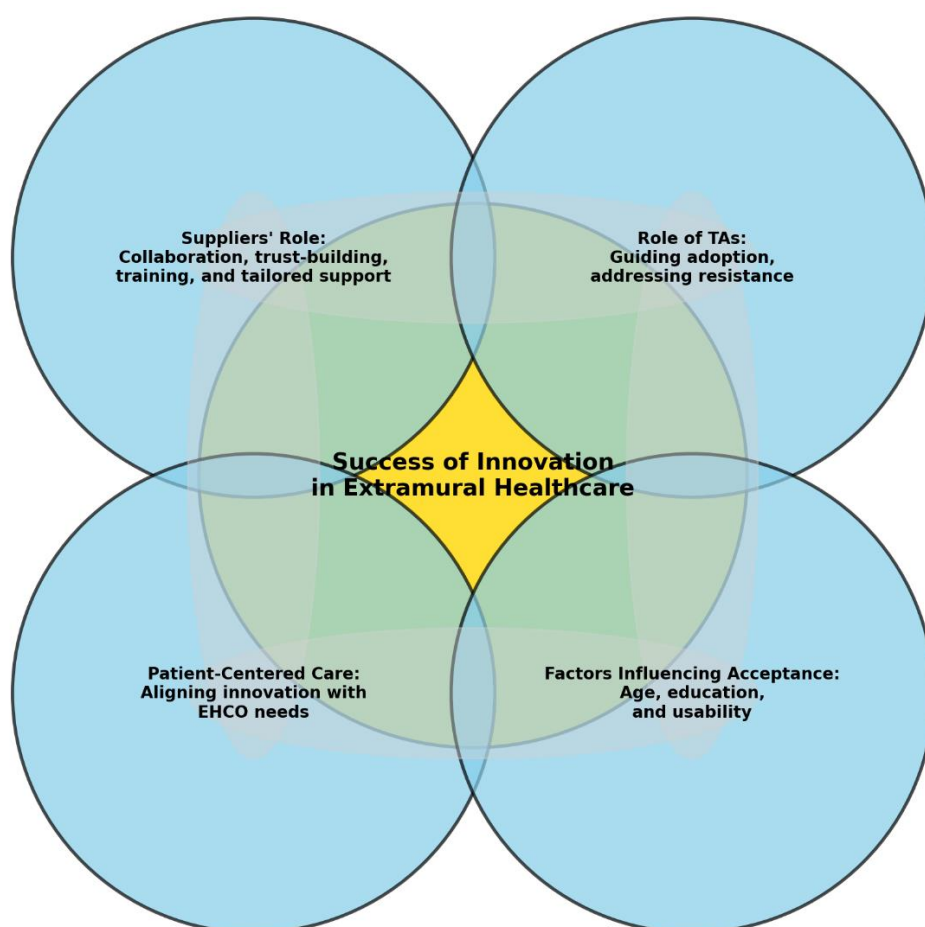


*Figure 1: Main outcomes of the study*

This study contributes to the theoretical understanding of innovation in extramural healthcare by redefining innovation as a dynamic, patient-centred process. It emphasises the role of suppliers as strategic collaborators, introduces a broader conceptualisation of the role of TAs, and identifies key skills and competencies required for innovation success. By bridging supplier management with healthcare innovation, the study provides a perspective on how co-creation, shared vision, and strategic alignment can drive effective innovation adoption in extramural

healthcare. The practical implications of this study emphasise the need for HCPs to develop essential skills, for suppliers to engage in co-creation and offer comprehensive training, and for policymakers to create a supportive environment for innovation. These actions will significantly improve the adoption and integration of innovations within extramural healthcare, leading to a more patient-centred, efficient care system.

Keywords: Extramural Healthcare, Innovation, Supplier Collaboration, Qualitative research

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## 1. Introduction

The need for innovation in the Dutch healthcare system has never been greater. The Dutch healthcare system is having problems because of a) an ageing population (Smits et al., 2014, p. 336), b) an increasing demand for home care (van Iersel et al., 2019, p. 2), and c) a critical shortage of healthcare professionals (HCPs) (Van Merode et al., 2024, p. 1353). These problems must be resolved to prevent the importance of the quality of healthcare and the stakes if the above-described problems are not resolved. While innovation holds the potential to improve care delivery significantly (Lovink et al., 2018, p. 2), its success hinges on collaboration between HCPs and suppliers and, crucially, on the acceptance of innovations by HCPs themselves.

The Netherlands is experiencing a significant increase in its ageing population, those aged 65 or older. Ageing is characterised by the gradual decline in physiological function that leads to reduced capabilities and eventual mortality (López-Otín et al., 2013, p. 1194). From 2000 to 2023, the ageing population rose from 2 million to 3.6 million, representing a 67% increase (CBS, 2023). This trend is projected to continue in the upcoming decade, primarily due to the ageing baby boomer generation, defined by a high birth rate during the latter half of the twentieth century (Gilleard & Higgs, 2008, p. 20; Kanasi et al., 2016, p. 14).

Additionally, life expectancy in the Netherlands has increased over the past two decades. The average life expectancy (men and women) has risen from 78.2 to 81.7 years (OECD, 2023). The rise in life expectancy can be attributed to several factors, including enhanced environmental quality (Mariani et al., 2010, p. 25), improvements in the effectiveness and accessibility of healthcare (Mathers et al., 2015, p. 547), and reductions in exposure to environmental, behavioural, and biological risk factors (Mathers et al., 2015, p. 547). This combination of a growing ageing population and increased life expectancy places pressure on the Dutch healthcare system, as the incidence of chronic illnesses, multi-morbidity (multiple health conditions), and public health concerns rise with an ageing population, leading to a surge in demand for healthcare services (Holterman et al., 2021, p. 1883).

To meet the demands of this evolving demographic landscape, the Dutch healthcare sector is adapting its approach to delivering healthcare services. Therefore, the healthcare sector has shifted from providing care within hospital settings (intramural) to delivering care in patients' home environments (extramural) (Tummers et al., 2013, p. 2827; van Iersel et al., 2019, p. 2). This shift reflects the sector's efforts to provide more patient-centred care, where patients are treated within the context of their social environments, listened to, empowered, and involved in their care (Epstein & Street, 2011, pp. 100-101).

The shift to extramural care is leading to a rising demand for healthcare services. Coupled with the trends of an ageing population and increased life expectancy, this demand is expected to grow even further, intensifying the challenges faced by the extramural healthcare workforce in capacity. The increasing demand for care is placing unprecedented strain on the Dutch healthcare workforce, especially nurses, who constitute the largest segment of this sector (Baumann & Crea-Arsenio, 2023, p. 1). However, the Dutch healthcare system is grappling with

a severe shortage of nurses, particularly among those providing extramural care (Van Merode et al., 2024, p. 1353). This shortage is most pronounced among vocationally trained nurses *(mbo-verpleegkundige)* and nurse assistants *(verzorgende mbo niveau 3)* (Van Merode et al., 2024, p. 1355), with a deficit of 8,300 to 8,700 full-time equivalent (FTE) and 9,700 to 10,100 FTE in 2023 (Helder, 2023, p. 5). This critical shortage threatens the quality of extramural care. The vocationally trained nurses and nurse assistants will be referred to as HCPs for the remainder of this study.

The persistent labour shortages of HCPs in extramural healthcare underscores the critical need for innovation in healthcare delivery. Innovation is essential to alleviate the strain on the HCPs and ensure the continued provision of quality care (Lovink et al., 2018, p. 2). Such innovation has the potential to enhance service quality and patient well-being and to optimise existing healthcare systems (Flessa & Huebner, 2021, p. 1). Mobile health apps, for example, offer a promising avenue for streamlining information and communication processes, thereby supporting HCPs in delivering more efficient and effective care (Nouri et al., 2018, p. 1090). For instance, mobile health apps enable HCPs to manage patients, access medical references and research, diagnose conditions, retrieve health records, enhance medical education, provide consultations, gather and process information, monitor patients, and support clinical decision-making (Yasini & Marchand, 2015, p. 175). Leveraging these apps can play a crucial role in preventing emergencies that could require intensive care. However, mobile health apps face key limitations that undermine their effectiveness, including a lack of clinical evidence, poor integration with healthcare systems, and privacy concerns (Nouri et al., 2018, p. 1090). If these apps are used to facilitate early patient discharge without proper evaluation and integration, HCPs may face increased workloads to manage complications and unmet care needs.

Given the pressing need for innovation, exploring effective strategies for developing and implementing innovations, like the mobile health app, is crucial. One such strategy is innovation sourcing, where HCPs utilise suppliers' expertise to create novel ideas, technologies, and solutions (Abi Saad et al., 2024, p. 6). Suppliers contribute by providing inventive components and products (Schiele, 2006, p. 3), advancing technology (Schiele, 2006, p. 3), and engaging in collaborative product development initiatives (Azadegan & Dooley, 2010, p. 489). However, the complexities and uncertainties inherent in the healthcare sector necessitate a shared vision and close collaboration to ensure that innovations are effectively implemented and genuinely address the evolving needs of patients (Cannavale et al., 2022, p. 761). The focus on shared vision and collaboration highlights the critical role of attracting and procuring innovation from buyers' perspectives.

Building on this, successful healthcare innovation relies on a balanced combination of competencies and skills within healthcare procurement to achieve impactful outcomes. Competencies refer to a broader idea that includes using knowledge (Beske-Janssen et al., 2023, p. 2). Hard skills, such as technical expertise, facilitate the effective evaluation and seamless integration of innovations. Meanwhile, soft skills, encompassing personal attributes, motivations, and interpersonal abilities, are crucial for fostering collaboration and addressing

resistance (Heckman & Kautz, 2012, p. 451). These competencies connect technical implementation with human-centred adoption, ensuring innovations are aligned with organisational objectives. Specialised roles within Purchasing and Supply Management (PSM), such as innovation promoters, further enhance this process by addressing operational needs and meeting user expectations (Delke, 2022, p. 126).

Considering user acceptance—the willingness of HCPs to embrace and utilise innovations—is crucial for successful innovation adoption (Taherdoost, 2018, p. 961). This can be a significant hurdle, as innovation often necessitates organisational changes (Thakur et al., 2012, p. 564), which HCPs may resist due to factors like organisational obstacles, technological challenges, and professional and personal differences (Iyanna et al., 2022, p. 151). However, the influence of suppliers extends beyond simply providing innovative products or technologies; their role in fostering user acceptance among HCPs is crucial but remains underexplored.

Despite the recognised importance of supplier collaboration in driving innovation, there is limited understanding of how suppliers contribute to the innovation process in extramural healthcare. This gap in knowledge leaves the dynamics of supplier involvement in extramural care unexplored. This study seeks to address this gap by examining the role of suppliers in facilitating user acceptance of innovations in extramural healthcare, focusing on how their contributions can support the successful integration of new technologies and solutions in this sector. Therefore, the study aims to address the following research question:

RQ: Which roles do suppliers play in facilitating the user acceptance of innovations among professionals in the extramural healthcare sector?

To address the main research question, four sub-questions must be considered, which will facilitate providing a comprehensive answer:

Sub RQ1a – How do the suppliers currently contribute to the innovation processes?

Sub RQ1b – How should suppliers contribute to future innovation processes?

Sub RQ2a – Which skills/competencies belonging to which roles do extramural healthcare sector professionals have in facilitating the acceptance of innovations amongst their colleagues?

Sub RQ2b – Which skills/competencies belonging to which roles must extramural healthcare sector professionals develop in facilitating the acceptance of innovations amongst their colleagues?

A literature review has been conducted to explore the research question fully and gather comprehensive insights. The review delves into four significant topics contributing to the research question's framework: the involvement of suppliers in healthcare innovation, skills and competencies to attract innovation, the broader innovation landscape, and the factors influencing resistance to innovation. Following the literature review, the subsequent section outlines the research methodology. This section details the chosen research design, the approach to data collection, the method of data analysis, and the sampling process used to

select study participants. The findings, presented after the methodology section, provide valuable insights into the relationship between supplier involvement and acceptance of innovation among HCPs within the extramural healthcare sector. By examining the relationship, the research holds significance in addressing the evolving landscape of extramural care and its challenges. The results lead to a conclusion and, eventually, a discussion.

## 2. Literature background

### 2.1 Supplier involvement in healthcare

Schumpeter (1934, pp. 66-67) viewed innovation as the driving force behind economic progress, with technological advances and new business practices as sources for long-term economic growth. From this perspective, innovation is defined as encompassing any significant alteration in production methods, creation of new products, changes in company structures, or entry into a new market (Schumpeter, 1934, pp. 66-67). While Schumpeter (1934, pp. 66-67) focused on the economic process of innovation, Damanpour (1991, p. 393) delved deeper into how organisations can benefit from utilising innovation. According to Damanpour (1991, p. 393), innovation involves changes that enable organisations to adapt to environmental shifts and uncertainties by adopting new technologies or integrating technical and administrative changes to enhance goal achievement.

Building on these perspectives, innovation in healthcare encompasses developing new or improved health policies, systems, products, technologies, services and delivery methods that improve people's health (Syeed et al., 2022, p. 1158). Thakur et al. (2012, p. 564) emphasise the transformative potential of healthcare innovation, suggesting that it should empower HCPs to prioritise patient-centric care while enhancing efficiency, speed, quality, and cost-effectiveness. This focus on patient-centric care aligns with the concept of value-based healthcare of Porter (2008, pp. 504-508). The concept of value-based healthcare underscores that the full potential of healthcare delivery can only be realised when all stakeholders actively collaborate to enhance value. This approach emphasises the importance of establishing strong partnerships and relationships that enable integrated and coordinated care. Porter (2008, pp. 504-508) value-based healthcare framework is built on four core principles: defining value as the primary goal for every participant in the healthcare system, organising care delivery around value creation, effectively measuring value outcomes, and aligning reimbursement models to incentivise value-driven care. These principles provide a transformative blueprint for optimising healthcare systems and achieving superior patient outcomes.

The transition to patient-centred care and value-based healthcare of Porter (2008, pp. 504-508) has significantly influenced how the healthcare sector approaches innovation. In the past, innovation was primarily driven by resources within the healthcare sector without considering the external environment (Cannavale et al., 2022, p. 760). However, the healthcare sector increasingly embraces innovation sourcing, recognising that successful innovations often require access to complementary assets beyond a firm's internal resources (Teece, 1986, p. 304). This approach involves actively seeking new ideas, technologies, and solutions from external sources, in this context, external suppliers (Abi Saad et al., 2024, p. 6).

Innovation sourcing fosters collaboration between the healthcare sector and suppliers. Collaborating with suppliers offers several potential benefits, including facilitating the exchange of tacit and explicit knowledge, reducing technology market inefficiencies, and mitigating some risks and costs inherent in technological development (Greco et al., 2016, p. 503). However, it

is essential to acknowledge that collaboration requires investment, as coordinating with suppliers involves additional resources and expenses (Greco et al., 2016, p. 502).

The collaboration fostered through innovation sourcing leads to a buyer-supplier relationship, yielding benefits beyond the actual product or service exchange (Lindgreen & Wynstra, 2005, p. 737). One effective approach to establishing and nurturing a buyer-supplier relationship is through supplier development programs. These programs involve joint efforts between buyers and suppliers to enhance the supplier's performance and ensure alignment with the buyer's evolving needs (Krause, 1999, p. 206). Supplier development entails close collaboration, with both parties investing in knowledge transfer activities built on a foundation of trust and mutual benefit needs (Krause, 1999, p. 206). This emphasis on trust and mutual benefit is critical, as research indicates that robust supplier development programs positively influence relationship outcomes and contribute to overall success (Krause et al., 2007, p. 534). Notably, the active involvement of the buyer's procurement department is particularly crucial in this context. Schiele (2010, p. 141) found that suppliers were often willing to offer cost reductions on existing products in exchange for the opportunity to collaborate on the development of products.

Suppliers can play a dynamic role in fostering innovation by building on a solid buyer-supplier relationship. This can take various forms, from providing inventive components and products (Schiele, 2006, p. 935) to advancing technology (Schiele, 2006, p. 935) and engaging in collaborative product development initiatives (Azadegan & Dooley, 2010, p. 489). Furthermore, Koufteros et al. (2012, p. 109) suggest suppliers can provide valuable resources and capabilities to build competitive advantages. Moreover, research highlights how supplier involvement can mitigate procurement risks and contribute to a stronger competitive position by reducing transaction costs (Chakraborty et al., 2014, p. 679).

While supplier involvement can significantly benefit innovation, involving any supplier does not guarantee direct improvement in innovation performance. Choosing a supplier with inadequate capabilities can impede innovation performance and project progress (Li et al., 2022, p. 190; Zsidisin & Smith, 2005, p. 54). Therefore, identifying and selecting suppliers with a proven ability to contribute to innovation is crucial for buying firms. Various theoretical models have been developed to aid in selecting the most suitable innovative supplier. For instance, Rese (2006, pp. 79-80) introduced a decision model to choose the right supplier based on two main drivers: (i) the individualisation versus standardisation of delivered components combined with the potential of the end customers and (ii) the ability to distribute revenues among different partners in a value-creating network.

Conversely, to determine the most suitable supplier, Schiele (2006, p. 935) examines the specific characteristics of suppliers and their relational characteristics that positively impact innovation performance. Schiele (2006, p. 935) proposes that suppliers who specialise, possess technical expertise, are export-oriented, and are geographically proximate to the buyer positively impact innovation performance. Additionally, relational characteristics, such as trust and deeply engaged relationships, are crucial in shaping innovation performance (Schiele, 2006, p. 935).

Further research by Pulles et al. (2014, p. 414) indicates that supplier characteristics of professionalism and specialisation positively affect innovation performance. However, Pulles et al. (2014, p. 415) find that these characteristics are moderated by the supplier's collaborative attitude, suggesting that a supplier's willingness to engage and contribute to the innovation process actively is a crucial factor to consider.

Improving innovation performance also requires a commitment from the buyer to establish a buyer-supplier relationship. While buyers aim to leverage a supplier's best resources for competitive advantage, it's crucial to acknowledge that suppliers often work with multiple buyers, creating competition for these valuable resources (Pulles et al., 2016, p. 1473). Buyers should strive to achieve preferred customer status, which signals the buyer's attractiveness from the supplier's perspective (Schiele et al., 2011, p. 2). A buyer achieves preferred customer status when the supplier allocates preferential resources, such as assigning the best personnel to work on an innovation project. (Schiele, 2012, p. 47).

Cultivating customer attractiveness and supplier satisfaction are key drivers in achieving and maintaining preferred customer status (Hüttinger et al., 2012, p. 1194). Hüttinger et al. (2012, p. 1195) define customer attractiveness as the positive image a customer holds in the supplier's eyes, a crucial factor for suppliers deciding to initiate or intensify an exchange relationship. A buyer consistently meets or exceeds expectations cultivates supplier satisfaction (Hüttinger et al., 2012, p. 1194), leading suppliers who are very satisfied with a buyer to be more inclined to grant the buying firm preferred status. Vos et al. (2016, p. 4621) further identified four factors influencing supplier satisfaction: growth opportunities, profitability, relational behaviour and operative excellence. Interestingly, Schiele (2020, p. 135) measured these four factors alongside supplier satisfaction and preferred customer status across public and private organisations. This revealed that relational behaviour exerts a stronger influence on achieving preferred customer status within public organisations than private organisations.

Zooming in on the buyer-supplier relationship within the healthcare sector specifically, it becomes even more crucial for both parties to cultivate a shared vision (Cannavale et al., 2022, p. 761; MacLeod et al., 2020, p. 269). This shared understanding is essential for effectively capitalising on opportunities for change and encouraging innovative practices while navigating the inherent complexities and uncertainties of the healthcare landscape (Cannavale et al., 2022, p. 761; MacLeod et al., 2020, p. 269). Exogenous and endogenous factors influence buyer-supplier relationship dynamics in healthcare (Mettler & Rohner, 2009, p. 62). Exogenous factors, such as the regulatory environment, market structure, and rapid technological advancements, exert external pressures on the relationship (Mettler & Rohner, 2009, p. 62). Conversely, endogenous factors are internal to the organisations, including strategic positioning, employee behaviour, and organisational structure (Mettler & Rohner, 2009, p. 62).

The importance of a solid buyer-supplier relationship within healthcare is illustrated by the significant disruptions experienced during the COVID-19 pandemic. The pandemic caused substantial disruptions in the healthcare supply chain, leading to shortages of essential

protective equipment, medications, and treatment facilities, directly affecting patient care (Spieske et al., 2022, p. 1). The COVID-19 pandemic exposed the vulnerability and lack of resilience in the healthcare supply chain (Zamiela et al., 2022, p. 3). In this context, Mandal (2017, p. 1021) defines resilience as the ability to anticipate and prepare for uncertainties through comprehensive planning and collaboration with supply chain partners. Within the buyer-supplier relationship, resilience also plays a role, and factors such as redundancy, collaboration, and robustness can help increase it (Zamiela et al., 2022, pp. 13-14).

Table 1 comprehensively overviews how suppliers contribute to and can drive future innovation (Sub-RQ1a). It shows suppliers are key to innovation by providing innovative components, advancing technology, and collaborating on product development. The table also emphasises the importance of supplier characteristics like technical expertise and specialisation in enhancing innovation performance. In addition, Table 1 summarises how suppliers can contribute to future innovation (Sub-RQ1b). It underscores the importance of buyers focusing on selecting suppliers capable of driving innovation. Achieving preferred customer status is critical, requiring buyers to cultivate customer attractiveness and relational behaviour to gain preferential access to supplier resources and expertise. Furthermore, fostering trust and shared goals within buyer-supplier relationships is crucial for ensuring successful collaboration and sustained innovation in the future.

While existing research acknowledges suppliers' general contributions to innovation, their specific role in driving innovation within extramural healthcare remains largely unexplored. A comprehensive understanding of supplier involvement in this sector is crucial, moving beyond general perspectives to a detailed analysis of extramural healthcare.

*Table 1: Overview of supplier contribution in innovation process*

| Key points | Description | Source |
|---|---|---|
| Supplier role in innovation | Suppliers contribute to innovation through innovative components, technology advancements, and collaborative product development. | Azadegan and Dooley (2010, p. 489); Schiele (2006, p. 935) |
| Supplies capabilities and competitive advantage | Suppliers provide valuable resources and capabilities that help firms build competitive advantages and reduce procurement risks. | Chakraborty et al. (2014, p. 679); Koufteros et al. (2012, p. 109) |
| Importance of supplier selection | Selecting the right supplier is crucial for successful healthcare innovation; inadequate suppliers can hinder progress. | Li et al. (2022, p. 190); Rese (2006, pp. 79-80); Zsidisin and Smith (2005, p. 54) |
| Supplier characteristics impacting innovation | Suitable suppliers have a specialisation, technical expertise, and proximity, with trust-enhancing innovation. | Pulles et al. (2014, pp. 414-415); Schiele (2010, p. 935) |

| Investment in buyer-supplier relationship by buyer | Buyers should invest in relationships to achieve preferred customer status, which ensures access to the supplier's best resources for healthcare innovation. | Pulles et al. (2016, p. 1473); Schiele (2012, p. 47) |
|---|---|---|
| Critical drivers of preferred customer status | Customer attractiveness and supplier satisfaction are fundamental to preferred customer status, ensuring priority in healthcare innovation. | Hüttinger et al. (2012, pp. 1194-1195); Schiele (2020, p. 135); Vos et al. (2016, p. 4621) |
| Buyer-supplier relationship in healthcare | A shared vision between buyer and supplier is essential for navigating complexities and driving innovation in healthcare. | Cannavale et al. (2022, p. 761); MacLeod et al. (2020, p. 269); Mettler and Rohner (2009, p. 62) |
| Resilience in healthcare supply chains | The COVID-19 pandemic underscored the need for resilient buyer-supplier relationships to handle disruptions and maintain innovation in healthcare. | Mandal (2017, p. 1021); Spieske et al. (2022, p. 1); Zamiela et al. (2022, pp. 13-14) |

## 2.2 Skills and competencies needed to attract innovation in healthcare

Beyond the importance of a shared vision within the buyer-supplier relationship in the healthcare sector (Cannavale et al., 2022, p. 761; MacLeod et al., 2020, p. 269), buyers are also expected to actively attract and procure innovation. Procurement, in its broadest sense, encompasses any form of the buying process, including purchasing, leasing, renting, or acquiring supplies, services, or construction from external suppliers (Althabatah et al., 2023, p. 2).

In the healthcare sector, procurement falls under the umbrella of public procurement. Public procurement is when a public organisation (national, regional, local, or international) buys goods, services, or a combination of both, under a contract specifying the quantity and payment terms (Edquist & Zabala-Iturriagagoitia, 2020, p. 596). From a market perspective, public procurement opens opportunities for mobilising innovation while better achieving public policy goals and delivering improved services to citizens. However, a disadvantage is the strict national and EU-level regulations governing the implementation of public procurements (Torvinen & Ulkuniemi, 2016, p. 59).

Within the healthcare procurement sector, evolving themes continue to shape the priorities of public procurement professionals (PPPs). Key focus areas include sustainable procurement practices, efficiency, value for money, compliance, and innovation (Walker, 2015, p. 142). The growing emphasis on innovation sourcing, particularly from external sources, has created a need to develop specialised skills and competencies (Teece, 1986, p. 304). PPPs must be

equipped to effectively engage with external partners and leverage their contributions to drive innovation within healthcare systems.

While skills and competencies are often used interchangeably, a small but important difference exists. Competencies refer to a broader idea that includes the ability to use one's knowledge (Beske-Janssen et al., 2023, p. 2). Barnes and Liao (2012, p. 889) describes competencies as integrating knowledge, skills, and abilities linked to individual job performance. Le Deist and Winterton (2005, p. 39) categorised competencies into conceptual (cognitive, knowledge, and understanding) and operational (functional, psychomotor, and applied). Skills, a subset of competencies, focus on managing specific tasks (Mirabile, 1997, p. 75). Heckman and Kautz (2012, p. 451) classify skills into two categories: hard skills and soft skills. Hard skills involve technical capabilities such as operating equipment or software, whereas soft skills encompass personal attributes, goals, motivations, and preferences.

Procurement is part of Purchasing and Supply Management (PSM), and research into competencies within the PSM field is expanding. Organisations' functions within this field have shifted to a more human-centric discipline, where the human is strategically important (Stek & Schiele, 2021, p. 1). Various frameworks have been developed in the existing literature to classify competencies in the PSM field. Tassabehji and Moorhouse (2008, p. 59) identified five procurement competencies: technical skills, interpersonal skills, internal enterprise skills, external enterprise skills, and strategic business skills. Building on this, Bals et al. (2019, p. 3) explored the current and future competencies required in PSM, highlighting the emerging importance of competencies in digitalisation, innovation, sustainability, and interpersonal. Bals et al. (2019, p. 3) created a table of the top ten current and future competencies in the PSM field, which is shown in Table 2.

*Table 2: Overview top ten current and future competencies in the PSM field (Bals et al., 2019)*

| Current Competencies | Future Competencies |
| --- | --- |
| Analytical skills | Analytical Skills |
| Basic knowledge on PSM role & processes | Automation |
| Communication skills | Big Data Analytics |
| Cross-functional abilities & knowledge | Computer Literacy |
| Interpersonal Communication | eProcurement Technology |
| Negotiation | Holistic supply chain thinking |
| Stakeholder Relationship Management | Process optimisation |
| Strategic sourcing | Strategic Sourcing |
| Strategic thinking | Strategic thinking |
| Sustainability | Sustainability |

Several literature have explored the procurement competencies that contribute to innovation. Tassabehji and Moorhouse (2008, p. 59) explored the role of procurement in innovation from a skills-based perspective. Building on this perspective, Bals et al. (2019, p. 7) identified that innovation sourcing and innovative sourcing approaches have become integral additions to the list of procurement process skills. Furthermore, Stek and Schiele (2021, p. 11) have identified the profile of the innovation purchaser, which contains both hard skills, such as expertise in salesmanship, process and project management, as well as critical soft skills like imagination, creativity, inventiveness, and holistic thinking. Building on this, Picaud-Bello et al. (2024, p. 9)

created a list towards innovation and sustainability PSM competencies framework, where the innovation skills evolve around identifying business opportunities and implementing them through a series of activities.

The shift towards a more human-centric focus in the PSM field has led to a transition from operational tasks to strategic activities (Stek & Schiele, 2021, p. 5). Consequently, the required skills and competencies are evolving, giving rise to diverse types of purchasers within the PSM field, each occupying distinct roles tailored to these emerging demands. The concept of roles within the PSM field is interpreted in various ways. For instance, Mulder et al. (2005, p. 192) views roles as job profiles categorised by levels of responsibility, such as purchasing manager, buyer, assistant buyer, and senior buyer.

In contrast, Schiele (2019, p. 53) has further refined the conceptualisation of roles through the lens of strategic activities, leading to greater specialisation. Schiele (2019, p. 53) identified seven distinct purchasing roles that form the foundation of PSM role research: 1) operational procurement, 2) purchaser of direct material/serial purchaser, 3) purchaser of indirect material, 4) public procurement, 5) purchasing engineer, 6) Chief Purchasing Officer, and 7) other specialised roles such as purchasing controller, supply risk manager, and purchasing human resources agent. Building on this, Goldberg and Schiele (2020, p. 183) later added the role of innovation promoter, which focuses on enhancing innovation sourcing activities.

According to Delke (2022, p. 126), roles within the PSM field serve as conceptual tools to support organisational development and advance higher maturity levels. These roles enable the categorisation and structuring of related responsibilities, aligning each position with a distinct set of skills required to perform its duties effectively within a systematic framework. The scope of a role often reflects its level of specialisation, with larger organisations typically having more specialised roles, while smaller organisations tend to combine multiple responsibilities within fewer roles. Delke (2022, p. 128) also investigated which roles within PSM are likely to develop in the future, finding that roles will become increasingly specialised. Examples of these emerging roles include Data Analyst, Master Data Manager, Supplier Onboarding Manager, Process Automation Manager, System Innovation Scout, and Chief Happiness Officer.

The literature review emphasises the essential skills and roles required to effectively facilitate innovation acceptance, underscoring the vital contributions of suppliers. By directly addressing Sub-RQ2a and Sub-RQ2b, the analysis highlights both current and emerging competencies critical for success. This comprehensive framework provides a clear foundation for understanding the evolving responsibilities of professionals and driving meaningful innovation within the healthcare sector. These insights directly inform the research questions, offering actionable guidance on suppliers' pivotal role in shaping and supporting the innovation process.

## 2.3 Navigating the healthcare innovation landscape

Understanding the innovation process in healthcare is crucial to realising its potential benefits. This process involves navigating several stages before an innovation can be deemed successful. Various models have been proposed to delineate these stages. For instance, Varkey et al. (2008, p. 384) outline a six-stage process encompassing problem identification and idea generation, idea evaluation, development, first use, commercialisation, and diffusion. Cluley et al. (2022, p. 841) propose a four-stage problem identification, invention, adoption, and diffusion model. Similarly, Fleuren et al. (2004, p. 108) formulated a comprehensive framework for introducing and assessing innovation comprising four phases: dissemination, adoption, implementation, and continuation.

This study emphasises the framework of Fleuren et al. (2004, p. 108), focusing on the stages of the innovation process's dissemination, adoption, and implementation. According to Greenhalgh et al. (2004, p. 583), dissemination involves actively planned efforts to convince target groups to adopt innovation. For widespread success in innovation dissemination, Greenhalgh et al. (2004, pp. 601-604) identify several key facilitating elements, including network structure, opinion leaders, champions, boundary spanners, and formal dissemination programmes.

After the innovation is disseminated, it must be adopted into the systems and routines within an organisation. Adoption encompassed gathering and assimilating information about the innovation and making decisions regarding its usage (Fleuren et al., 2014, p. 501). Internal and external environments influence an organisation's openness to adoption of innovations (Becker & Whisler, 1967, p. 468). For example, organisational culture is an internal factor influencing adoption, while competition is an external factor that can encourage organisations to adopt innovations to remain competitive (Thakur et al., 2012, p. 564). In healthcare, three key factors influence an organisation's openness to adopting innovations: new technology, organisational characteristics, and the market environment (Thakur et al., 2012, p. 564).

Once an innovation has been adopted, it enters the implementation stage, where it is integrated into daily practice (Fleuren et al., 2014, p. 501). Existing literature offers various methods and frameworks for implementation, such as the plan-do-study-act method (Taylor et al., 2014, p. 290) or a framework to predict implementation outcomes (Chaudoir et al., 2013, pp. 3-4). A systematic review by Parmar et al. (2022, p. 864) provides several considerations for implementation development: research and information sharing, intentional implementation planning, organisational foundations, establishing the clinical context, and facilitation.

Understanding these stages of the innovation process highlights suppliers' critical roles in promoting user acceptance of innovations. By acting as facilitators at each stage—dissemination, adoption, and implementation—suppliers help bridge gaps between innovation development and its practical application, ensuring successful adoption and long-term integration within the extramural healthcare sector. This framework directly informs the research question: "Which roles do suppliers play in facilitating the user acceptance of

innovations among professionals in the extramural healthcare sector?'' This study underscores suppliers' essential role in driving successful acceptance by identifying specific supplier contributions throughout the innovation process.

## 2.4 Exploring types of innovation and acceptance of technology

### 2.4.1    Different types of innovations in healthcare

Flessa and Huebner (2021, p. 2) have categorised innovations into three main types: product, service and process innovation. Product innovations involve introducing new tangible goods or material products, where the challenge lies in the extended duration required for their development (Flessa & Huebner, 2021, p. 2). Service innovations focus on intangible goods, such as advice or consultation (Flessa & Huebner, 2021, p. 2). In addition to these two types, process innovation involves altering the production method for a product or service. Although the final output may remain unchanged, production or transformation processes are modified by adopting new technology or a new business model (Flessa & Huebner, 2021, p. 3).

Flessa and Huebner (2021, p. 3) suggest that these innovations can impact small subsystems, the entire system, or the overarching system, leading to a distinction between micro, meso, and macro innovations. At the micro-level, only the structures, processes, and paradigms of the doctor-patient relationship are affected, which involves stakeholders such as patients, doctors, nurses, and assistants. The meso-level includes all stakeholders, structures, methods, and paradigms within the healthcare sector, such as insurance companies, diagnostic and technology enterprises, accreditation boards, and the pharmaceutical industry. All stakeholders, structures, processes, and paradigms of society are involved on the macro level (Flessa & Huebner, 2021, pp. 3-4).

The Dutch healthcare sector is undergoing a significant shift in its approach to service delivery, impacting the meso-level. This transition involves moving away from primarily providing care within hospital settings (intramural) towards delivering care in patients' home environments (extramural) (Tummers et al., 2013, p. 2827; van Iersel et al., 2019, p. 2). As a result, patients are experiencing increased empowerment and control over their care, indicating a transition towards more patient-centred healthcare. Patient-centred care involves effective collaboration among HCPs, patients, and the families of patients, with the primary objective of understanding the patient's values and preferences (Heijsters et al., 2022, p. 1). Exchanging information and communication between HCPs and patients in extramural settings is crucial, with innovations playing a pivotal role in facilitating this exchange (Heijsters et al., 2022, p. 1).

Facilitating the exchange of information and communication, diverse innovations are developed such as mobile health (m-health) apps (Nouri et al., 2018, p. 1089), telemedicine services (Biancone et al., 2023, p. 1), computerised physician order entry (CPOE) (Nuckols et al., 2014, p. 2), and electronic health records (EHR) (Heath & Porter, 2019, p. 21). All these innovations are known as Health Information Technology (HIT) (Iyanna et al., 2022, p. 151). HIT holds substantial potential to transform healthcare delivery by reducing diagnostic errors, improving

efficiency and effectiveness, lowering costs, and ultimately enhancing patient care (Lluch, 2011, pp. 857-859).

Within HIT, mHealth apps leverage wireless communication devices to strengthen public health initiatives (Nouri et al., 2018, p. 1089). Designed to engage patients and positively influence their behaviours actively, mHealth apps can potentially improve health outcomes for various conditions, including diabetes, obesity, cancer, and pregnancy (Nouri et al., 2018, p. 1089). HCPs also rely on mHealth apps to carry out essential duties, including patient management, medical references and research, diagnosing medical conditions, health records, medical education and consulting, information gathering and processing, patient monitoring, and clinical decision-making (Nouri et al., 2018, p. 1090; Yasini & Marchand, 2015, pp. 177-178). While mHealth apps have the potential to impact health outcomes, there are valid concerns regarding the selection of appropriate apps, as well as their privacy, security, and limited control over their quality. (Nouri et al., 2018, p. 1090).

Beyond mHealth apps, another HIT innovation is telemedicine, which can be described as telecommunications technologies that HCPs can use to increase home healthcare, obtain diagnoses, and monitor patient care (Biancone et al., 2023, p. 1). Khodadad-Saryazdi (2021, p. 3) identified specific characteristics of telemedicine: tele-consultation, tele-expertise, tele-monitoring, Tele-assistance and tele-emergency. The significance of telemedicine was particularly highlighted during the COVID-19 pandemic when physical movement and access to healthcare facilities were restricted (Biancone et al., 2023, p. 2).

CPOE is a comprehensive system that enables HCPs to electronically input and manage medication, tests, and other service orders (Nuckols et al., 2014, p. 2). This system offers opportunities to reduce medical errors, enhance patient safety, streamline workflow efficiency, and elevate the quality of care by providing readily accessible and relevant patient information and clinical data (Rahimi et al., 2009, p. 605). EHRs, on the other hand, serve as centralised digital repositories of patient health information (Kazley & Ozcan, 2007, p. 375). These web-based platforms consolidate patient-specific clinical data from various sources, enabling seamless information exchange across diverse healthcare settings (Kazley & Ozcan, 2007, p. 375). These benefits contribute to a more efficient healthcare system with the potential to enhance access to affordable care and reduce administrative burdens for HCPs.(Hossain et al., 2019, p. 77).

### 2.4.2 Acceptance of technology in healthcare

Technology acceptance involves an individual's willingness to make a favourable decision to adopt and utilise an innovative solution (Taherdoost, 2018, p. 961). It delves into the psychological state of potential users, particularly their intention to engage with a specific technology (Alqudah et al., 2021, p. 1). Existing literature has yielded several theoretical frameworks to understand individuals' willingness to accept various technologies (Taherdoost, 2018, p. 961). The most well-known theoretical frameworks are the Technology acceptance

model (TAM), the Extension of the TAM (ETAM), and the Diffusion of Innovation Theory (DOI) (Taherdoost, 2018, p. 961).

The TAM posits that user motivation is primarily driven by three key factors: perceived usefulness, perceived ease of use, and attitude towards use (Taherdoost, 2018, p. 963). Furthermore, cultivating a positive attitude towards technology within an organisation can significantly enhance employees' intentions to use it (Thakur et al., 2012, p. 563). ETAM builds upon the TAM to improve its adaptability, explanatory power, and specificity. It incorporates additional factors, such as social influence and cognitive factors, to provide a more comprehensive understanding of technology acceptance (Taherdoost, 2018, p. 963). In contrast to the TAM and ETAM, the DOI views innovation as a process influenced by both the innovation itself and the capacity for change within a system (Thakur et al., 2012, p. 563). The DOI emphasises system characteristics, organisational attributes, and environmental aspects, offering a broader perspective on technology adoption. However, it may have less explanatory power when examining individual-level acceptance than the TAM and ETAM (Thakur et al., 2012, p. 564).

In healthcare settings, as HCPs become more familiar with a specific technology, HCPs are more likely to perceive it as valuable and easy to use, thereby reducing fear and uncertainty and promoting its adoption (Thakur et al., 2012, p. 563). However, HCPs sometimes resist new technologies like HIT, making persuading them of its ease of use and usefulness challenging. Resistance can manifest in various areas, which prior literature has identified as organisational, technological, professional, and patient-related barriers(Iyanna et al., 2022, p. 151).

Previous studies have linked organisational resistance factors to HCPs' resistance, often stemming from changes in workflow and organisational issues (Iyanna et al., 2022, p. 151). Further research has associated these workflow concerns with the extra time required by HCPs to integrate technology, leading to productivity challenges (McAlearney et al., 2013, pp. 5-6; Yu et al., 2013, p. 785). Studies have highlighted several specific organisational barriers that hinder technology adoption, including a lack of adequate training and established routines (Hossain et al., 2019, p. 83), deficient IT support (McAlearney et al., 2013, p. 6), and inadequate infrastructure (Ser et al., 2014, p. 6).

Technical resistance can also hinder the adoption of HIT (Iyanna et al., 2022, p. 152). Barriers contributing to this resistance include system functionality challenges (Heath & Porter, 2019, p. 30), the complexity of HIT (De Wit et al., 2019, p. 10), and the mismatch between technology and the logic of care (Plumb et al., 2017, p. 56). Moreover, the rapid evolution of healthcare technology necessitates a strong emphasis on patient privacy. While HIT offers significant potential, technological resistance may arise due to concerns over data privacy and security (Sarradon-Eck et al., 2021, p. 7).

Beyond organisational and technological barriers, individual HCP characteristics and professional differences can also influence HIT adoption (Iyanna et al., 2022, p. 152). Existing literature has identified diverse factors contributing to individual and professional differences

in the resistance to technology, including personal innovativeness (Beglaryan et al., 2017, p. 58), variations in technology usage based on gender and age (Baudin et al., 2020, p. 7), and distinctions related to profession and speciality (Cresswell et al., 2017, pp. 1950-1951).

The literature highlights the critical role of involving HCPs in the innovation process to develop solutions that truly meet their needs and those of patients. According to van Houwelingen et al. (2024, p. 2) involving HCPs is essential for developing effective and practical innovations. The study identifies 16 skills that enable HCPs to participate in this process effectively. Among these skills, transferring enthusiasm and recruiting colleagues, effectively conveying the necessity and potential of new healthcare technologies, are crucial (van Houwelingen et al., 2024, p. 6). Additionally, out-of-the-box thinking, creativity, collaboration within project groups, and adaptability are precious skills for HCPs engaged in innovation (van Houwelingen et al., 2024, p. 6). Beyond these skills, the study also highlights 18 necessary attitudes, the most critical being active participation in the process, enthusiasm, intrinsic motivation, curiosity, and critical thinking (van Houwelingen et al., 2024, p. 6).

To effectively address the main research question ''Which roles do suppliers play in facilitating the user acceptance of innovations among professionals in the extramural healthcare sector?'', it is crucial to understand the different types of innovations and the key factors influencing their acceptance. A clear understanding of these essential aspects provides the foundation for analysing how suppliers can overcome barriers and drive the adoption of innovations. Table 2 offers a detailed overview of the key dimensions that impact the acceptance of HIT, serving as a valuable reference for understanding the intricate interplay between innovation types and user acceptance dynamics.

*Table 2: Dimensions influencing HIT acceptance in healthcare*

| Dimension | Description | Source |
|---|---|---|
| Organisational resistance | Resistance often stems from changes in workflow and organisational issues | Iyanna et al. (2022, p. 151) |
| | Productivity challenges are due to the extra time needed for technology integration | McAlearney et al. (2013, pp. 5-6); Yu et al. (2013, p. 785) |
| | Barriers include a lack of training, IT support, and infrastructure | Hossain et al. (2019, p. 83); Hossain et al. (2019); McAlearney et al. (2013, p. 6); Ser et al. (2014, p. 6) |
| Technology resistance | Resistance from system complexity, functionality issues, and care-technology mismatch | Heath and Porter (2019, p. 30); Iyanna et al. (2022, p. 152); Plumb et |

| | | al. (2017, p. 56); De Wit et al. (2019, p. 10) |
|---|---|---|
| | Concerns over data privacy and security | Sarradon-Eck et al. (2021, p. 7) |
| Profession and personal differences in resistance | Personal innovativeness | Beglaryan et al. (2017, p. 58) |
| | Distinction related to profession and specialty | Cresswell et al. (2017, pp. 1950-1951) |
| | Variation technology based on gender and age | Baudin et al. (2020, p. 7) |
| | importance of involving HCPs in the innovation process | van Houwelingen et al. (2024, p. 2) |

## 3. Methodology

### 3.1 Research design

The study focuses on a qualitative research approach to uncover individuals' meanings, interpretations, and experiences about suppliers' role in facilitating the acceptance of innovations by extramural HCPs in the healthcare sector. Qualitative research is divided into preparation, implementation, and follow-up phases (Bals et al., 2019, p. 8). This study has adopted the same three-phase structure to ensure systematic data collection and analysis.

#### 3.1.1 Methodology

The preparation phase of this study centres on selecting the most appropriate research methodology. To comprehensively understand suppliers' roles in supporting innovation acceptance among HCPs, this study adopts a qualitative approach. This method aims to understand and explain the complexities of human behaviour and relationships (Queirós et al., 2017, p. 370). Focusing on the non-quantifiable aspects of reality enables a comprehensive exploration of the relational dynamics and the factors that influence them (Queirós et al., 2017, p. 370). On the other hand, quantitative research emphasises objectivity and is particularly suitable when collecting measurable data on variables and drawing inferences from population samples is possible (Queirós et al., 2017, p. 370). However, a qualitative approach is more appropriate since this study investigates complex, context-specific phenomena such as the roles of suppliers, innovation, and acceptance. It provides the depth and flexibility needed to capture nuanced perspectives and explore the underlying social and relational dynamics that quantitative methods may overlook.

Qualitative research can be conducted using observations, case studies, focus groups, ethnography, field research, structured interviews, and in-depth interviews (Queirós et al., 2017, p. 374). Among these, Semi-structured interviews are chosen for their ability to provide in-depth data and explore emerging themes thoroughly (Jamshed, 2014, pp. 87-88). This method allows the interviewer to guide the conversation using open-ended questions while

maintaining flexibility to pursue insightful tangents and ask relevant follow-up questions (Jamshed, 2014, pp. 87-88). This approach enables a rich, contextualised understanding of the suppliers' roles, allowing for deeper insights into how suppliers support the acceptance process within the extramural healthcare sector.

### 3.1.2 Semi-structured interview guide

A semi-structured interview guide is essential for ensuring reliable and comprehensive data collection during semi-structured interviews (Maxwell, 2008, pp. 336-337). The guide provides a structured framework that ensures coverage of all topics while allowing for flexibility and adaptation based on the interviewee's responses. Table 3 presents the interview guide, outlining each section's key topics and questions.

*Table 3 Semi-structured guide*

| Interview guide part | Content |
|---|---|
| 1. Opening interview | The researcher introduces themselves to the participant and provides information about the confidentiality of the interview. |
| 2. General information | General data about the participants' gender, age, function, company, and phases in career. |
| 3. Introduction | Information about the goal of the interview. |
| 4. Supplier involvement in healthcare | The role of suppliers in innovations in the extramural environment, the definition of innovation, and the relationship between supplier and extramural employee in healthcare. |
| 5. Navigating the healthcare innovation landscape | The dissemination of innovation within extramural healthcare, the obstacles encountered, and the role of procurement. |
| 6. Acceptance of innovations in healthcare | A deeper understanding from suppliers' perspective regarding why innovations are accepted or not, as well as external factors playing a role. |
| 7. Ending | After the interview, they expressed gratitude for their time and offered to address any uncertainties. |

### 3.1.3 Interview protocol

During the preparation phase, the semi-structured interview guide serves as the foundation for developing a detailed interview protocol. This protocol functions as a roadmap for conducting the interviews, outlining the specific questions to be asked, potential follow-up questions, and any guidelines or instructions for the interviewer (Castillo-Montoya, 2016, p. 813). According to Rabionet (2011, p. 204), two crucial components exist in developing an interview protocol. First,

it includes a concise introduction to the participants. The introduction contains details about the interview's purpose, duration, confidentiality, consent, and the intended use of the collected data. A written consent form (Appendix 1) was prepared for this study to ensure that participants clearly understood these components. Participants signed the form to indicate their agreement with the terms and to provide permission for their involvement. Following the introduction, the second component involves formulating the questions. The open-ended questions are grouped based on the literature topic, following a specific order (Rabionet, 2011, p. 204). The interview protocol is available in Appendix 2.

## 3.2 Empirical research: unit of analysis, data collection, data analysis

### 3.2.1   Unit of analysis

The target group for this study consists of three key stakeholder groups within the Dutch extramural healthcare sector. The first group consists of HCPs who directly or indirectly work in extramural healthcare and are involved in delivering healthcare services. These HCPs provide valuable insights into the current landscape of innovation acceptance and can help identify potential strategies to facilitate greater adoption. Participants who frequently engage with innovation as part of their daily responsibilities were selected for interviews due to their experience, knowledge, and ability to provide valuable and relevant insights for the study. Those with less experience were excluded from participation to ensure the focus remained on individuals with a deeper understanding of innovation processes.

The second group includes a homecare procurement specialist who comprehensively understands the buyer-supplier relationship and offers valuable insights into the interaction dynamics between buyers and suppliers. Finally, the third group comprised suppliers actively developing and offering innovative products, technologies, and solutions specifically designed for the extramural healthcare sector, focusing on health information technology. Suppliers provide insights on adoption challenges, implementation strategies, and collaboration.

A multi-pronged approach was utilised to recruit diverse and experienced participants. This involved attending a healthcare and innovation event to invite potential participants directly. Additionally, an online search identified suitable participants from relevant organisations, who were contacted via phone or email and invited to participate in the study. This strategy ensured the inclusion of participants with appropriate knowledge and experience.

The information provided in Table 4 offers an overview of the sample. To maintain anonymity, each respondent has been assigned a letter; allowing their comments during the interviews to remain identifiable without revealing their identity. The interviews included participation from five men and six women, ranging from 27 to 56 minutes. On average, the interviews lasted approximately 35 minutes.

*Table 4 Sample overview*

| Respondent ID | Unit of analysis | Age | Gender | Education level | Interview duration |
|---|---|---|---|---|---|
| R1 | HCP | 31 | Male | HBO | 34 min |
| R2 | HCP | 36 | Female | MBO | 27 min |
| R3 | HCP | 31 | Male | HBO | 30 min |
| R4 | HCP | 54 | Female | MBO | 34 min |
| R5 | Supplier | 42 | Female | WO | 37 min |
| R6 | Supplier | 54 | Male | WO | 56 min |
| R7 | Supplier | 62 | Male | WO | 35 min |
| R8 | Supplier | 26 | Male | HBO | 37 min |
| R9 | Supplier | 25 | Female | WO | 38 min |
| R10 | Supplier | 54 | Female | MBO | 33 min |
| R11 | Procurement Specialist | 33 | Female | WO | 32 min |

### 3.2.2 Data collection

Eleven semi-structured interviews were conducted, nine held online via Microsoft Teams and two in person. All interviews were recorded to produce transcripts. Initially performed in Dutch, the transcripts were transcribed in the same language and later translated into English to facilitate data analysis. The translations underwent a thorough review to ensure the accuracy and nuance of the original Dutch responses were preserved, guaranteeing that no critical information was lost during the process. The translation platform DeepL was utilised to facilitate the translation from Dutch to British English. Semi-structured interviews provided continuous questioning, allowing the researcher to gather as much data as possible. This approach enabled the researcher to understand the participants' perspectives comprehensively Legard et al. (2003, p. 152) highlighted.

Coordinating participant availability presented a challenge, as participants had to make time outside their demanding schedules to take part in the study. However, the relevance and timeliness of the research topic encouraged participants to engage, recognising its potential impact on the extramural healthcare sector.

Data saturation, the point at which no new themes or insights emerge from the data, was reached after eleven interviews. Saturation was assessed by closely monitoring the emergence of themes across interviews. By the eleventh interview, no novel themes or new insights were identified, indicating sufficient data had been collected to achieve saturation. This approach ensured that the data collected were comprehensive and representative of the perspectives needed to address the research question.

### 3.2.3 Data analysis

The research used a deductive approach to study collected data and investigate specific aspects of the analysed phenomenon (Graneheim et al., 2017, p. 30). In the follow-up phase, the

interview transcripts are analysed. The transcripts contained a substantial volume of raw data, and the Gioia method was utilised to extract meaningful insights from it. The method systematically codes and analyses textual data to identify themes, categories, and dimensions. The transcripts were coded using Atlas.ti.24. The Gioia method prioritises rigour and transparency in the analysis process, ensuring that findings are grounded in the data and contribute to advancing knowledge in the field (Gioia & Chittipeddi, 1991, p. 435). The Gioia method involves a systematic research approach, beginning with the initial coding of pertinent phrases or sentences directly related to the research question, also known as first-order codes (Gioia & Chittipeddi, 1991, p. 435). The study had three units of analysis. Each underwent independent initial coding.

The core research question, which investigates the role of suppliers in facilitating user acceptance of innovations, necessitates a detailed exploration of their specific contributions. Using the Gioia method, the study first establishes a clear understanding of innovation within the context of extramural healthcare. This foundation enables an in-depth analysis of sub-questions 1a and 1b, focusing on suppliers' current contributions and potential enhancements to the innovation process. Additionally, the Gioia method aids in defining the concept of acceptance, providing insights for addressing sub-questions 2a and 2b. Through this approach, the identified themes and dimensions provide a comprehensive view of supplier roles, capturing their influence and potential future impact on innovation acceptance in extramural healthcare settings.

Initially, 197 first-order codes were generated. These codes were then compared and consolidated across three units, resulting in 26 first-order codes. The finalised set of first-order codes is available in Table 5. The 26 first-order codes were further organised into second-order themes based on common characteristics. These second-order themes offer a more theoretical and interpretive perspective, enriching the depth of data comprehension (Gioia & Chittipeddi, 1991, p. 435). In total, eight second-order themes were established and are also listed in Table 5. Each theme is connected to a minimum of three first-order concepts. The final step of the Gioia method involves aggregating dimensions based on these themes. The aggregate dimensions represent the highest level of abstraction in the data analysis process (Gioia & Chittipeddi, 1991, p. 435). The second-order themes were clustered, and three aggregate dimensions were created. The aggregate dimensions are holistic care innovation, collaborative relationships, and attitudes towards innovation adoption. Table 5 provides an overview of the data structure based on the Gioia method.

*Table 5 Data structure based on the Gioia method*

| First–order concepts | Second–order themes | Aggregate dimension |
|---|---|---|
| Innovation mainly changes and supports work processes | Work process transformation | Holistic care innovation |
| Innovation leads to the customer thinking differently about work processes | | |
| Innovation means renewal in processes | | |
| Innovation allows to shape better care | Extramural care innovation | |
| Innovation can take over care of moments | | |
| Replace light care for innovation, giving more space. | | |
| innovation lies in areas: home monitoring, daily structure and medication support, and video calling | | |
| It is all about self–direction | Self-direction and empowerment | |
| Self-direction means HCPs must check more instead of giving care | | |
| Innovative thinking is looking to medical necessity, not the client wishes | | |

| First–order concepts | Second–order themes | Aggregate dimension |
|---|---|---|
| Close collaboration, especially in the implementation phase | Collaboration engagement supplier | Collaborative relationship |
| Trust, allowing space and opportunity for each other | | |
| Intensive collaboration in the beginning | | |
| Delving into the work processes side of healthcare organisation | | |
| Factors like mission and vision contribute to success | Collaboration engagement EHCO | |
| Due to TA, knowledge in-house | | |
| The skills of the TA | | |
| The significance of care coordination transitions is expected to increase | Criteria relationship | |
| The critical aspect is ensuring that innovations are simple and easy to understand | | |

| Costs, openness, and transparency important criteria | | |
|---|---|---|

| First–order concepts | Second–order themes | Aggregate dimension |
|---|---|---|
| The early adoption of innovation within small groups is crucial | Innovation adoption | Attitudes Towards Innovation Adoption |
| Encouraging the sharing of positive experiences | | |
| Significant time and resources must be dedicated to successfully adopting innovation | | |
| Resistance must have an underlying cause | Resistance against innovation adoption | |
| Approach it more softly and involve people from within the organisations, with us as advisors | | |
| Resistance to innovation adoption can also be influenced by age | | |

# 4. Results

In the following section, Table 5 will be described in depth. The results are organised into paragraphs based on the aggregate dimensions from Table 5, with each paragraph explaining the underlying themes and concepts.

## 4.1 Holistic innovation ecosystem

### 4.1.1 Work process transformation

This research reveals participants' diverse understanding of "innovation". Some participants define innovation through practical application, such as using new methods for efficiency *"innovation involves using new methods to execute tasks more innovatively and efficiently"*(R2). Other participants perceive innovation simply as an improvement, stating that *"innovation is an improvement"*(R8). However, a recurring sentiment in extramural healthcare emphasises the impact on work processes: *"Innovation primarily brings about changes in work processes and supports them"*(R1). Participants' observations further illustrate that conversations about digital possibilities can spark new thinking among customers and drive changes in their approach to work: *"Innovation takes place by conversing with customers and telling them about digital possibilities"*(R5). This perspective is reinforced by observations that innovation mainly changes and supports work processes, and innovation leads to customers thinking differently about work processes. These insights suggest that innovation reshapes tasks and shifts mindsets surrounding work practices. Additionally, some participants view innovation as *"Innovation is anything new and different from before"*(R3). This perspective emphasises that innovation means renewal in processes, where new methods, improved workflows, or digital solutions continuously renew existing practices.

Ultimately, these perspectives support the second-order theme of work process transformation, where innovation is seen as an ongoing, dynamic force that introduces new tools and methods and fundamentally redefines work processes to support HCPs in delivering care more effectively.

### 4.1.2 Extramural care innovation

The transformative potential of innovation in extramural healthcare is particularly evident in its ability to reshape care practices, allowing HCPs to focus on tasks that require direct human intervention. By leveraging innovation to manage less demanding care tasks, HCPs can dedicate more time and attention to patients with complex care needs. One participant explained this shift noting, *"How can you take over work through innovation, creating space for the needed physical care"*(R1)?

Innovation in extramural healthcare focuses on replacing lighter care tasks to create more space for complex care. As observed by one participant, *"I think innovation in extramural care mainly lies in areas like home monitoring, daily structure support, medication support, and video calling"*(R8). Based on these insights from participants, extramural care innovation was identified as a second-order theme because it captures the overarching trend of using technology to optimise and support care in community and home-based settings. This aligns

with participants' observations on enhancing efficiency and enabling HCPs to concentrate on more complex care needs.

### 4.1.3   Self-direction and empowerment

In addition to enhancing efficiency, these innovations empower patients by fostering greater autonomy in managing their care. Participants noted that these innovations are *"the primary things you see now to enable clients to live at home longer, with more control over their care"*(R8). This focus on increasing patient self-reliance is evident in observations such as *"It is all about self-direction"*(R1) and *"The starting point is the client's self-reliance"*(R3). This emphasis on self-direction points to a shift towards encouraging patient independence, with innovations designed to support clients in making informed choices about their care. However, there must be an awareness that innovative thinking prioritises medical necessity over patient preferences. One participant noted: *"Innovative thinking involves looking at medical necessity rather than client wishes"*(R3). This suggests a need to balance the drive for innovation with considering patient preferences and promoting true self-direction.

The shift towards greater self-direction for patients also means a possible change in the role of HCPs. Participants noted that HCPs may need to transition from hands-on caregiving to roles focused on oversight and decision-making, as described in the comment, *"Self-direction means employees have to check more instead of giving care"*(R3). This shift indicates a change in healthcare work, where HCPs increasingly monitor and support patients' choices rather than providing direct care.

This collective shift in care dynamics from direct provision to a more supervisory role led to identifying self-direction and empowerment as a second-order theme. This theme captures the overarching trend of empowering patients to take control of their care while adjusting the responsibilities of HCPs to support better autonomous living.

### 4.1.4   Overall conclusion

The aggregate dimension of a holistic care innovation ecosystem emerged from synthesising the three second-order themes—work process transformation, extramural care innovation, and self-direction and empowerment. These three themes illustrate a comprehensive shift toward an integrated approach to care innovation. Innovation is not merely about introducing new technologies or improving efficiency in isolation. Instead, it involves fostering an interconnected ecosystem that incorporates the transformation of work processes, the expansion of extramural care through technology, and the empowerment of patients to take an active role in their care. This holistic care innovation ecosystem captures the broader vision of an extramural healthcare system where innovation operates as a cohesive, dynamic force, promoting efficiency, adaptability, and patient-centred care across different settings.

## 4.2 Collaborative relationship

### 4.2.1    Collaborative supplier engagement

Effective innovation facilitation in EHCOs requires collaborative efforts from suppliers to address the complexities and uncertainties of implementation. Within these collaborative efforts, trust, giving each other space, and the opportunity to work together are crucial aspects, as highlighted by one participant: *"Every collaboration begins with some kind of basis of good trust and giving each other the space and opportunity to do it together, to create customised work for an organisation together"*(R3). From these aspects, open communication between the EHCO and the supplier proves essential for innovative problem-solving, ultimately leading to tailor-made solutions tailored to the specific needs of the EHCO.

Suppliers and EHCOs work closely together, particularly in the early stages of collaboration, to develop a shared understanding of work processes, challenges, and user needs. As one participant noted: *"Back then, we also had contact points where we sat down together monthly and asked questions about how the implementation was going, what we were running into, and what we still needed. So, it was really intensive in the beginning. The same applied to the other partners. They were very involved through training and coaching"* (R3). This intensive initial phase involves suppliers investing time to gain in-depth insights into each EHCO operation. Conducting on-site visits, asking clarifying questions, sharing information about the innovation, and discussing its potential applications within the organisation's existing framework are all part of this process. Through these close interactions, suppliers understand and help shape the implementation process by providing structured support, such as training, coaching, webinars, or e-learning, to ensure that HCPs can effectively use the new technology. This proactive involvement, especially in the early phases, helps reduce the time and costs associated with implementation, addressing the growing demand for care with limited resources.

Suppliers who can quickly comprehend their role, adapt to changing needs and circumstances, and effectively oversee the implementation process can make serious contributions to the innovation process between the EHCOs. In doing so, suppliers ensure that all stakeholders involved in the innovation process are contacted and included from the outset, which is important for the success of the collaboration. As participants noted, *"Many innovations stumble because the customer is brought into the process too late"*(R9). The lack of involvement from even one critical stakeholder, particularly in the early stages, can disrupt the process.

By understanding the work processes, challenges, user needs, and stakeholders, suppliers can develop tailored implementation plans for innovations in EHCOs. Within these plans, suppliers guide EHCOs on effectively using the innovation. Additionally, suppliers can help EHCOs identify the most suitable clients for the innovation. In doing so, suppliers provide valuable information and insights that clarify the specific client needs the innovation can address. This support empowers EHCOs to make more informed decisions about implementing innovations in their care services, ultimately ensuring the innovation benefits those who need it most. As one participant noted: *"Suppliers help us select our client base, which clients are suitable for the*

*technology and why, giving additional information and reasoning for trying to deploy the technology''*(R3).

Beyond this initial client identification and selection, suppliers can further support EHCOs by leveraging data analytics to monitor the efficacy of implemented innovations. As one participant noted, *"Suppliers contribute by, for example, helping us with analytics to see what it does and what can be effective for us''*(R3). Suppliers can offer valuable insights and recommendations by analysing the gathered data to help EHCOs optimise their operations and generate better client outcomes.

When an EHCO adopts innovation, the role of its suppliers is altered. While direct communication continues, the level of interaction decreases, and the EHCO becomes responsible for disseminating the innovation further. One participant noted: *"For now, the supplier supports us with the technology. They are watching remotely to monitor how things are going and if there is something they can step into''*(R1). Consequently, the supplier may help whenever required, such as in the event of issues, or may be contacted directly by phone, email, or internet. Maintaining close communication, establishing clear agreements and expectations, and ensuring mutual awareness of developments are critical for collaboration between the EHCO and its suppliers.

The second-order theme, collaborative engagement with suppliers, refers to the close, trust-based partnerships between suppliers and EHCOs to facilitate the effective implementation of innovations. This collaboration involves open communication, a shared understanding of work processes, and proactive involvement from suppliers, especially in the initial phases. By establishing trust and allowing space for each party's contributions, suppliers and EHCOs can address complex implementation challenges, create customised solutions, and ensure the innovation aligns with the unique needs of the EHCO. The collaboration extends into training, coaching, and data-driven feedback to support continuous improvement and optimise client outcomes.

### 4.2.2 Collaborative engagement EHCO

EHCOs must play an active role in effectively implementing innovation. As one participant noted, *"We can push as much as we want, but if the healthcare organisation itself doesn't see it, it won't happen''*(R9). EHCOs need a clearly defined mission and vision, well-established workgroups, and adequate staffing. As one participant noted, *"There needs to be a desire, a vision, and a mission behind it, and then communicate this to the employees''*(R9). This clear sense of purpose ensures that any innovation aligns with the EHCOs' overall objectives and provides a roadmap for implementation. By having a well-communicated mission and vision, EHCOs can inspire a shared commitment to innovation, making it easier to integrate new technologies.

In addition, EHCOs should establish dedicated workgroups to provide structure and accountability, enabling a smooth implementation process. These groups, comprising motivated and skilled personnel, foster a sense of ownership over the innovation, which is

crucial for effective adoption. Adequate staffing ensures that innovation tasks are managed efficiently and potential challenges promptly addressed.

Within the extramural healthcare, a group of knowledgeable and motivated TAs exists. These individuals are enthusiastic about innovation, eager to experiment with new technologies, and committed to disseminating their knowledge and experience to their colleagues. One participant noted, *"Tech ambassadors were deployed to explain the innovations and see where technology could be linked"*(R4). TAs play a crucial role in facilitating the implementation of innovative technologies and promoting their adoption among other personnel. TAs connect the innovative supplier and the HCPs, ensuring seamless communication and providing valuable insights, feedback, and knowledge transfer. Their value to suppliers lies in their ability to facilitate the implementation process and ensure that innovative solutions are effectively integrated into the healthcare system. The enthusiasm of TAs for innovation is a crucial advantage, as they are passionate about exploring new technologies, thus saving suppliers the effort of trying enthusiasm them. As technology continues to evolve, it is vital to have advocates who can effectively communicate its benefits and alleviate any concerns within the workplace. These individuals adeptly promote emerging technologies while addressing any potential issues.

TA need specific skills to facilitate the connection between the innovative supplier and the extramural healthcare personnel. These skills include a basic technical understanding of how innovations work, but it is not mandatory to possess an in-depth knowledge of the specific technology behind the innovation. More importantly, are the soft skills. Firstly, TA must display enthusiasm for innovation, genuine excitement for exploring new technologies, and a willingness to learn.

Additionally, the ability to enthuse others about innovation is crucial. This requires strong communication skills, as the ambassador must effectively convey the benefits of the innovation in a manner that resonates with staff. Strong leadership skills are equally essential: TAs must motivate and inspire others to embrace change. At the same time, it is also necessary to consider the interests of the extramural personnel, as change always comes with resistance, and empathy is a critical component of practical leadership skills.

Furthermore, TAs must possess adaptability. During the initial stages of innovation implementation, the solution may not immediately meet stakeholder requirements or expectations, necessitating changes. TAs need to be adaptable, open to experimenting with different technologies, and possess strong problem-solving skills to address challenges that arise during implementation.

Effective communication and networking skills are also crucial for TAs. Building and maintaining strong relationships with both the suppliers and extramural HCPs is key to providing valuable feedback and insights. As one participant noted, suppliers recognise the need to simplify technology implementation for HCPs: *"You do not want the healthcare workers to need many skills"*(R8). This approach ensures that innovations can be integrated into extramural healthcare

settings with minimal disruption and training requirements. Consequently, TAs, with their knowledge and skills, are essential for bridging the gap between complex technologies and the end-users.

The second-order theme, collaborative engagement by EHCOs, refers to the active, structured involvement of EHCOs within the innovation process. EHCOs establish a clear mission and vision to guide their innovation efforts, form dedicated workgroups to provide structure and accountability and engage TAs with technical and interpersonal skills. TAs bridge the gap between suppliers and healthcare personnel, promoting new technologies and facilitating effective communication and knowledge transfer. By leveraging these elements, EHCOs can effectively support and sustain innovation within their organisations.

### 4.2.3   Criteria relationship

When collaborating with innovative suppliers, EHCOs need to consider specific criteria for a relationship that determines the effectiveness and sustainability of these collaborations. Before assessing the supplier's innovativeness and potential contribution, evaluating the type of innovation, its intended purpose, and its benefits to HCPs is crucial. Given the labour-intensive nature of extramural care, the supplier's ability to simplify care processes is critical. In this regard, it is essential to ensure that the innovation is focused on improving the quality of care.

The importance of care coordination and transitions is expected to increase, emphasising the need for innovations that prioritise this aspect. As one participant noted, *"Extramural care institutions are trying to work better together within their region and keep care manageable. Care coordination within the area will be the most critical issue in the coming years. Reducing the pressure is almost impossible, but I think the key is improving how they work together to cope with the growing demand for care with few HCPs"*(R5). Suppliers need to understand the importance of seamless care coordination and transition for effective collaboration. EHCOs can ensure that their partnerships contribute to an integrated healthcare approach by prioritising care coordination as a criterion.

Another key criterion is simplicity. Innovations must be easy to understand and use, especially for HCPs, who are the primary end-users. As one participant said: *"You do not want the healthcare workers to need many skills"*(R8). By designing user-friendly innovations, suppliers can ensure that HCPs can adapt quickly without extensive training, which allows them to focus on patient care rather than navigating complex systems. Simplicity in design supports smooth implementation and reduces the potential for errors, enhancing both patient outcomes and HCP satisfaction.

Financial considerations are critical and significantly impact the relationship between healthcare organisations and suppliers. Innovations often require substantial supplier investment, and their success may rely on insurance coverage. As one participant noted, *"The health insurer also adheres to this because it determines innovation in healthcare as they have to pay for it"*(R6). This dependence on insurance coverage means that financial arrangements need to be apparent from the start, especially concerning who bears the costs once an

innovation moves beyond the pilot phase. Clear financial criteria prevent unexpected patient expenses and ensure that only viable, cost-effective innovations are implemented.

Lastly, openness and transparency are essential criteria in the relationship. As one participant noted: *''What is important to me is openness and transparency''*(R4). Openness encourages clear communication and trust between parties, fostering a collaborative environment where issues can be openly discussed and resolved. This is especially important in the early stages of the innovation process, where there are still many uncertainties about the innovation and its implementation. Openness allows both the supplier and EHCO to come up with their ideas, concerns, and feedback. Transparency ensures that all stakeholders have access to relevant information, promoting accountability and preventing misunderstandings. When information is readily available and easily understood, it facilitates informed decision-making and builds confidence in the relationship. Moreover, openness and transparency help manage expectations effectively. One participant noted: *''If expectations are not clear, it usually goes wrong''*(R4). Discussing goals, timelines, and potential challenges allows suppliers and healthcare organisations to align their expectations and work towards common objectives.

The second-order theme criteria for relationship refers to the essential factors EHCOs consider when establishing partnerships with innovative suppliers. This theme encompasses key criteria, including care coordination and transitions, simplicity of innovations, financial considerations, and openness and transparency. These criteria help ensure that collaborations are effective, sustainable, and aligned with the operational needs of EHCOs. By prioritising these aspects, EHCOs can create partnerships that introduce useful innovations and support integrated care delivery, facilitate ease of use for HCPs, establish clear financial terms, and foster a trusting, transparent relationship with suppliers.

### 4.2.4   Overall conclusion

The Collaborative Relationship dimension captures a holistic approach to partnership-building between EHCOs and innovative suppliers. It highlights the essential elements of mutual engagement, structured involvement, and defined criteria that enable successful innovation in extramural healthcare. This dimension reflects a synergistic relationship where both EHCOs and suppliers contribute actively, leveraging trust-based partnerships, clear objectives, and shared responsibilities to navigate the complexities of innovation. It represents a cohesive partnership model that maximises innovation's potential through mutual trust, structured engagement, and clearly defined relationship standards. This model enables EHCOs to effectively deliver improved patient care and navigate the challenges of a resource-limited healthcare environment.

## 4.3 Attitudes Toward Innovation Adoption

### 4.3.1 Innovation Adoption

The adoption phase is critical in the innovation process, ultimately determining its success or failure. As one participant aptly emphasised, *"I would say 80% of success depends on how innovation is adopted in the care processes by employees"*(R6). During this phase, which follows implementation, the innovation is further refined and integrated into the organisation. While the supplier and EHCO initially collaborate to introduce the innovation to HCPs, the supplier's role transitions into a more supportive one. The responsibility for ensuring successful adoption falls primarily on the EHCO, with TAs playing a pivotal role in driving this process and encouraging acceptance among the HCPs.

TAs are indispensable in ensuring the smooth and successful innovation adoption across the organisation. Their key responsibility is to engage with HCPs and introduce them to innovation. It is crucial to execute the initial introduction of the innovation flawlessly, as any missteps or gaps in information-sharing can potentially give rise to resistance and impede the adoption process. Additionally, the procurement department plays a role in the innovation process, primarily in negotiating and finalising contracts and conditions. The influence of TA on the adoption of innovations is significant. As one participant highlighted, *"They [procurement] are very actively involved, always, but more on condition, say, that we don't enter into unsympathetic contracts and that they participate in market research that piece. But I think our TA, for example, has a bigger influence on"*(R11).

To drive this phased adoption process, TAs should initially focus on landing the innovation on a small scale, allowing a few select teams to become familiar with it before a wider rollout. One participant recommended that *"Start with land innovation and then start with small groups"* (R9). The early adoption of innovation within small groups is crucial in helping EHCOs proactively identify and address potential challenges before the innovation is implemented on a broader scale. The approach enables a gradual implementation process, allowing the organisation to gather feedback from personnel and integrate it to maximise the rollout's success. For individuals involved in these smaller groups, early exposure to the innovation offers significant benefits, such as becoming familiar with innovation and expressing any concerns or resistance before the adoption takes place on a larger scale. Furthermore, participating in the early adoption phase provides the opportunity to gain valuable knowledge, ultimately strengthening the organisation's ability to adopt and sustain successful changes.

This early adoption phase also provides an opportunity for the dissemination of positive experiences within the smaller groups, which can effectively facilitate eventual adoption by the larger group. As one participant noted, *"Positive experience means more people applied realisation care could give another way"*(R4). By sharing success stories, colleagues can instil trust and credibility around the innovation, making it more appealing to others. Hearing about the innovation's positive impact on the work of their colleagues can inspire confidence and enthusiasm among the larger group. Moreover, peer-to-peer sharing of positive experiences nurtures a supportive and collaborative environment within the EHCO. It fosters open

communication and knowledge exchange, allowing colleagues to learn from each other's experiences and best practices. Encouraging the sharing of positive experiences enables the EHCO to cultivate a culture of innovation where employees feel empowered to explore new ideas and approaches.

One participant highlighted that it's crucial to *"indicate that it takes time and what is expected from the healthcare institutions"*(R10) when implementing innovation. Successfully adopting innovation requires a significant commitment from EHCOs regarding time, resources, and organisational culture. This includes active engagement from both management and employees, as well as substantial investments in training and infrastructure. As one participant noted, *"Only after deployment and getting familiar with it often takes a lot of time and effort"*(R1).

Furthermore, EHCOs must anticipate and address potential resistance to change. Not all organisation members will immediately embrace innovations or practices. Cultivating a culture of openness and collaboration, where employees feel empowered to explore and embrace new ideas, is essential. Additionally, EHCOs should carefully assess the impact of innovation on workflow and quality of care. Ensuring that the innovation delivers the intended benefits without unintended negative consequences for patients or staff is crucial.

The Innovation Adoption theme reflects how early, structured engagement, phased trials, positive peer influence, and organisational commitment create a supportive environment for successful innovation adoption. By fostering collaboration and addressing challenges incrementally, EHCOs can ensure that innovations are effectively integrated, improving workflows and care quality while minimising disruptions.

### 4.3.2   Resistance against innovation adoption

Introducing innovation often entails changes that can meet with resistance from HCPs. There are usually two camps. As one participant noted: *"Still, there are two camps. You have people who think their work will be taken over and might lose their jobs. Also, people can be distrustful, thinking it won't happen. Another camp is one in which people welcome it with open arms"*(R8). In such cases, there are typically two groups of HCPS: those who readily embrace innovation and those who may be hesitant to adopt innovation. To successfully introduce innovation within the EHCO, it is imperative to bring the entire group on board, including those who may initially resist it. One participant stated, *"Resistance doesn't just arise (…..). If there is resistance, you must understand and try to resolve this resistance"*(R6). Resistance often stems from deeper concerns, such as fear of job displacement, lack of trust in technology, or a preference for familiar routines. Investigating these underlying causes enables EHCOs to implement targeted strategies to address them.

One significant factor that can contribute to resistance against innovation adoption is age. As one participant observed, *"And also whether you look critically at developments in healthcare. I believe many colleagues in care have always worked in a certain way and started feeling sorry for the clients, and they are then replaced by technology. Older colleagues have a bit more*

*difficulty with that''*(R3). This resistance among older HCPs may stem from a preference for familiar, tried-and-tested approaches, concerns about technology replacing human interaction in care, or difficulty adapting to new systems and processes. The older generation of HCPs is often more accustomed to the personal interactions and expressions of appreciation inherent in traditional healthcare settings. As one participant noted, *"You also see many people who prefer not to use healthcare innovation because they lose a bit of appreciation. As an HCP, you often hear, Thank you. Would you like another cup of coffee? You don't have that anymore when people start using digital tools. Many people go into healthcare to care, and you're trying to solve that with a tool''*(R9). When innovation shifts interactions towards technology, it can diminish these personal expressions of gratitude, leading to feelings of frustration and dissatisfaction among HCPs.

In contrast, younger HCPs, often exposed to new technologies and approaches throughout their education and training, tend to be more receptive to innovation. Younger HCPs have grown up with digital tools and are more comfortable incorporating them into their daily work. Younger generations of HCPs may also be more adaptable to change and see the potential benefits of technological advancements in improving healthcare delivery. Additionally, younger HCPs have become accustomed to how interact with patients, which are often less intense and more technology-driven than the traditional modes of patient interaction that their older HCPs may have experienced.

The educational level can also influence HCPs' perceptions of digital innovation. One participant noted, *"Higher-educated healthcare workers generally accept changes and digitisation quicker''(R5).* Individuals with lower levels of education may be more apprehensive about innovation, fearing job displacement or struggling to adapt to new systems and processes. This resistance can stem from perceiving technology as complex and intimidating. HCPs may avoid using the innovation for fear of making mistakes or providing patients with incorrect information, ultimately leading them to default to familiar, traditional care methods. To address this, EHCOs must actively listen to and acknowledge HCPs' grievances, creating a space for open dialogue and feedback. By understanding the underlying concerns, EHCOs can implement targeted strategies to help HCPs feel more comfortable and confident in adopting digital innovations regardless of their educational background.

Adding to this complexity, the sheer volume of emerging innovations in extramural healthcare can be overwhelming for HCPs. As one participant highlighted, *"HCPs don't know what to use. Digitally skilled people find it fun to try new things, but it could be that within a healthcare organisation, 20 different tools could be used. What should an HCP do, then? This is super difficult and creates a lot of chaos, leading to a loss of focus''*(R9). With numerous suppliers introducing new ideas and technologies, HCPs may struggle to stay informed and make informed decisions about which innovations best meet their needs and how to use them effectively. This lack of clarity and direction can create confusion and a sense of chaos within the EHCO, ultimately hindering the successful adoption of valuable innovations.

TAs are essential in influencing individuals and overcoming negative perceptions toward innovation to counter resistance to innovation. Involving internal staff is critical, as it helps create a trustworthy environment within the EHCO. Within such a supportive and reliable setting, TAs can provide personalised guidance through coaching and training to ensure a smooth transition to new technological innovations. As one participant suggested, it's crucial to *"Approach it more softly and involve people from within the organisations, with suppliers as advisors"*(R6). By humanising the adoption process, TAs can foster trust and rapport, making new technologies feel more relatable and accessible. Addressing concerns and uncertainties in a supportive and empathetic manner helps alleviate resistance and facilitate smoother adoption. Incorporating real-life examples and practical demonstrations can further enhance understanding, making the innovations more tangible and demonstrating their potential benefits in daily work. Ultimately, prioritising this human-centred approach creates a more conducive environment for successfully adopting and integrating new technologies.

The second-order theme, Resistance Against Innovation Adoption, captures the various dimensions of resistance, its causes, the importance of empathetic and targeted approaches to addressing it, and the demographic and experiential factors that influence it. This theme provides a comprehensive framework for understanding and tackling resistance, enabling EHCOs and suppliers to design effective strategies that foster innovation adoption while addressing the concerns of all stakeholders.

### 4.3.3 Overall conclusion

Attitudes Towards Innovation Adoption was selected as the aggregate dimension because it offers a comprehensive framework for understanding how human behaviours, perceptions, and organisational dynamics influence the adoption of innovations in extramural healthcare. This dimension bridges the interplay between facilitators and barriers, capturing both the positive efforts that enable innovation adoption and the resistance that challenges it. By integrating the second-order themes of Innovation Adoption and Resistance Against Innovation Adoption, the dimension reflects the dual nature of attitudes. It underscores their critical role in shaping the success or failure of innovation implementation.

## 4.4 Conceptual model

Based on the findings, Figure 2 provides deeper insights into the relationship between suppliers and HCPs regarding innovations in extramural healthcare. In Figure 1, holistic innovation care is directed towards the supplier, indicating that the success of the innovation depends on how the supplier interprets innovation in the context of extramural healthcare. The supplier can effectively collaborate with the EHCO by understanding the innovation process. It is also crucial that the EHCO is willing to cooperate to implement the innovation successfully. These collaborations can then shape the attitudes of the HCPs toward adopting innovation and ultimately impact the HCPs' acceptance of innovations in extramural healthcare, forming the basis for establishing a solid foundation.

*Figure 2: The emerging model*
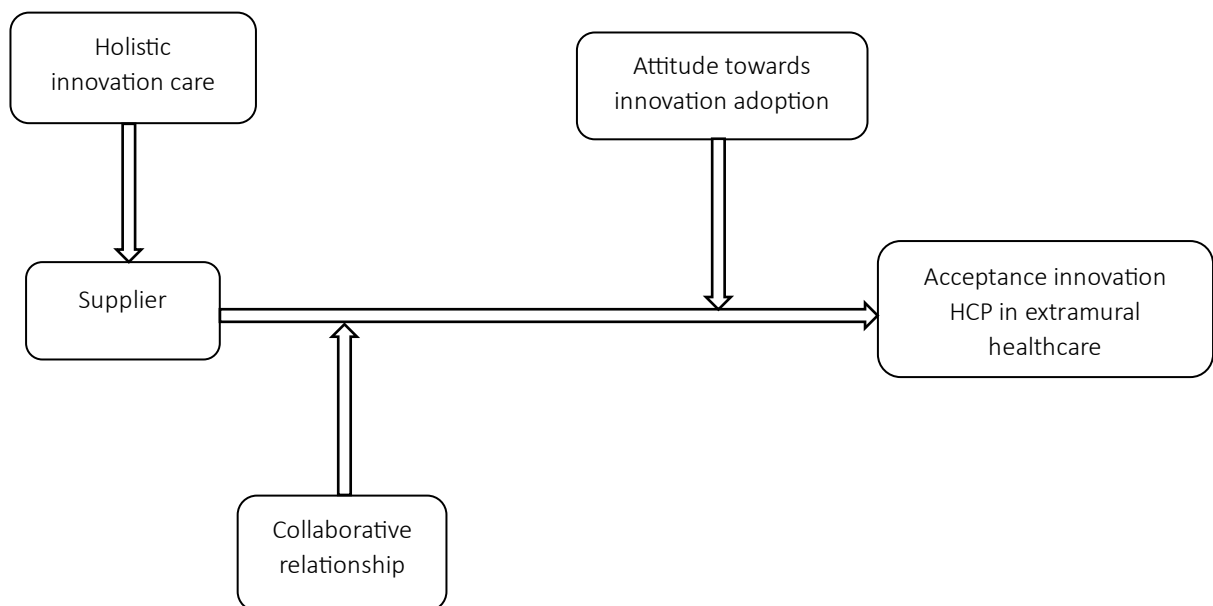
## 5. Discussion

The discussion chapter considers the practical and theoretical implications. Finally, it addresses the limitations and future research.

### 5.1 Theoretical implication

The findings of this study indicate that innovation in extramural healthcare is best understood as a holistic process. This process integrates technological and procedural advancements, driving comprehensive transformation within the care ecosystem. Innovation in this context is not a static implementation but a dynamic, iterative process. Participants emphasised that innovation involves continuous reflection and adaptation to ensure the care ecosystem evolves in response to emerging needs. This adaptability in extramural healthcare underscores the importance of ongoing improvements and adjustments, enabling healthcare systems to remain responsive and effective in meeting the changing demands.

This study makes significant theoretical contributions by redefining innovation in the extramural healthcare context. While traditional perspectives emphasise the transformative potential of healthcare innovation to enhance efficiency, speed, and cost-effectiveness (Thakur et al., 2012, p. 564), this study focuses on innovation as a strategic tool for achieving broader, patient-centred objectives. By prioritising adaptability and continuous evolution, it extends Damanpour (1991, p. 393) concept of innovation, illustrating how iterative and adaptive processes are essential for extramural healthcare systems to respond to rapidly changing demands and complexities effectively. This reconceptualisation positions innovation as a dynamic force driving systemic transformation rather than a series of isolated improvements.

In answer to sub-RQ1a: How do suppliers currently contribute to the innovation processes? This study shows how suppliers contribute to innovation through collaborative relationships focusing on mutual engagement, structured involvement, and defined criteria. Successful collaboration between suppliers and EHCOs is built on trust, open communication, and shared goals, enabling the co-creation of tailored solutions. Suppliers invest significant time in the early phases of innovation, conducting meetings, site visits, and discussions to understand EHCO's needs and challenges. Suppliers actively support implementation by providing training and coaching to equip HCPs effectively. Clear relationship standards, including mutual accountability and consistent feedback, further strengthen the relationship. By addressing complexities and uncertainties through collaborative problem-solving, suppliers deliver customised solutions aligned with EHCO-specific requirements.

This study makes theoretical contributions to the fields of healthcare innovation and supplier management by demonstrating how suppliers actively facilitate innovation through collaborative relationships that prioritise mutual engagement, structured involvement, and clearly defined criteria. This study reinforces and expands upon existing research on supplier involvement in innovation. Schiele (2006, p. 935) and Koufteros et al. (2012, p. 109) emphasise the importance of early and active supplier engagement in building competitive advantages. The findings of this study align with these perspectives but go further by illustrating how

suppliers invest significant time in understanding the specific needs of EHCOs through meetings, site visits, and collaborative discussions. This deep involvement ensures alignment between supplier offerings and the unique requirements of EHCOs, extending the application of these theories into the complex and dynamic context of healthcare innovation. Additionally, the study builds on Azadegan and Dooley (2010, p. 489) focus on collaborative product development and Vos et al. (2016, p. 4621) emphasis on relational behaviour by demonstrating how suppliers enhance adoption through structured support during the implementation phase. Suppliers' training, coaching, and e-learning resources equip HCPs to integrate innovations effectively, showing how suppliers contribute beyond traditional boundaries of product delivery.

In addition to supporting implementation, the findings underscore how suppliers evolve from product providers to strategic collaborators in the innovation process. By emphasising strategic partnerships and co-creation, the study extends Schiele (2012, p. 47) concept of achieving preferred customer status. It demonstrates how this status is operationalised through trust, open communication, and customised solutions. Furthermore, the study reveals suppliers as active contributors to strategic decision-making and innovation performance, a perspective that aligns with Pulles et al. (2014, p. 414) findings on professionalism and collaborative attitudes as key drivers of innovation.

The study also contributes to bridging healthcare innovation and supplier management by integrating the necessity of a shared vision (Cannavale et al., 2022, p. 761; MacLeod et al., 2020, p. 269) into supplier engagement practices. Suppliers foster mutual accountability and consistent feedback and help EHCOs navigate the complexities of innovation adoption, underscoring the importance of aligning supplier practices with broader care objectives.

In response to sub-RQ1b, this study suggests how suppliers can contribute to future innovation processes. Suppliers should focus on long-term strategies to support EHCOs, such as leveraging advanced analytics to optimise care, fostering seamless care coordination, and simplifying technologies for smoother adoption. Ongoing collaboration through reviews and updates will ensure alignment with evolving needs. Clear financial criteria and sustainability plans can prevent unexpected costs, while scalable knowledge transfer empowers EHCOs to independently manage innovations. Strengthening partnerships through shared goals and responsibilities will foster adaptive innovation and support healthcare system resilience.

This proactive approach makes a theoretical contribution expanding the understanding of suppliers' roles in healthcare innovation. It builds on the existing literature of Greco et al. (2016, p. 503) who emphasise the importance of collaboration in exchanging tacit and explicit knowledge. However, it extends by demonstrating how proactive supplier engagement mitigates risks and inefficiencies and creates a foundation for long-term adaptive innovation. The emphasis on advanced analytics, care coordination, and scalable knowledge transfer highlights the evolving role of suppliers as strategic partners who enable healthcare systems to navigate dynamic and complex environments.

To address Sub-RQ2a – Which skills/competencies belong to extramural healthcare sector professionals' roles in facilitating the acceptance of innovations amongst their colleagues? TAs play a pivotal role by leveraging strong interpersonal and communication skills to engage teams, share knowledge, and build trust. TAs further support colleagues through innovation adoption by providing coaching, training, and problem-solving expertise to address emerging challenges. PPPs contribute by negotiating favourable contract terms, making strategic decisions, ensuring financial sustainability, and aligning with organisational goals. Additionally, HCPs themselves play a vital role by influencing their peers through the sharing of positive experiences and by adapting workflows to integrate innovations.

This study makes another theoretical contribution by refining and expanding the understanding of the role and competencies required for innovation facilitation in extramural healthcare. The role of TAs aligns with literature emphasising the need for interpersonal and communication skills in facilitating innovation (Stek & Schiele, 2021, p. 5). Similar to the innovation promoter described by Goldberg and Schiele (2020, p. 183). TAs in this study demonstrated the ability to manage change processes and foster commitment through tailored coaching and training efforts. However, a significant difference lies in their scope and emphasis. The innovation promoter focuses primarily on advancing innovation sourcing activities. This role is more strategic and procurement-centric, often tied to identifying and facilitating the integration of external innovations (Goldberg & Schiele, 2020, p. 183). In contrast, TAs in this study operate closer to the implementation phase within healthcare settings. Their role extends beyond sourcing to include coaching, training, and hands-on support to ensure the successful integration of innovations at the team level.

Giving an answer on Sub RQ2b – Which skills/competencies belonging to which roles must extramural healthcare sector professionals develop in facilitating the acceptance of innovations amongst their colleagues? Extramural HCPs must develop additional skills and competencies to enhance their effectiveness in facilitating innovation acceptance. TAs should focus on leadership skills to inspire confidence and motivate teams and conflict resolution abilities to address resistance empathetically. Expanding their technical knowledge will better equip them to explain innovations and troubleshoot issues. Cultural sensitivity is also essential for tailoring approaches to diverse groups with varying levels of comfort with technology. HCPs must enhance their digital literacy, build change management resilience, and foster systematic peer-to-peer knowledge sharing. Effective communication, empathy, and collaboration are critical for ensuring clarity around innovation benefits, expectations, and goals. Addressing resistance requires understanding and resolving concerns such as fears of job displacement or diminished personal interactions, particularly among older or less digitally skilled professionals. By fostering a culture of innovation and encouraging feedback, professionals can build trust and credibility. Leadership and advocacy are vital for empowering individuals to champion change and create a supportive environment for adoption.

The study makes a theoretical contribution by advancing the understanding of the evolving roles and competencies required to facilitate innovation acceptance in healthcare settings. It extends existing theories on skill development and role of specialisation of Delke (2022, p. 128) by contextualising them within the unique challenges of the extramural healthcare sector. By identifying the importance of leadership, cultural sensitivity, and conflict resolution for TAs, the study broadens the scope of required competencies beyond the technical and strategic skills traditionally associated with innovation facilitation.

## 5.2 Practical implications

This study underscores the critical need for collaboration, adaptability, and strategic alignment in driving innovation within extramural healthcare.

To facilitate smoother adoption of innovations, extramural HCPs should focus on developing skills in digital literacy, change management, and conflict resolution. Establishing peer-to-peer learning platforms to share best practices and success stories can foster team-wide confidence in adopting new solutions. Proactive engagement in the innovation process is crucial to ensure technologies align with workflows and address practical needs. Addressing resistance by understanding and addressing specific concerns, such as fears of job displacement or diminished interactions, can build trust and significantly enhance adoption outcomes.

Suppliers should adopt co-creation strategies to enhance supplier influence on innovation acceptance. This involves engaging with EHCO throughout the design and iteration phases to tailor products and services to their specific organisational needs. Comprehensive training and support, including e-learning resources and coaching, are crucial for equipping healthcare professionals with the necessary skills to facilitate successful integration. Suppliers should focus on developing scalable and flexible solutions to accommodate the complexities of broader care networks. Early engagement with insurers is essential to clarify coverage and reduce financial uncertainties for EHCOs and patients. Moreover, integrating sustainability plans with clear financial criteria into innovation strategies can demonstrate long-term value and prevent financial strain. These holistic approaches will strengthen supplier influence and drive the effectiveness of innovations within the extramural healthcare sector.

Policymakers must take a role in fostering a supportive environment for innovation. Promoting collaborative frameworks through grants or incentives for joint projects between EHCOs and suppliers is essential. Streamlining insurance processes with clear guidelines for innovative technology coverage will mitigate uncertainties and encourage adoption. Funding or mandating comprehensive training programs focused on digital literacy, change management, and cultural sensitivity will ensure that HCPs can effectively implement innovations. Furthermore, scalability should be a key criterion for funding, incentivising innovations that adapt to broader care networks' evolving demands.

### 5.3 Limitations and future research

The research provided valuable insights into supplier collaboration in the extramural healthcare sector, highlighting the importance of TAs in driving innovation adoption. However, the study faced limitations, presenting opportunities for future targeted research. The limited literature on extramural healthcare may have affected the study's validity, leading to information gathering from related domains like intramural healthcare and public/private healthcare. The qualitative methodology involved eleven semi-structured interviews with more suppliers and HCPs than procurement specialists, potentially impacting internal validity. Additionally, the data analysis conducted by a single researcher could introduce subjectivity, particularly during the coding phase, where different interpretations may arise. The researcher's perspectives and biases may have influenced the development of codes, themes, and aggregate dimensions, potentially affecting the study's internal validity and reliability.

The limited research on extramural healthcare highlights the need for future studies to explore the unique challenges and enablers of innovation adoption in this sector, especially compared to intramural healthcare and other areas. Researchers could focus on procurement specialists to understand their decision-making and collaboration with suppliers in driving innovation adoption. Additionally, using multiple researchers for qualitative analysis or combining quantitative surveys with interviews could strengthen the reliability and validity of the findings.

Future research could investigate the operational approaches of TAs, exploring their specific strategies to build trust, address scepticism, and persuade HCPs to adopt new technologies. Additionally, examining the role of insurers in facilitating collaborations between EHCOs and suppliers could yield valuable insights. Such studies could analyse the collaborative dynamics, associated challenges, and criteria for innovation funding and reimbursement to provide a critical understanding of the healthcare innovation ecosystem. Research could also focus on care coordination in extramural healthcare, examining collaborations between different organisations and the involvement of suppliers to identify effective care models and the role of technology in enhancing coordination.

Finally, Exploring how personal factors like age, education, and experience affect HCPs' acceptance of innovations could help develop tailored training and support. Building on this study's findings, future research could further advance the adoption and implementation of innovations in extramural healthcare.

## 6. Conclusion

The extramural healthcare sector in the Netherlands faces pressure due to an ageing population, increasing demand for home care, and a critical shortage of HCPs. Innovation is crucial for alleviating these pressures and ensuring the quality of care. While collaboration between healthcare and suppliers impacts innovation significantly, there is a limited understanding of these collaborations within the extramural healthcare sector specifically. This research aims to address this gap by exploring suppliers' role in fostering the acceptance of innovations among HCPs in this setting, as well as the role suppliers play in facilitating the acceptance of innovations among healthcare professionals in the extramural healthcare sector.

Suppliers are vital in helping HCPs accept innovations in the extramural healthcare sector. Beyond just providing products, suppliers collaborate strategically with healthcare organisations. Suppliers build trust, co-create tailored solutions, and support implementation through training, data analytics, and coaching. This involvement addresses barriers like cost uncertainties and adoption challenges, strengthening the healthcare system's adaptability and resilience.

TAs are essential intermediaries between suppliers and HCPs, guiding innovation adoption with technical expertise and strong communication skills. As the process progresses, TAs address HCP concerns, such as resistance due to perceived complexity, ensuring successful integration into daily practice. Age, education, and user-friendliness influence acceptance significantly, emphasising the need for tailored approaches.

Ultimately, suppliers drive patient-centred transformation by aligning innovation with EHCO needs, overcoming challenges, and fostering collaboration. This highlights supplier engagement as a cornerstone of practical innovation in the extramural healthcare sector.

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## Appendix 1 Written consent

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Datum …………………………………………………………………….

Allereerst, hartelijk dank voor uw bereidheid om deel te nemen aan het interview. Het onderzoek richt zich op de rol van leveranciers bij het bevorderen van de acceptatie van innovatie door extramurale medewerkers in de gezondheidszorg. De interviewvragen zijn gebaseerd op bestaande literatuur. Tijdens het interview ben ik benieuwd naar uw ervaringen met de betrokkenheid van leveranciers bij innovaties, de verspreiding van innovaties en de acceptatie ervan.

Het interview zal ongeveer 30 minuten duren. In overleg met u wordt het interview opgenomen en de opnames zullen worden gebruikt voor het transcriberen. Tijdens het transcriberen wordt alle informatie anoniem gemaakt. Ter bevestiging wordt het transcript naar uw toegestuurd. Zodra het onderzoek is voltooid, wordt het transcript verwijderd.
Nogmaals bedankt voor uw tijd en moeite. Als u akkoord gaat met de voorwaarden van het interview, ontvang ik graag uw handtekening.

Daan Pierik
Business Administration
(Purchasing & Supply Management)
University of Twente


………………………………….                                     …………………………………………..

## Appendix 2 Interview protocol

### Healthcare professionals extramural sector

### Opening of the interview

Allereerst bedankt voor het meewerken aan het interview. Mijn naam is Daan Pierik en voor de Universiteit van Twente doe ik onderzoek naar welke rol de leverancier spelen bij het faciliteren van de acceptatie van innovaties door personeel van extramurale medewerkers in de gezondheidszorg. Voordat er gestart wordt met het afnemen van het interview, wil ik toestemming vragen om het interview op te nemen en te transcriberen. Het interview zou ongeveer 30 á 45 minuten duren. Alle informatie die tijdens het interview wordt besproken, blijft anoniem. Als bevestiging ontvangt u een transcript van het interview.

### Checklist with general information

Voordat de interviews plaatsvinden, wordt eerst een checklist afgewerkt waarin algemene informatie mee wordt verschaft. De checklist is hieronder te vinden:

| | |
|---|---|
| Wat is uw leeftijd? | …………. |
| Wat is uw geslacht? | …………. |
| Wat is uw opleidingsniveau? | …………. |
| Kunt u beschrijven welke functie u momenteel uitoefent? | …………. |
| Werkt u parttime of fulltime? | …………. |
| Hoe lang bent u werkzaam in de extramurale gezondheidszorgsector? | …………. |
| Kunt u ons iets vertellen over de verschillende fasen van je carrière in deze sector? | …………. |

### Introduction

Het interview start met een introductie. In de introductie legt de onderzoeker uit wat het doel van het interview is.

### Goal of the interview

De extramurale zorgsector staat momenteel onder druk vanwege veranderingen in de zorgdynamiek, de verschuivende demografie en het tekort aan zorgverleners. In de toekomst zal de gezondheidszorgsector meer focus leggen op innovatie om de productiviteit te handhaven en uitdagingen aan te pakken. Hoewel de impact van samenwerking tussen gezondheidszorginkoop en leveranciers op innovatie erkend wordt, is er nog meer onderzoek nodig met betrekking tot de rol van leveranciers bij de acceptatie van innovatie door

extramurale medewerkers. Het doel van het onderzoek is om meer te begrijpen over hoe leveranciers invloed hebben op de acceptatie innovaties door extramurale medewerkers.

## Supplier involvement in healthcare

De volgende vragen gaan over de rol van leveranciers bij innovaties in extramurale omgeving. De vragen helpen te begrijpen hoe de extramurale werkgever de rol van leveranciers ziet. De vragen hebben betrekking op innovatie en supplier involvement. Voordat de vragen gesteld worden is het handig om vanuit de theorie een uitleg te geven wat er wordt bedoeld met innovatie en supplier involvement.

Volgens Schumpeter (1934) verwijst innovatie naar een verandering in de productiemethode, de creatie van nieuwe producten, bedrijfsstructuren, of het betreden van een nieuwe markt. Innovatie in de gezondheidszorg verwijst naar transformatieve veranderingen die zorgverleners in staat stellen zich te concentreren op de patiënt. Dit omvat verbeteringen in efficiëntie, snelheid, kwaliteit en kosteneffectiviteit.

Azadegan en Dooley (2010) hebben vastgesteld dat leveranciers een belangrijke rol spelen bij het ondersteunen van innovatieve processen in product- en procesverbetering. De leveranciers kunnen betrokken zijn bij het verbeteren van producten en processen door nieuwe ideeën en materialen te leveren of samen te werken aan het ontwikkelen van nieuwe producten.

## Description term innovation

- Hoe omschrijft u innovatie binnen de extramurale omgeving van de gezondheidszorg?
- Kunt u vertellen hoe innovatie plaatsvindt in uw dagelijkse werk in de extramurale gezondheidszorg?
    - Wat vindt u van deze innovaties?

## The supplier of innovations and the extramural employee in healthcare

- Hoe dragen leveranciers volgens u bij aan innovaties in de extramurale omgeving?
    - Hoe heeft dit de patiëntenzorg beïnvloed?
- Hoe werkt u samen met leveranciers om innovatieve processen te bevorderen?
    - Kunt u een voorbeeld geven van succesvolle samenwerking die heeft geleid tot verbetering van zorgprocessen?
    - Waarom was deze samenwerking succesvol?
    - Heeft u een voorbeeld van een minder succesvolle samenwerking?
- Wat zijn voor u belangrijke criteria om te beoordelen of een leverancier innovatief is?
- Gezien de groeiende druk op extramurale zorg, hoe denkt u dat leveranciers kunnen helpen met innoveren om aan de veranderende behoeften van zorgverlening in de extramurale omgeving te voldoen?

## Navigating the healthcare innovation landscape

De volgende vragen gaan over hoe innovatie worden verspreid binnen de extramurale gezondheidszorg en welke belemmeringen hierbij komen kijken.

- Welke strategieën/methoden worden gebruikt voor het implementeren van innovatie in de extramurale zorg?
- Vanuit uw perspectief, welke factoren dragen bij aan een succesvolle verspreiding van innovatie binnen uw organisatie?
  - Wat zijn uitdagingen die innovaties kunnen belemmeren?
  - Hoe zouden deze belemmeringen kunnen worden aangepakt?
- Naar uw ervaring, welke rol speelt de inkoopafdeling binnen de gezondheidsorganisatie bij het faciliteren van de adoptie van innovaties van leveranciers?

## Acceptance of innovations in healthcare

De volgende vragen hebben betrekking op de acceptatie van innovatie in de extramurale gezondheidszorg. Er wordt geprobeerd meer inzicht te krijgen vanuit het perspectief van de extramurale werkgever waarom innovaties wel of niet worden geaccepteerd.

- Kunt u ervaringen delen met het aannemen van nieuwe innovaties in uw extramurale gezondheidsomgeving?
  - Welke veranderingen bracht de innovatie met zich mee?
  - Hoe gaat u om met veranderingen die innovatie met zich mee?
- Welke factoren beïnvloeden uw bereidheid om innovaties binnen de extramurale gezondheidszorgsector te accepteren en te gebruiken?
- Kunnen het type beroep en de leeftijd invloed hebben de acceptatie van innovaties in de extramurale zorg? Zo ja, op welke manier?
- Hoe denkt uw dat weerstand tegen innovatie beter aangepakt kan worden?

## Ending

- Als laatste vraag wil ik graag weten of er nog iets is dat u graag zou willen delen of toelichten wat nog niet ter sprake is gekomen?

Tot slot wil ik u hartelijk bedanken voor uw waardevolle bijdrage en uw tijd! Mocht er nog iets onduidelijk zijn, kan ik dan contact met u opnemen?

## Interview protocol procurement specialists

### Opening of the interview

Allereerst bedankt voor het meewerken aan het interview. Mijn naam is Daan Pierik en voor de Universiteit van Twente doe ik onderzoek naar welke rol de leverancier spelen bij het faciliteren van de acceptatie van innovaties door personeel van extramurale medewerkers in de gezondheidszorg. Voordat er gestart wordt met het afnemen van het interview, wil ik toestemming vragen om het interview op te nemen en te transcriberen. Het interview zou ongeveer 30 á 45 minuten duren. Alle informatie die tijdens het interview wordt besproken, blijft anoniem. Als bevestiging ontvangt u een transcript van het interview.

### Checklist with general information

Voordat de interviews plaatsvinden, wordt eerst een checklist afgewerkt waarin algemene informatie mee wordt verschaft. De checklist is hieronder te vinden:

| | |
|---|---|
| Wat is uw leeftijd? | ………… |
| Wat is uw geslacht? | ………… |
| Wat is uw opleidingsniveau? | ………… |
| Kunt u beschrijven welke functie u momenteel uitoefent? | ………… |
| Werkt u parttime of fulltime? | ………… |
| Hoe lang bent u werkzaam in de extramurale gezondheidszorgsector? | ………… |
| Kunt u ons iets vertellen over de verschillende fasen van je carrière in deze sector? | ………… |

### Introduction

Het interview start met een introductie. In de introductie legt de onderzoeker uit wat het doel van het interview is.

### Goal of the interview

De extramurale zorgsector staat momenteel onder druk vanwege veranderingen in de zorgdynamiek, de verschuivende demografie en het tekort aan zorgverleners. In de toekomst zal de gezondheidszorgsector meer focus leggen op innovatie om de productiviteit te handhaven en uitdagingen aan te pakken. Hoewel de impact van samenwerking tussen gezondheidszorginkoop en leveranciers op innovatie erkend wordt, is er nog meer onderzoek nodig met betrekking tot de rol van leveranciers bij de acceptatie van innovatie door extramurale medewerkers. Het doel van het onderzoek is om meer te begrijpen over hoe leveranciers invloed hebben op de acceptatie innovaties door extramurale medewerkers.

## Supplier involvement in healthcare

De volgende vragen gaan over de rol van leveranciers bij innovaties in extramurale omgeving. De vragen helpen te begrijpen hoe de leverancier zelf zijn/haar rol ziet op het gebied van innovaties.

Volgens Schumpeter (1934) verwijst innovatie naar een verandering in de productiemethode, de creatie van nieuwe producten, bedrijfsstructuren, of het betreden van een nieuwe markt. Innovatie in de gezondheidszorg verwijst naar transformatieve veranderingen die zorgverleners in staat stellen zich te concentreren op de patiënt. Dit omvat verbeteringen in efficiëntie, snelheid, kwaliteit en kosteneffectiviteit.

Azadegan en Dooley (2010) hebben vastgesteld dat leveranciers een belangrijke rol spelen bij het ondersteunen van innovatieve processen in product- en procesverbetering. De leveranciers kunnen betrokken zijn bij het verbeteren van producten en processen door nieuwe ideeën en materialen te leveren of samen te werken aan het ontwikkelen van nieuwe producten.

### Description term innovation

- Hoe omschrijft u innovatie binnen de extramurale omgeving van de gezondheidszorg?

### The supplier of innovations and the extramural employee in healthcare

- Vanuit uw perspectief, welke impact hebben leveranciers op het stimuleren van innovatie binnen de extramurale gezondheidszorgsector?
- Welke innovatieve capaciteiten zijn essentieel voor leveranciers om op een zinvolle manier bij te dragen aan de innovatieprocessen binnen de extramurale gezondheidszorg?
- Kunt u meer inzicht geven in hoe u samenwerkt met leveranciers binnen de extramurale gezondheidszorg?
  - Kunt u voorbeelden delen van succesvolle samenwerking tussen uw inkoopafdeling en leveranciers die hebben geleid tot innovatieve resultaten?
  - Wat waren de belangrijkste factoren die hebben bijgedragen aan het succes van deze samenwerkingen?
- Gezien de groeiende druk op extramurale zorg, hoe denkt u dat leveranciers kunnen helpen met innoveren om aan de veranderende behoeften van zorgverlening in de extramurale omgeving te voldoen?

### Navigating the healthcare innovation landscape

De volgende vragen gaan over hoe innovatie worden verspreid binnen de extramurale gezondheidszorg en welke belemmeringen hierbij komen kijken.

- Welke strategieën/methoden hanteert uw inkoopafdeling voor het implementeren van innovaties in de extramurale zorgsector?

- o Vanuit uw perspectief, welke factoren dragen bij aan het succesvol verspreiden van innovaties binnen de gezondheidsorganisaties waarmee u samenwerkt?
- Welke uitdagingen ziet u die de implementatie van innovaties kunnen belemmeren?
    - o Hoe denkt u dat deze belemmeringen effectief kunnen worden aangepakt?
- Op welke manier werkt uw inkoopafdeling samen met de extramurale gezondheidsorganisaties om uitdagingen en barrières voor de adoptie van innovaties aan te pakken?
- Naar uw ervaring, welke rol speelt de inkoopafdeling binnen de gezondheidsorganisatie bij het faciliteren van de adoptie van innovaties van leveranciers?

## Acceptance of innovations in healthcare

De volgende vragen hebben betrekking op de acceptatie van innovatie in de extramurale gezondheidszorg. Er wordt geprobeerd meer inzicht te krijgen vanuit het perspectief van de leveranciers waarom innovaties wel of niet worden geaccepteerd.

- Kunt u vertellen over uw ervaringen met aanschaffen en implementeren van nieuwe innovaties binnen de extramurale gezondheidszorg?
    - o Welke factoren spelen volgens u een rol bij de acceptatie en het gebruik van innovaties binnen de extramurale gezondheidszorg?
- Denkt u dat bepaalde beroepen en leeftijdsgroepen invloed hebben op de acceptatie van innovaties in de extramurale zorg?
    - o Zo ja, op welke manier?
- Hoe zou volgens u weerstand tegen innovatie effectief kunnen worden aangepakt in de extramurale gezondheidszorgsector?

## Ending

- Als laatste vraag wil ik graag weten of er nog iets is dat u graag zou willen delen of toelichten wat nog niet ter sprake is gekomen?

Tot slot wil ik u hartelijk bedanken voor uw waardevolle bijdrage en uw tijd! Mocht er nog iets onduidelijk zijn, kan ik dan contact met u opnemen?

## Interview protocol supplier healthcare

### Opening the interview

Allereerst bedankt voor het meewerken aan het interview. Mijn naam is Daan Pierik en voor de Universiteit van Twente doe ik onderzoek naar welke rol de leverancier spelen bij het faciliteren van de acceptatie van innovaties door personeel van extramurale medewerkers in de gezondheidszorg. Voordat er gestart wordt met het afnemen van het interview, wil ik toestemming vragen om het interview op te nemen en te transcriberen. Het interview zou ongeveer 30 á 45 minuten duren. Alle informatie die tijdens het interview wordt besproken, blijft anoniem. Als bevestiging ontvangt u een transcript van het interview.

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| Wat is uw geslacht? | ………… |
| Wat is uw opleidingsniveau? | ………… |
| Kunt u beschrijven welke functie u momenteel uitoefent? | ………… |
| Werkt u parttime of fulltime? | ………… |
| Kunt u vertellen wat het bedrijf precies doet? | ………… |
| Kunt u ons iets vertellen over de verschillende fasen van je carrière in deze sector? | ………… |

### Introduction

Het interview start met een introductie. In de introductie legt de onderzoeker uit wat het doel van het interview is.

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### Supplier involvement in healthcare

De volgende vragen gaan over de rol van leveranciers bij innovaties in extramurale omgeving. De vragen helpen te begrijpen hoe de leverancier zelf zijn/haar rol ziet op het gebied van innovaties.

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### Description term innovation

- Hoe omschrijft u innovatie binnen de extramurale omgeving van de gezondheidszorg?
  - Welke soort innovatie kent u?

### The supplier of innovations and the extramural employee in healthcare

- Vanuit uw perspectief, welke rol spelen leveranciers bij het bevorderen van innovatie binnen de extramurale gezondheidszorgsector?
- Welke innovatieve capaciteiten zijn essentieel voor leveranciers om op een zinvolle manier bij te dragen aan de innovatieprocessen binnen de extramurale gezondheidszorg?
- Welke skills zijn er nodig vanuit de extramurale gezondheidszorg om innovatie aan te trekken?
- Kunt u meer vertellen over een samenwerkingsrelatie met een extramurale gezondheidsorganisatie?
  - Kunt u voorbeelden geven van gevallen waarin samenwerking tussen uw bedrijf en extramurale gezondheidszorgorganisaties heeft geleid tot succesvolle innovatieresultaten?
  - Waarom was deze samenwerking succesvol?
  - Heeft u een voorbeeld van een minder succesvolle samenwerking?
- Gezien de groeiende nadruk op extramurale zorg, hoe denkt u dat leveranciers kunnen helpen met innoveren om aan de veranderende behoeften van zorgverlening in de extramurale omgeving te voldoen?

### Navigating the healthcare innovation landscape

De volgende vragen gaan over hoe innovatie worden verspreid binnen de extramurale gezondheidszorg en welke belemmeringen hierbij komen kijken.

- Welke strategieën/methoden hanteert uw organisatie voor het implementeren van innovaties in de extramurale zorgsector?
  - o Vanuit uw perspectief, welke factoren dragen bij aan het succesvol verspreiden van innovaties binnen de organisaties waarmee u samenwerkt?
- Welke uitdagingen ziet u die de implementatie van innovaties kunnen belemmeren?
  - o Hoe denkt u dat deze belemmeringen effectief kunnen worden aangepakt?
- Hoe werkt u samen met extramurale gezondheidsorganisaties om uitdagingen en barrières voor de adoptie van innovaties aan te pakken?
- Naar uw ervaring, welke rol speelt de inkoopafdeling binnen gezondheidsorganisaties bij het faciliteren van de adoptie van innovatie van leveranciers?

### Acceptance of innovations in healthcare

De volgende vragen hebben betrekking op de acceptatie van innovatie in de extramurale gezondheidszorg. Er wordt geprobeerd meer inzicht te krijgen vanuit het perspectief van de leveranciers waarom innovaties wel of niet worden geaccepteerd.

- Kunt u vertellen over uw ervaringen met het introduceren van nieuwe innovaties in de extramurale gezondheidszorg?
  - o Welke factoren spelen volgens u een rol bij de acceptatie en het gebruik van innovaties binnen de extramurale gezondheidszorg?
- Denkt u dat bepaalde beroepen en leeftijdsgroepen invloed hebben op de acceptatie van innovaties in de extramurale zorg?
  - o Zo ja, op welke manier?
- Hoe zou volgens u weerstand tegen innovatie effectief kunnen worden aangepakt in de extramurale gezondheidszorgsector?

### Ending

Als laatste vraag wil ik graag weten of er nog iets is dat u graag zou willen delen of toelichten wat nog niet ter sprake is gekomen?

Tot slot wil ik u hartelijk bedanken voor uw waardevolle bijdrage en uw tijd! Mocht er nog iets onduidelijk zijn, kan ik dan contact met u opnemen?