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Strategic Knowledge Management in Micro-Enterprises

From Tacit Know-How to Digital Readiness in Finnish Veterinary Clinics

Entrepreneurship

Master's Thesis

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Micro-enterprises rely heavily on professional expertise and experiential know-how, making knowledge management (KM) both a strategic resource and a daily operational necessity. This study investigates how Finnish veterinary clinics create, share, and manage knowledge in their everyday work, and how these practices influence their digital and artificial intelligence (AI) readiness.

The theoretical framework draws on literature related to KM processes, tacit and explicit knowledge, and digital readiness in micro-enterprises. The study adopts a qualitative research design to explore the dynamics of knowledge creation, sharing, and utilization within professional service settings. Empirical data were collected through five semi-structured interviews with clinic owners and managers. The data were analysed using thematic analysis, allowing both literature-informed and emergent themes to be identified and interpreted within the broader theoretical context.

The findings indicate that KM in small veterinary clinics is primarily personal and informal, relying on individual routines, interpersonal communication, and situational problem-solving rather than formalized systems. Administrative fragmentation and time scarcity hinder the development of organizational KM practices, while strong professional autonomy both enables flexibility and limits standardization. The study concludes that digital transformation in micro-enterprises must begin with strengthening organizational KM capabilities, particularly documentation, data integration, and cultural readiness, before advanced AI solutions can be effectively adopted.

Key words: Knowledge Management, Tacit Knowledge, Digital Readiness, Micro-Enterprises, Veterinary Clinics, Entrepreneurship, Artificial Intelligence

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Mikroyritykset ovat vahvasti riippuvaisia ammatillisesta asiantuntemuksesta ja kokemuksellisesta osaamisesta, minkä vuoksi tiedonhallinta (Knowledge Management, KM) on sekä strateginen resurssi että päivittäisen toiminnan edellytys. Tämä tutkimus tarkastelee, miten suomalaiset eläinlääkäriasemat luovat, jakavat ja hallitsevat tietoa osana arjen työprosessejaan, sekä miten nämä käytännöt mahdollistavat digitaaliseen- ja tekoälyvalmiuteen.

Tutkimuksen teoreettinen viitekehys pohjautuu kirjallisuuteen, joka käsittelee tiedonhallinnan prosesseja, hiljaista ja eksplisiittistä tietoa sekä digitaalista valmiutta mikroyrityksissä. Tutkimus hyödyntää laadullista tutkimusasetelmaa ammatillisten palveluorganisaatioiden tiedonluonnin, -jakamisen ja -hyödyntämisen dynamiikan tarkastelussa. Empiirinen aineisto kerättiin viiden puolistrukturoidun haastattelun avulla, joissa onsallistujina toimivat klinikoiden omistajat ja johtajat. Aineisto analysoitiin temaattisella analyysilla, mikä mahdollisti sekä kirjallisuuteen pohjautuvien että aineistosta esiin nousevien teemojen tunnistamisen ja tulkinnan laajemmassa teoreettisessa kontekstissa.

Tulokset osoittavat, että tiedonhallinta pienissä eläinlääkäriasemissa on ensisijaisesti henkilökohtaista ja epämuodollista, perustuen yksilöllisiin toimintatapoihin, henkilökohtaiseen viestintään ja tilannekohtaisen ongelmanratkaisun hyödyntämiseen pikemminkin kuin systemaattisiin ja formalisoituihin käytäntöihin. Hallinnollinen pirstaleisuus ja ajanpuute vaikeuttavat organisoitujen KM-käytäntöjen kehittämistä, kun taas vahva ammatillinen autonomia mahdollistaa joustavuuden mutta samanaikaisesti rajoittaa standardointia. Tutkimus päätyy siihen, että digitaalinen transformaatio mikroyrityksissä edellyttää ensisijaisesti organisaation KM-valmiuksien vahvistamista – erityisesti dokumentaation, tiedon integroinnin ja kulttuurisen valmiuden osalta – ennen kuin kehittyneitä tekoälyratkaisuja voidaan hyödyntää tehokkaasti.

Avainsanat: Tiedonhallinta, Hiljainen tieto, Digitaalinen valmius, Mikroyritykset, Eläinlääkäriasemat, Yrittäjyys, Tekoäly

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1 Introduction

Knowledge management (KM) has emerged as a critical strategic asset for organizations seeking to thrive in today's rapidly evolving business landscape. In the evolving digital era and data-driven world, organizations are inundated with vast amounts of information, data and knowledge, struggling with challenges including siloed information, knowledge hoarding, and a lack of formal KM practices (Jarrah et al., 2023.) It wasn't until the early 1990s that knowledge was recognized as a strategic resource, particularly by managers in developed countries and consultancy firms (Koech et al., 2015). Since then, KM has been a significant management issue (Lai et al., 2011). Historical practices laid the foundation for modern KM, which consists of creating, capturing, sharing, and utilizing an organization's knowledge. This is exemplified by the transmission of commercial knowledge across generations within family businesses, the apprenticeship system for skilled trades, and the informal sharing of ideas, experiences, insights, and know-how among organizational members (Koech et al., 2015.) The fourth industrial revolution, known as Industry 4.0, is said to increase the possibilities and potential of industry through digitalization. The amount of data is growing exponentially and managing it has become an increasingly significant challenge for organizations (Cerchione et al., 2024.)

For micro-enterprises KM is especially vital, as the business depends on professional know-how (Løwendahl et al., 2001)., customer trust, and personalized service quality (Empson, 2001). Their knowledge practices are typically embedded in everyday work routines, relying on tacit expertise, interpersonal communication and informal documentation (Durst & Runar Edvardsson, 2012). In Finland and across Europe, the veterinary industry has experienced increased consolidation as corporate chains acquire smaller clinics. Independent clinics remain prevalent but operate under growing administrative and technological pressures (European Veterinary Federation, 2023.) Veterinary clinics represent a unique intersection of expert knowledge, entrepreneurial structure, and evolving technological demands. Unlike larger healthcare organizations with dedicated administrative support and formalized knowledge systems, small veterinary practices must balance clinical expertise with business management, often without specialized training in either domain (Hompas & Liang, 2025.) The nature of veterinary knowledge itself makes these clinics compelling research sites. Veterinarians must integrate formal biomedical education with experiential, practice-based learning accumulated through diverse case encounters (Proctor et al., 2011.) Veterinary clinics exemplify the tensions between autonomy and collaboration that characterize many small micro-enterprises. Individual veterinarians value professional independence and clinical decision-making authority, yet effective practice requires coordination among veterinarians, veterinary nurses, and administrative staff (Hompas & Liang, 2025.) This balance between individual expertise and collective organizational knowledge creates dynamics worth examining. They are established enough to have

developed knowledge practices, yet small and agile enough that transformation remains feasible, providing insights into how professional service firms navigate digital transformation from positions of varying KM maturity.

The objective of this study is to undertake a systematic and theoretically informed analysis of knowledge management practices within Finnish veterinary clinics. It investigates how these clinics manage, share, and store knowledge in their everyday operations and how these practices shape their readiness to adopt digital and AI-based systems through following research questions:

1. How do small veterinary clinics currently manage and share knowledge in daily operations?
2. What are the main barriers and enablers to effective KM in these clinics?
3. How does readiness for AI and digital knowledge systems manifest in veterinary clinic contexts?

The thesis begins by providing a foundational understanding of organizational KM, including the nature of knowledge, the impact of digitalization, and the role of organizational KM and KM practices in micro-enterprises. It also discusses digital readiness and technology adaptation in entrepreneurial context and owner-manager roles in clinics. The thesis employs a qualitative research approach which will be explained in chapter 3. The study exclusively examines internal knowledge transfer processes within the organization. Stakeholder relationships are not analysed in this research, only KM processes inside the organization. To gain insights into the real-world challenges and opportunities, the findings of the empirical study are analysed in the fourth chapter. Follower by chapters 5 and 6, discussing the implications of the findings, relation to the literature and proposing future research directions.

2 Definitions and key concepts of knowledge management

This chapter delves into the fundamental concepts of KM in organizations. First, defining knowledge, information and data and then distinguishing between tacit and explicit knowledge. Additionally, it will discuss the role of organizational KM in micro-enterprises.

2.1 Definition of knowledge

The philosophical underpinnings of KM can be traced back to classical Greek philosophy. Socrates, for instance, emphasized the importance of knowledge as something that can be taught and shared (Maravilhas & Martins, 2019.) However, the nature of knowledge itself has been a subject of much debate. Davenport and Prusak (1998) argue that knowledge is not merely information but rather the ability to apply information effectively. Knowledge is a cognitive and dynamic construct; personalized information held within the minds of individuals. It is inherently context-specific, depending on temporal and spatial factors. Without the provision of a relevant context, knowledge remains devoid of meaning, constituting mere data (Nonaka et al., 2000.) It is shaped by individual experiences, values, and contextual understanding. Knowledge provides a framework for interpreting and integrating new information, enabling individuals to make informed judgments and decisions. It comprises facts, procedures, concepts, interpretations, ideas, observations, and judgments, the veracity, novelty, and utility of which may vary (Alavi & Leidner, 2001; Davenport & Prusak, 1998.) Knowledge is developed through learning processes, reliant on recollection, prior experience, and effective transfer mechanisms. Knowledge can be created, stored, retrieved, disseminated, and lost, highlighting its dynamic and complex nature (Vadari & Desik, 2021.) It may be conceptualized as a collection of objects, rules, and best practices. It constitutes a state of cognitive awareness, comprehension, and accumulated wisdom acquired through experience and formal learning (Barcelo-Valenzuela et al., 2016.)

Alavi and Leidner (2001) offer a hierarchical view of knowledge, distinguishing between data, information, and knowledge. Data is raw, unprocessed facts. Information is data that has been given meaning and context. Knowledge, on the other hand, is the application of information to solve problems or create value. It is a complex interplay of cognitive, emotional, and social factors. Only when knowledge is read, understood, and shared among people and once it leaves the human mind, it becomes mere information (Al-Hawamdeh, 2002.) For example, while books and papers can provide valuable insights and information, they cannot fully capture the nuances and tacit dimensions of an author's knowledge. For readers, these texts serve as a starting point for learning and understanding, but true knowledge acquisition requires active engagement and the ability to apply the information to

real-world contexts (Davenport & Prusak, 1998.) While some types of knowledge, such as facts and procedures, can be easily codified and captured in documents and databases, other forms of knowledge, such as tacit knowledge embedded in skills and expertise, are more challenging to formalize. Skills and competencies are best transferred through hands-on training, mentoring, and apprenticeship (Al-Hawamdeh, 2002.)

2.2 Tacit and explicit knowledge

Knowledge can be categorized as either tacit or explicit. Explicit knowledge is objective, rational, and sequential. It is often expressed in digital formats such as data, formulas, and text, and is typically associated with theories and formal reasoning (Maravilhas & Martins, 2019.) In organizations it can expressed through data, formulas, specifications, manuals, processes, procedures, checklists, and guidelines (Vadari & Desik, 2021).

Tacit knowledge, often considered a uniquely human form of knowledge, is deeply rooted in individual experiences and interactions with others and the environment. It is often acquired unconsciously through training and real-world experiences, making it difficult to articulate or codify (Al-Hawamdeh, 2002.) It is subjective and experiential, often referred to as "know-how, non-verbalized or intuitive knowledge (Vadari & Desik, 2021). It's acquired through practice and personal experience, making it challenging to articulate or share with others. This type of knowledge, rooted in individual insights, intuitions, and hunches, is often best understood through direct observation and interaction (Maravilhas & Martins, 2019.) That is why it’s difficult to replicate. Recognizing and leveraging both types of knowledge is essential for organizations to thrive in today's knowledge-driven economy (Barcelo-Valenzuela et al., 2016; Nonaka et al., 2000).

2.3 Organizational knowledge management model

The increasing complexity of organizations and the rapid pace of technological change have made KM a critical strategic issue. In a world characterized by rapid change in markets, products, technologies, competition, regulations, continuous innovation, and societal structures, individuals in organizations often face information overload. This makes it increasingly difficult to navigate the vast amount of information available and identify what is truly relevant (Nonaka et al., 2000; Teece, 2000.) Organization's ability to create value, boosting competitiveness and having resilience depends on its capacity to create, transfer, and utilize knowledge (Davenport & Prusak, 1998; Maravilhas & Martins, 2019; Rezaei et al., 2021; Taherdoost & Madanchian, 2023). Organizational knowledge is often distributed across individuals and systems, both explicitly in documents and repositories and tacitly in

routines, processes, practices, and norms (Davenport & Prusak, 1998). It should focus on managing the flow of information to ensure that the right people receive the right information at the right time (Al Mansoori et al., 2021).

Figure 1: Knowledge management processes

As Brown and Duguid (1998) argue, knowledge is not solely an individual possession but a social property, emerging from collective experiences and interactions within work groups. Following the frameworks of previous studies in KM practices, Figure 1. was formalized. The literature suggests a categorization of KM into four primary themes: knowledge creation, documentation and storage, sharing, and acquisition (Jarrahi et al., 2023).

First, effective knowledge creation is crucial for organizational innovation and performance. Knowledge creation refers to the ongoing process through which individuals and groups generate new insights, practices, and problem-solving approaches that improve organizational capabilities (Nonaka & Takeuchi, 1995.) By fostering a culture that encourages knowledge creation, organizations can harness the collective intelligence of their employees to develop innovative solutions and drive business growth (Lee et al., 2013.)

The second process, knowledge documentation and storage, involves preserving knowledge for future use. This can be achieved through various methods, including electronic documentation, databases, and expert systems. Organizational memory, a crucial component of knowledge storage, encompasses both explicit and tacit knowledge, facilitating its retrieval and application (Alavi & Leidner, 2001; Vadari & Desik, 2021.) By effectively storing knowledge, organizations can avoid knowledge loss, promote learning, and enhance decision-making. Advanced technologies, such as document management systems and database management systems, can further optimize knowledge storage and retrieval processes (Lee et al., 2013; Stein & Zwass, 1995.)

Third, knowledge sharing involves the exchange of information and knowledge among individuals and organizations. It can occur through various channels, including face-to-face communication, email, and digital platforms (Vadari & Desik, 2021.) Studies have shown that knowledge sharing is positively correlated with innovation, as it enables organizations to leverage the collective intelligence of their employees (Lee et al., 2013; Migdadi, 2020; Wang & Wang, 2012). Furthermore, IT (Information

technology) tools can extend the reach of knowledge sharing, allowing individuals to connect with a wider network of experts and access a broader range of information. IT can increase knowledge transfer by extending an individual's reach beyond formal communication lines. This can be particularly beneficial in organizations where employees may be geographically dispersed (Alavi & Leidner, 2001.)

Fourth, knowledge acquisition is the process of identifying, acquiring, and accumulating knowledge from both internal and external sources. It involves locating, creating, or discovering new information that can be applied to address various organizational challenges (Gold et al., 2001.) Knowledge can be sourced from a variety of stakeholders, including employees, other organizations, suppliers, and customers. Additionally, data and information, such as financial data, market trends, and technological advancements, can serve as valuable sources of knowledge. By effectively acquiring and assimilating knowledge, organizations can enhance their decision-making, innovation capabilities, and overall performance (Darroch, 2003.)

2.4 Knowledge management in micro-enterprises

Knowledge management in micro-enterprises fundamentally differs from large organizations due to resource constraints, informal structures, and the centrality of owner-managers in knowledge processes (Durst & Runar Edvardsson, 2012). In micro-enterprises, knowledge is the primary competitive asset, deeply embedded in professional expertise and client relationships (Løwendahl et al., 2001). However, these firms face unique challenges in transitioning from individual, tacit expertise to organizational knowledge systems. Micro-enterprises typically operate through Personal Knowledge Management (PKM) rather than formalized organizational KM systems (Durst & Zieba, 2020.) PKM refers to individual practices of creating, storing, and retrieving knowledge through personal routines, notes, and informal communication channels. In micro-enterprises, knowledge often remains "locked" in the minds of individual experts, creating significant knowledge vulnerability when employees leave or when expertise needs to be scaled (Massaro et al., 2016.) This personalized approach emerges from resource constraints: micro-enterprises lack dedicated time, personnel, and financial resources to implement formal KM systems (Durst & Runar Edvardsson, 2012).

The professional service context intensifies this challenge. Micro-enterprises who deliver customized, knowledge-intensive services, value creation occurs through direct client interaction (Empson, 2001). Knowledge in these settings is highly tacit, context-dependent, and co-created with clients during service delivery. This creates a tension between the need for documentation and the nature of expertise itself, which resists standardization (Alavi & Leidner, 2001; Empson, 2001; Nonaka et al., 2000.) In

micro-enterprises, the owner-manager serves simultaneously as expert practitioner, entrepreneur, and organizational leader. A triple role that creates significant time poverty and limits capacity for strategic knowledge development (Durst & Runar Edvardsson, 2012.) Leadership in these contexts is crucial for establishing knowledge-sharing culture and enabling digital transformation. However, digital adoption in small firms faces distinct barriers: perceived complexity, concerns about loss of control, scepticism about return on investment, and limited digital literacy (North & Kumta, 2018.) Owner-managers in micro-enterprises often pursue entrepreneurship specifically to escape corporate bureaucracy and maintain professional autonomy (Empson, 2001; Yew, 2021). This desire for independence, however, creates a paradox: while autonomy enables flexibility and client-centred service, it simultaneously hinders the development of systematic knowledge processes necessary for growth and sustainability. Some entrepreneurs resist implementing formal systems that they perceive as constraining their decision-making freedom or imposing unnecessary administrative burden (Durst & Runar Edvardsson, 2012.) This tension manifests in what can be termed "entrepreneurial bricolage", the practice of making do with available resources and improvising solutions rather than investing in structured systems (Baker & Nelson, 2005). While bricolage enables flexibility and cost-efficiency, it results in fragmented knowledge processes, redundant documentation, and time-consuming manual workarounds. The administrative burden in micro-enterprises is particularly problematic, because it diverts professional time from value-creating activities like client care to non-billable administrative tasks (Empson, 2001.)

The transition from personal to organizational KM in micro-enterprises requires several foundational changes. First, tacit knowledge must be partially explicated through documentation, templates, and standard operating procedures without eliminating the flexibility that defines expert service quality (Nonaka et al., 2000.) Second, leadership must cultivate a knowledge-sharing culture that balances autonomy with systematization. Third, technological infrastructure must be introduced incrementally, prioritizing tools that reduce rather than increase administrative burden (Jarrahi et al., 2023).
Before implementing advanced technologies such as AI-driven knowledge systems, micro-enterprises must develop basic organizational KM capabilities: consistent documentation, accessible knowledge repositories, and established routines for knowledge sharing. Without this foundation, digital tools risk becoming additional sources of fragmentation rather than solutions to knowledge management challenges (Durst & Zieba, 2020.)

2.5 Digital readiness and AI technology adoption in micro-enterprises

Trust in technology emerges as a critical precondition for AI and digital KM system adoption (Fteimi & Hopf, 2021). In professional contexts where practitioners bear legal liability for decisions,

technology must be perceived as reliable, transparent, and enhancing rather than replacing professional judgment. Small firm owners often lack exposure to successful technology implementations, relying instead on peer recommendations and observable benefits before adoption. This creates a "digital readiness gap", the distance between current informal knowledge practices and the organizational capabilities required for effective digital tool implementation (Cerchione et al., 2024.)

Digital transformation in micro-enterprises should not be viewed as a purely technological challenge. It extends beyond the mere implementation of technological tools; it represents a fundamental organizational change requiring shifts in culture, processes, and leadership practices (North & Kumta, 2018.) Digital readiness, the organizational capacity to sense technological disruptions, respond with agility, and deploy emerging technologies effectively, determines whether technology investments yield benefits or create additional complexity (Pingali et al., 2023). The Technology Acceptance Model (TAM), developed by Davis (1989), posits that technology adoption depends primarily on two perceptions: perceived usefulness and perceived ease of use. When individuals believe a technology will enhance their performance and is easy to implement, adoption likelihood increases substantially (Gefen et al., 2003). In micro-enterprises, technology acceptance faces unique barriers. Owner-managers often lack prior exposure to digital systems, relying instead on peer recommendations and observable benefits before adoption (Ramdani et al., 2013.) Perceived complexity concerns about loss of control, scepticism about return on investment, and limited digital literacy create resistance even when technologies promise efficiency gains (Durst & Runar Edvardsson, 2012). Furthermore, micro-enterprises frequently experience technology implementations as additional administrative burdens rather than solutions, particularly when systems are not designed for micro-enterprise contexts or when implementation lacks adequate training and support (North & Kumta, 2018).

Artificial intelligence represents a qualitatively different technology from traditional digital tools, requiring not only technical infrastructure but also organizational capabilities in data management, process standardization, and change leadership (Pumplun et al., 2019). Research on AI readiness emphasizes that successful adoption depends on four interdependent dimensions: people readiness (digital skills, change willingness), process readiness (standardized workflows, documented procedures), data readiness (accessible, quality data), and technology readiness (infrastructure, integration capacity) (Pumplun et al., 2019; Wamba-Taguimdje et al., 2020). For micro-enterprises, the path to AI adoption presents significant challenges. AI systems require structured data inputs, but small firms typically operate through tacit knowledge, informal communication, and improvised processes (Durst & Zieba, 2020). Without foundational KM capabilities like consistent documentation, accessible repositories, and established knowledge-sharing routines, AI implementations risk failure or may generate outputs that professionals cannot trust or validate (Jarrahi et al., 2023).

Importantly, AI adoption should be understood as augmenting rather than replacing human expertise (Jarrahi et al., 2023). In professional services, AI systems function most effectively as decision-support tools that enhance human judgment rather than autonomous systems that eliminate professional discretion. This requires what Fteimi and Hopf (2021) term "integrative AI-KM systems", configurations where AI assists with knowledge retrieval, pattern recognition, and routine documentation while professionals retain responsibility for interpretation, judgment, and client interaction.

However, leadership plays a pivotal role in shaping digital readiness and technology adoption outcomes (Li et al., 2018). In micro-enterprises, where owner-managers simultaneously serve as experts, entrepreneurs, and organizational leaders, digital leadership requires balancing competing demands: maintaining service quality during transitions, allocating scarce resources to learning and implementation, and reducing employee scepticism about technology replacing their expertise (Eller et al., 2020.) Organizations must cultivate cultures that value learning, experimentation, and knowledge sharing before introducing advanced technologies. This involves addressing "techno-scepticism" where employee beliefs that technology threatens job security, undermines professional autonomy, or introduces unacceptable risks. Leaders can reduce scepticism through transparent communication about technology purposes, involving employees in selection and implementation decisions, and demonstrating how systems augment rather than replace human capabilities (Fteimi & Hopf, 2021.) Digital transformation in micro-enterprises should follow staged progression rather than attempting comprehensive change simultaneously (Nambisan et al., 2019). Initial stages focus on digitizing basic processes, moving from paper to digital documentation, implementing customer relationship management systems, and establishing digital communication channels. Intermediate stages involve integrating systems, standardizing processes, and building analytical capabilities. Advanced stages incorporate AI and machine learning for predictive analytics, automated decision support, and intelligent knowledge systems (Cerchione et al., 2024.)

2.6 Knowledge management and digital readiness framework

Figure 2 presents the conceptual framework based on the theoretical insights. The framework positions current KM practices as the foundation upon which digital readiness is built. Four KM processes (creation, documentation, sharing, acquisition) operate within an organizational context shaped by leadership approaches, professional autonomy dynamics, and trust in technology. These organizational factors function as enablers or constraints, influencing both the effectiveness of current KM and the capacity for digital transformation.

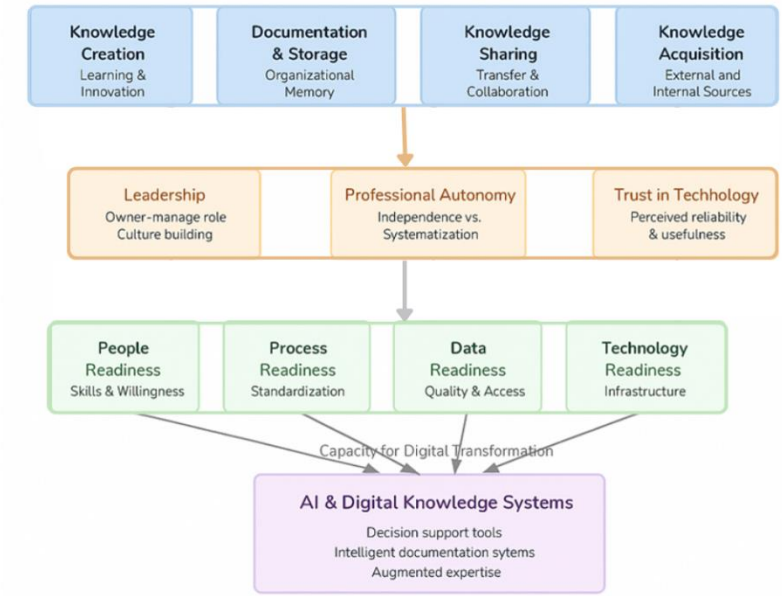


Figure 2: Knowledge management and digital readiness framework

At the top level, the framework identifies four foundational KM practices (Creation, Documentation/Storage, Sharing, Acquisition) that form the basis of organizational learning and digital readiness.

The second layer introduces organizational and cultural factors that either enable or constrain KM and digital readiness. These mediating elements influence how effectively knowledge practices are implemented. First leadership, highlighting the role of the owner-manager in shaping culture, learning orientation, and openness to innovation. Second, professional autonomy which reflects the tension between independence and systematization, affecting consistency and knowledge formalization. Third, trust in technology representing the perceived reliability and usefulness of digital tools, which drives willingness to adopt technological systems. Each of these factors has a bidirectional relationship with KM practices: they shape, and are shaped by, how knowledge is created, shared, and applied.

The third layer of the framework delineates four core dimensions of digital readiness, including the measurable indicators of an enterprise's ability to integrate technology effectively. This involves people readiness: concerns skills, attitudes, and willingness of employees and managers to engage in digital transformation. Second, process readiness which encompasses standardization and documentation of business processes, enabling automation and integration. Third, data readiness relating to data quality, accessibility, and governance, supporting evidence-based decision-making. Fourth, technology readiness focusing on infrastructure and digital tools available to support advanced

KM and AI systems. These dimensions represent the tangible aspects of an enterprise's preparedness for technological advancement.

The lower section connects the readiness dimensions to the organization's capacity for digital transformation, represented by the integration of AI and Digital Knowledge Systems. This component includes decision support tools that enhance managerial decision-making through analytics, intelligent documentation systems that automate data capture, knowledge retrieval, and workflow optimization and augmented expertise, where AI supports professional judgment and enhances service quality. This final stage embodies the transition from traditional KM practices to digitally enhanced, knowledge-driven operations.

Orange arrow emphasizes the mutual reinforcement between organizational culture and KM practice: leadership, autonomy, and trust evolve alongside knowledge processes. Gray arrows indicate how readiness and enablers contribute to higher-level KM practices and overall transformation.

This framework integrates knowledge management theory, organizational culture theory, and digital transformation models into a cohesive structure suited for micro-enterprises. It emphasizes that successful digital transformation in small veterinary firms depends not only on technical infrastructure but equally on cultural trust, leadership vision, and knowledge-centred processes. It serves as both a diagnostic tool for assessing readiness levels and a strategic guide for implementing AI-driven systems in resource-limited contexts.

3 Research methodology

This chapter describes the iterative process used to determine the necessary data for the research problem. It starts by explaining the study context and then the research approach, data collection and analysis methods.

3.1 Study context

This study investigates Knowledge Management (KM) processes within the professional context of veterinary practice, focusing specifically on independent and medium-sized clinics employing between five and twenty-four staff members. Veterinary clinics constitute a particularly salient empirical setting for examining KM because they combine features of expert-based service provision, entrepreneurial organization, and increasing technological complexity. Empirically, the study focuses on clinics located in the Turku region of Finland. This regional focus enables the contextualization of KM practices within a defined professional, regulatory, and market environment, providing a coherent basis for comparative analysis across organizational scales. The chosen context is thus well suited to examining how knowledge processes emerge, evolve, and adapt in micro-enterprises navigating digital transformation from varying levels of KM maturity.

Unlike larger healthcare organizations equipped with formalized administrative structures and institutionalized KM systems, small veterinary practices must integrate clinical expertise with business and organizational management, typically without specialized managerial or KM training (Hompas & Liang, 2025). The nature of veterinary knowledge itself further underscores the relevance of this context: it involves the synthesis of formal biomedical education and experiential, practice-based learning accumulated through diverse clinical encounters (Proctor et al., 2011). This blend of explicit and tacit knowledge makes the veterinary clinic a compelling site for exploring how professional knowledge is created, shared, and retained. Veterinary clinics also embody the tensions characteristic of many micro-enterprises, balancing professional autonomy with the collaborative demands of team-based service delivery. Individual veterinarians value independent decision-making, yet effective care depends on coordination among veterinarians, veterinary nurses, and administrative personnel (Hompas & Liang, 2025.) These dynamics highlight the interplay between individual expertise and collective organizational knowledge, a central concern in KM research.

3.2 Research approach

This study adopted a qualitative research approach to gain an in-depth understanding of the complex and context-dependent nature of knowledge management (KM) processes within veterinary clinics. The qualitative design focused on the interpretation of experiences, perceptions, attitudes, and practices (Merriam & Tisdell, 2015). Such an approach was particularly well suited to exploring the *how* and *why* questions underlying everyday knowledge practices, as it allows attention to participants' subjective meanings and socially constructed realities (Eriksson & Kovalainen, 2008).

The qualitative approach was chosen because KM in small professional settings is inherently multifaceted, shaped by individual expertise, organizational culture, and contextual factors. This methodological orientation enabled the researcher to capture the diversity of perspectives within and across clinics, revealing patterns that quantitative methods might overlook. The goal was to develop a comprehensive understanding of how knowledge is created, shared, and managed in veterinary practices of varying size and structure.

Data was analysed through a thematic logic, identifying and interpreting recurring themes that emerged from the empirical material. The research process was iterative and reflexive, involving continuous cycles of planning, data collection, analysis, and reflection. This cyclical structure supported ongoing refinement of interpretations and contributed to a more nuanced and credible account of KM practices in the studied context.

3.3 Data collection

Data was generated through one-to-one semi-structured interviews conducted with a selected group of professionals in managerial or entrepreneurial roles. The aim was to cover predefined thematic areas while allowing participants to elaborate on their experiences in their own terminology, yielding the rich, in-depth, and nuanced data essential for robust qualitative analysis.

Participants were first invited to describe their professional roles and routine tasks to establish contextual understanding of their expertise and organizational position. The diversity of these accounts was viewed as an important source of insight, underscoring the need for adaptable knowledge management (KM) processes capable of accommodating variation in functional responsibilities and workflows. Subsequent discussions explored participants' current experiences and perceptions of KM within their clinics. The interviews addressed themes such as existing challenges and successful practices, the systems and tools employed for managing information, and the ways in which knowledge is communicated, created, and shared across professional roles. In addition, participants

were asked to reflect on the role of emerging technologies, particularly artificial intelligence in veterinary practice, including whether they had experimented with AI applications and what barriers they perceived to its broader adoption.

Table 1: Participants of the interviews

Participant	Staff Size	Title / Role	Company Age
P1	1	Founder, CEO	1.5 years as entrepreneur
P2	6	Founder, Veterinarian	2 years as entrepreneur
P3	6	Founder, CEO	2 years as entrepreneur
P4	24	Operations Manager	20 years in company
P5	6	Founder, CEO	13 years as entrepreneur

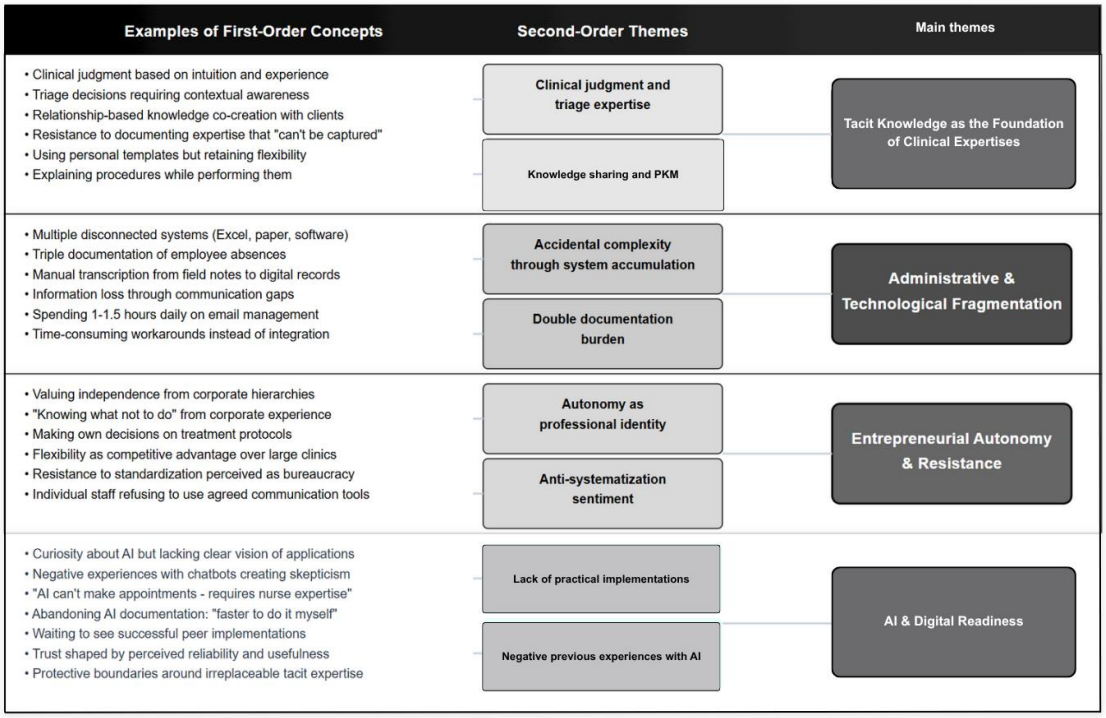
Interviews were conducted with a total of five participants, including sole practitioners and individuals from medium-sized clinics. The participants consisted of individuals in executive or proprietary roles, specifically clinic owners and operational managers. The interviews were primarily conducted face-to-face, with one instance being facilitated via a phone interview to accommodate participant availability. All preliminary communication and scheduling were managed through email correspondence. To ensure data fidelity and accessibility for the international academic audience, interviews were conducted in Finnish and subsequently transcribed and translated into English for analysis.

The research adhered to strict ethical guidelines, prioritizing the creation of a safe and non-judgmental environment to facilitate honest and rich disclosure. Prior to the interviews, participants were fully informed of their rights, including the voluntary nature of their participation and the confidentiality and anonymity guaranteed to all shared data. A relaxed atmosphere was cultivated using open-ended questions and a conversational approach to encourage constructive discussion and the uninhibited sharing of both existing practices and novel ideas. This was particularly important for a KM study, as the most valuable insights often pertain to tacit knowledge and the informal processes that emerge in a trusting environment.

3.4 Data analysis

A thematic analysis was utilized to analyse the collected data from interviews. Literature guided specific themes related to KM practices. However, it was necessary to remain open to new subjects that might emerge from the data.

Table 2: Thematic analysis process



At the beginning of the analysis process, all audio-recorded interviews were transcribed using Microsoft Word's transcription tool, resulting in a total of 66 pages of textual data. The transcription process enabled the researcher to become deeply familiar with the material, facilitating preliminary observations and reflections.

Thematic analysis was then employed to systematically examine the data. In the initial phase, the transcripts were reviewed and condensed to include only statements directly relevant to the research questions. The refined dataset was subsequently analysed in greater depth to identify recurring ideas, patterns, and relationships. A coding framework was developed to categorize the data according to salient keywords, phrases, and conceptual meanings. Through iterative coding and comparison, key themes and insights were distilled from the empirical material. From this process, four central themes emerged: (1) tacit knowledge as the foundation of clinical expertise and competitive differentiation, (2) administrative and technological fragmentation, (3) entrepreneurial autonomy and resistance to systematization, and (4) digital trust and barriers to AI adoption. Sections of the transcriptions were underlined in Word, according to the topic in question. Individual sections were then scrutinized in more detail to find out the underlying answers to the questions.

3.5 Research evaluation and limitations

This research adopts a post-positivist philosophical stance, recognizing the importance of researcher reflexivity and their own biases and limitations (Eriksson & Kovalainen, 2008, pp. 18–19). By striving for transparency in the research process, the study aims to mitigate the potential impact of subjectivity on the findings, ensuring credibility and trustworthiness. The reliability and validity of the study were sought to be ensured throughout the entire research process. The researcher was aware of their own preconceptions and their potential impact on the study. Thus, the data in any research is always interpreted, meaning that it does not represent pure reality (Merriam & Tisdell, 2015, p. 242.) Because of the nature of qualitative research, the findings of a study may vary even if conducted in identical environments with the same participants, as the social world and human behaviours are inherently dynamic. Interviews were arranged in a way that the researcher and the interviewee were unfamiliar with each other, minimizing subjectivity. For the success of the study, it was essential that the researcher listened carefully to the interviewees and clarified any ambiguities. To ensure a diverse dataset, interviewees were carefully selected to obtain the most comprehensive picture possible of the company's KM practices. Limitation of the study is the small number of interviewees, which may limit the generalizability of the results.

To enhance the study's credibility, the researcher immersed themselves in the field of KM. This involved extensive reading of academic articles, studies, and relevant theories. Drawing on prior work experience, the researcher was already familiar with certain contextual factors. Interviews were recorded and transcribed to maintain accuracy. The researcher's relative inexperience in academic research may have influenced the quality and fluidity of data collection and analysis, potentially impacting the overall dependability of the study.

The collected data and the interviews were held in Finnish. The citations used in this study were translated from Finnish to English using Word translate tool. However, using a translator in interviews poses challenges for the study's credibility. The data is not directly collected from the interviewee but is filtered through the translator. The study has followed ethical guidelines carefully. All personal data has been handled confidentially and anonymized. Participants were informed about the study and their rights prior to participation. Participation was voluntary, and participants had the right to withdraw at any time. Verbal consent was obtained from participants during the interviews. Interviews were recorded with the participants' permission, and the data was stored securely. Interviews and their transcripts will be stored for five years after the publication of the thesis, after which they will be destroyed. The data is confidential and will not be shared with third parties. The anonymity of the interviewees and the target company is guaranteed. The research data has been handled confidentially, and the identities of the participants have been protected using code names. The research does not

reveal any confidential information, and neither the participants nor the company they represent can be identified from the research data. The dataset employed in this research was sourced from Finland, restricting the applicability of the analysis to other regions. The results may not be directly transferable to diverse cultural, economic, and technological contexts.

The study made use of several artificial intelligence–based tools to support different stages of the research process. Google Gemini AI and ChatGPT were employed to enhance the clarity and coherence of written text, particularly in tasks related to information structuring, linguistic refinement, and summarization. These tools were applied as supplementary aids to improve the presentation of ideas, while all analytical interpretations and conclusions remained the responsibility of the researcher. In the early stages of the research, AI tools were also used for exploratory purposes, assisting in the organization of thematic structures. In addition, the Scopus AI tool provided by the University of Turku was utilized to facilitate literature searches and to identify relevant peer-reviewed studies for theoretical grounding. Collectively, these digital tools supported the efficiency and rigor of the research process without substituting for the researcher’s critical judgment or analytical reasoning.

4 Findings

This chapter presents the empirical findings of the study, which explored how small veterinary clinics manage and share knowledge, what factors enable or hinder these processes, and how readiness for artificial intelligence (AI) and digital knowledge systems manifests in these contexts. The findings are based on the thematic analysis of five semi-structured interviews with clinic owners and managers representing small veterinary practices of varying size and specialization.

4.1 Tacit knowledge as the foundation of current KM practices

The first research question explored how small veterinary clinics currently manage and share knowledge in daily operations. Veterinary clinicians develop highly specialized tacit knowledge through years of practice. Tacit knowledge emerged as the primary asset in veterinary practice, manifesting most clearly in clinical judgment and triage decision-making. The veterinarians demonstrated sophisticated awareness that their competitive differentiation rested precisely on contextual judgment, relationship-building capacity, and flexible problem-solving that resist standardization.

Participants described clinical decision-making as dependent on intuition and situational awareness rather than standardized protocols. P2 explained how flexibility and experience enabled rapid, cost-effective care compared with larger clinics:

> "We're flexible. It's the time that's reserved for you... if [the customer] had gone to a big hospital now, for example, this diabetic cat, I would have considered it the health checker and said that OK, something wrong with these, a new appointment is booked... We can start the treatment faster with that animal more cost-effectively, the customer is likely to be much more satisfied." (P2)

This example illustrates tacit knowledge in action: the ability to assess case complexity, allocate appropriate time resources, and make real-time adjustments to treatment protocols. Triage requires nurses to evaluate symptoms described by owners, estimate required consultation duration, and determine urgency; skills developed through years of experience that resist standardization. As well these small clinics described their service model as fundamentally relationship-based, where knowledge is co-created through ongoing interaction with clients. Solo practitioner P1 noted the contrast with larger clinics where tasks are divided among staff:

> "When I take those labs, I can at the same time explain to the person what I'm doing and why. And then, in a way, the explanatory phase is left out, because I'm kind of there all the time I'm able to communicate." (P1)

P1's articulation of how flexibility enabled superior care compared to larger facilities reflected deep understanding that the clinic's value proposition depended on maintaining knowledge in tacit form. The continuous presence enables integrated knowledge creation where the veterinarian simultaneously performs procedures, observes patient responses, educates the owner, and adjusts treatment plans. This holistic approach, characteristic of micro-enterprises, creates tacit knowledge that is deeply contextual and resistant to fragmentation into discrete, transferable tasks. This strength, however, creates tension between tacit knowledge and the growing demand for documentation. Participants expressed frustration that legal and quality requirements force them to formalize knowledge that inherently resists codification. P1 articulated the documentation burden:

> "…you just have to write every single thing you've ever hinted at to the owner... most of our time is spent on actually writing everything there [patent record system] …in a way, that it doesn't really matter when it comes to the animal's well-being, whether it's all recorded or not." (P1)

This tension reveals a fundamental paradox: legal and quality requirements demand explicit documentation, yet the essence of expertise, clinical judgment, intuition, relationship building cannot be fully captured in text. P1's frustration that documentation feels "useless" for animal wellbeing captures awareness that writing about judgment differs categorically from exercising it.

Regulatory frameworks demand explicit documentation that expertise actively resists. The template-based approaches participants developed represent pragmatic compromises: capturing routine patterns while acknowledging templates cannot encompass clinical judgment's full range. This reveals that veterinarians selectively externalize knowledge components amenable to documentation while protecting the tacit core defining their competitive value.

> "I use standard texts I have made. I wrote the templates myself and then I just click from there that if I have an eye patient, it will be like the basic text." (P1)

Clinic owner P3 and P5 similarly created "ready-made answers" for common email inquiries. This represents partial knowledge codification, capturing recurring situations and responses in reusable formats. However, templates remained individually created and managed rather than organizationally

developed and updated. This limits their utility for training new staff or ensuring consistency across practitioners.

These clinics operated on through Personal Knowledge Management, which is typical for Micro-enterprises, rather than formalized organizational KM systems (Durst & Zieba, 2020). For example, all the participants emphasized WhatsApp as their primary internal communication channel and phone, email and website booking system as the main communication channel with customers. These individualized systems work well for solo practitioners but create challenges for clinic growth. When clinics employ multiple veterinarians, inconsistent documentation practices and communication channels fragment organizational knowledge. Clinic manager P4 described communication breakdowns:

> "…there have been a few of these situations where something is happening at the clinic right now, which should have been informed to everyone who stays on that day's evening shift and then it has been left undone and then when it has caused problems." (P4)

The challenge lies in developing hybrid approaches that preserve tacit knowledge's strategic value while creating sufficient documentation for operational continuity. Equine clinic owner P5 identified commitment to agreed practices as a persistent challenge:

> "People don't commit to such agreed practices, that when they say that you don't always do it this way. But then someone doesn't always do it... when we have a patient on the card, we always write a note about the calls... then someone doesn't do it." (P5)

These examples illustrate the tension between autonomy (allowing individuals to work their own way) and organizational reliability (ensuring consistent practices). Without formalized knowledge management, quality depends entirely on individual discipline and memory. This informal approach works effectively in micro-settings where all staff interact daily. However, it creates challenges for knowledge retention and transfer to new employees. Knowledge exists in conversations and shared experiences rather than documented repositories accessible for learning or reference. P5 described their practice:

> "We are such a small work community. There are basically like 4 of us... we do see each other practically every day." (P5)

Knowledge sharing occurred primarily through informal, synchronous interaction rather than formal systems. As P1 described, integrating laboratory work and client explanation exemplifies knowledge co-creation “in action.” However, this informality created vulnerabilities. When staff failed to document calls or share urgent updates, information was lost, leading to operational risks. As Durst and Runar Edvardsson (2012) observed, informal systems “work until they don’t”: they depend on proximity and memory, making knowledge continuity fragile when staff are absent or leave.

Knowledge sharing challenges intensify as clinics grow beyond solo practice. While informal face-to-face communication works for 2-3 people, it becomes unreliable with 5-10 staff members working different shifts. Yet participants lacked formal systems for ensuring critical information reaches appropriate recipients, like P4 continued:

> "…we have a few of the staff who don't want to use WhatsApp, for reasons of principle to use it, so then the messages don’t reach everyone. They don’t get that information always and then just sometimes in a hurry I forget to say it verbally face-to-face." (P4)

This reveals that even basic digital communication tools face adoption barriers when individuals perceive them as invasive or unnecessary. Voluntary participation undermines the reliability of digital channels for critical information sharing.

4.2 The main barriers and enablers to effective KM

The second research question examined what hinders or facilitates effective KM in small veterinary clinics. Findings revealed administrative fragmentation, time poverty, and autonomy paradoxes as dominant barriers, while continuous improvement orientation acted as a modest enabler.

The most pervasive barrier was administrative and technological fragmentation. Multiple disconnected systems, redundant processes, and inefficient documentation routines. Clinics used combinations of Excel files, paper notes, patient record systems, and messaging apps without integration. The triple documentation of employee absences described by P4 illustrates this “accidental complexity”:

> “We have the occupational health care where we have to record the days and reasons for absence... but we keep records of that and in addition to having our own records... and there is another paper in the dressing room where everyone then marks them with a pen… but there are like 3 places [paper documents] where the information can be found…” (P4)

Each layer served a specific purpose, yet collectively they created inefficiency rather than clarity. Documentation requirements driven by legal liability consume time that could be spent on core expertise, taking care of the animals. All participants described significant administrative burdens stemming from fragmented manual processes. It was seen as significant bottleneck across all interviews for knowledge creation and sharing. Considering the nature of the veterinary work, technical solutions just are not practical, like P5 stated:

> "When we visit the stables, we make the notes in a notebook as we were sitting by the horse and then we do the papers at the clinic based on those notes. Because you could not really take the computer when it's cold and humid, especially when we're heading towards winter, the computer batteries don't work." (P5)

This double-entry system handwritten notes followed by digital transcription, represents a rational adaptation to environmental constraints but creates inefficiency and potential for information loss. Nurses attempted to optimize by completing digital records during car rides, but fundamental fragmentation persists between field knowledge creation and system documentation. Technologies intended to streamline processes instead of adding fragmentation when systems failed to integrate with existing workflows. The equine clinic's double-entry system, handwritten field notes followed by digital transcription, illustrates rational adaptation to environmental constraints that nonetheless creates inefficiency. This demonstrates that fragmentation stems not simply from poor planning but from legitimate practical challenges. Effective KM solutions for micro-enterprises must accommodate such constraints, designing for actual professional work rather than idealized workflows.

Also, on big barrier was time scarcity, which compounded fragmentation. Participants described spending over an hour daily on email and significant portions of their clinical day on documentation. P3 observed:

> “That e-mail is actually quite busy at the moment… it suddenly takes an hour and a half in a day…” (P3)

This observation underscores a structural issue: owner–managers remain deeply embedded in operational tasks, leaving limited capacity for strategic oversight or the development of formalized knowledge-management routines. The empirical material suggests that time scarcity and fragmentation do not operate as isolated barriers; rather, they form a self-reinforcing cycle. High administrative load disperses attention, which in turn inhibits the establishment of structured processes, thereby perpetuating the very fragmentation that generates time scarcity in the first place.

Theoretically, this points to an important mechanism hindering KM maturity: fragmentation is not merely a symptom of underdeveloped practices but a dynamic condition that reproduces itself.

Knowledge sharing

Also, knowledge sharing not merely as a practical necessity, but as a widely recognized core principle of supervisory and leadership practice. The implication is that disruptions, bottlenecks, or inconsistencies in communication are likely to reverberate across other knowledge-related activities, including coordination, decision-making, and knowledge retention.

P5 highlights the importance of information flow:

> "…with in all the trainings what I've done on supervisory work and leadership, it was said that if anything, it's always the flow of information." (P5)

Theoretically, P5's emphasis supports the interpretation that knowledge management challenges in micro-enterprises are often rooted in communication dynamics rather than technology or formal processes alone. When information is not transmitted consistently or efficiently, organizations struggle to maintain shared situational awareness, which in turn limits their capacity to develop structured knowledge practices. Participants highlighted that insufficient information flow happens because of the hurry, lack of formalized knowledge management practises and the nature of the job where the time is spent with clients. Clinic manager P4 emphasized the challenge of urgent communication:

> "…the fast flow of information is sometimes kind of challenging. Just the communication that comes to everyone in a hurry, if something is happening right now, everyone should know." (P4)

Owner-managers face immediate demands: client emails, patient records, staff schedules, that preclude stepping back to redesigning workflows. The result is a competency trap: existing practices consume the very resources needed to develop better practices.

Entrepreneurial Autonomy

Entrepreneurial autonomy emerged as a defining feature of small veterinary clinics. Participants valued independence from corporate hierarchies and protocols. P1 explained:

> "When you're working for someone else... you have to follow their instructions. And now that I get to decide for myself, I get to be flexible." (P1)

Autonomy empowered practitioners to customize service and build client trust, echoing Empson's (2001) argument that professional service success depends on expert discretion. Yet this same autonomy hindered KM standardization. As Yew (2021) and Durst & Runar Edvardsson (2012) note, tacit knowledge in small firms often remains embedded in individuals, resisting transformation into organizational routines. Participants associated formal systems with the bureaucracy they deliberately left behind. P3 reflected:

> "We know what not to do, we have all been there in big corporations... we want to have our own cozy place." (P3)

In these clinics, owners valued their independence while needing structure, it captures why even beneficial KM systems face resistance from the leadership level. This entrepreneurial motivation creates a paradox: while participants escaped corporate systems to gain autonomy, they now face the need to implement systematic processes for efficiency and scalability. However, any systematization feels like recreating the bureaucracy they sought to escape. Therefore, participants developed PKM strategies adapted to their individual preferences.

Despite these barriers, some participants demonstrated awareness and willingness to improve systems. P3 described "looking for development all the time," while P4 mentioned exploring HR management software. The limitation is not motivation but lack of blueprints compatible with small-scale realities and professional autonomy.

4.3 AI and digital knowledge readiness

The third research question examined how readiness for AI and digital knowledge systems manifests in small veterinary clinic contexts. The findings indicate that digital readiness is fragmented, cautious, and primarily cognitive and cultural rather than technical. In these clinics, readiness manifests through selective curiosity, conditional trust, and pragmatic experimentation rather than through formal strategies or infrastructure.

Most participants expressed curiosity about digital and AI technologies but lacked concrete understanding of their potential applications in clinical or administrative work. As P4 admitted:

> “I don't really know exactly what it could be used for. But yes, it is interesting... I can't really say yet. So, I haven't used it before.” (P4)

This illustrates an early, exploratory stage of readiness characterized by low awareness but positive interest. Technology is viewed as a tool for solving immediate problems rather than as a driver of strategic change. Participants were open to experimentation but had not yet developed a clear vision of how AI could support veterinary knowledge work. Readiness manifested not as enthusiasm or resistance in isolation but as a function of digital trust that technology will perform reliably and align with professional values. Participants’ trust was shaped by prior experiences with unreliable automation. P3 described frustration with customer-service chatbots:

> "I personally find it annoying, for example, when I chat robots like a bank chatbot, you put a message there, then it doesn't understand you. If it happens like 3 times it happens, then it I lose my nerves." (P3)

These negative encounters generalized into broader scepticism toward AI. AI–KM integration depends on demonstrated reliability and transparency. Since most participants lacked positive experiences with trustworthy systems, their cautious attitude reflects rational scepticism rather than technophobia. These negative experiences with rudimentary automation created scepticism about more advanced AI applications, like the participants questioned AI's ability to handle tasks requiring tacit knowledge and contextual judgment. Equine clinic owner P5 explained why AI appointment booking wouldn't work:

> "They can't make appointments for us, because no random person can make appointments, but it has to be our nurse who knows all the required things. In a way, they would need to know what it is when the owner tells them what they might need and how much they need to reserve for such a time." (P5)

In the clinic context, readiness thus manifests as protective differentiation. For example, P5 explained that AI is used to create images for marketing materials at their clinic, because then they don’t have to worry about copyrights. AI is welcomed for supportive, low-risk tasks but resisted when it threatens professional expertise. But to consider, most participants had minimal direct experience with AI, limiting their ability to envision beneficial applications. It was merely personal if they had investigated and tried to learn how it could be utilized.

In this context, AI adoption fails when systems attempt to automate tasks that fundamentally require human expertise and judgment. In veterinary clinics, appointment scheduling, and treatment planning involve tacit knowledge that current AI systems cannot replicate.

Notably, when clinics trailed AI for patient documentation, participants reverted to manual methods. Equine clinic owner P5 explained:

> "We have a trial on AI in the patient records system... but somehow when we have ready-made templates for many visits, I feel that the fact that I write the papers myself then at least I know what I have written there and somehow it is faster just to do it yourself." (P5)

This reveals that AI must demonstrably save time and improve quality to gain adoption. When AI-generated text requires extensive editing or verification, practitioners perceive it as creating additional work rather than reducing burden.

The study also found that readiness for AI presupposes foundational KM maturity: Structured data, documented processes, and integrated systems. In most clinics, knowledge remained embedded in individual practices and fragmented records. As Jarrahi et al. (2023) argue, AI can only augment human expertise when organizational knowledge is already externalized and accessible. Without that foundation, AI cannot meaningfully contribute to decision-support or learning.

5 Discussion

This chapter interprets the empirical findings in relation to existing knowledge management literature, examining how the experiences of Finnish veterinary clinics illuminate broader patterns in micro-enterprise knowledge management and digital readiness. The discussion addresses each research question systematically while developing connections between the observed practices and theoretical frameworks introduced in Chapter 2.

5.1 KM practices micro-enterprises

The findings reveal a knowledge management landscape dominated by what Durst and Zieba (2020) characterize as Personal Knowledge Management (PKM) where individual practitioners develop personalized routines, templates, and communication preferences rather than participating in formalized organizational systems. This pattern aligns with prior research on KM in micro-enterprises. Massaro et al. (2016) noted that small firms typically lack dedicated KM resources, leading to informal, ad hoc approaches to knowledge creation and sharing. The present study extends this understanding by showing how professional expertise amplifies reliance on PKM.

Veterinary clinics studied here derived competitive advantage from tacit knowledge: clinical judgment, triage expertise, and relationship-based care developed through years of practice. This aligns with Nonaka et al.'s (2000) conceptualization of tacit knowledge as deeply embedded in individual experience and resistant to codification. However, while Nonaka's SECI model emphasizes conversion between tacit and explicit knowledge as the engine of organizational learning, the present findings suggest inherent limits to this conversion in micro-enterprise contexts. This strategic positioning aligns with Løwendahl et al.'s (2001) argument that micro-enterprises compete fundamentally on knowledge quality. However, the veterinary context reveals an additional dimension: practitioners actively resist certain forms of knowledge codification from accurate recognition that excessive documentation would undermine the expertise clients value.

Small teams relied on daily face-to-face communication, spontaneous discussion, and mutual observation. As Alavi and Leidner (2001) distinguished, knowledge is the ability to apply information, while information is factual content detached from context. The veterinarians' frustration reflects this distinction: writing about clinical reasoning is not equivalent to exercising it. Many participants adapted by creating standardized templates in their patent record system partially address this issue, capturing recurring patterns, but as P1 explained, they never encompass the full richness of judgment required in clinical work.

The frustration expressed by participants regarding documentation requirements reflects a deeper tension: legal and regulatory demands for explicit records conflict with the irreducibly tacit nature of professional expertise (Alavi & Leidner, 2001). This tension between tacit expertise and documentation pressure extends Løwendahl et al.'s (2001) argument that micro-enterprises compete primarily on knowledge quality. The veterinary clinics understood intuitively that their differentiation strategy centred on personalized care and flexible problem-solving, capabilities rooted in tacit knowledge. Yet this strength creates vulnerability. When knowledge remains embedded in individual practitioners, organizational continuity depends entirely on individual retention. Massaro et al. (2016) observed that micro-enterprises typically lack mechanisms for transforming personal expertise into organizational memory, and the present study confirms this pattern while revealing its root cause, not merely resource constraints, but active resistance to systematization perceived as threatening professional autonomy and the quality of personal customer service.

The dominance of Personal Knowledge Management (PKM) observed across all participating clinics challenges conventional KM maturity models that position informal practices as deficiencies to be corrected through formalization. Durst and Zieba (2020) characterized PKM as individual routines for creating, storing, and retrieving knowledge through personalized methods. The present findings suggest that in micro-enterprises, PKM represents not immaturity but deliberate strategic adaptation to entrepreneurial values and service delivery requirements. Participants developed sophisticated PKM strategies like customized templates for common procedures, strategic use of multiple communication channels, and flexible allocation of time resources based on tacit assessment of case complexity. These practices enabled the responsiveness and personalization that differentiated them from larger competitors.

Brown and Duguid (1998) emphasized that knowledge emerges from social interactions within work communities, and the small veterinary clinics exemplified this principle through daily face-to-face knowledge exchange. The limitation of such informal approaches becomes apparent only when attempting to scale beyond the immediate work community or when key individuals depart.
This insight problematizes linear progression models that assume all organizations should evolve from ad-hoc toward formalized KM systems (North & Kumta, 2018). The veterinarians studied here did not lack awareness of systematization benefits; rather, they consciously prioritized autonomy and flexibility over consistency and scalability. This choice reflects what Baker and Nelson (2005) termed entrepreneurial bricolage, making do with available resources through creative improvisation.
However, while bricolage enables resource efficiency, it produces fragmentation when applied to knowledge processes: multiple disconnected systems, redundant documentation, and knowledge trapped in individual minds.

The PKM-to-organizational-KM transition described by Massaro et al. (2016) is thus not merely a scaling challenge requiring additional resources. It represents a fundamental cultural transformation that conflicts with the entrepreneurial identity driving many professionals to establish independent practices. Empson (2001) noted that experts often pursue entrepreneurship specifically to escape corporate bureaucracy and maintain professional autonomy. All participants highlighted this one of the core reasons why they established their own clinics. The present study extends this insight by showing how this escape creates a new dilemma: the very independence that enables quality service ultimately constrains growth and sustainability when tacit knowledge cannot be effectively transferred to colleagues or successors.

5.2 Administrative and technical fragmentation

A particularly striking finding concerns the extent of administrative fragmentation in small veterinary practices. The accumulation of disconnected systems: patient management software, Excel spreadsheets, paper forms, email chains, messaging apps, contradicts idealized depictions of integrated KM infrastructure (Lee et al., 2013). Each system emerged from legitimate needs: regulatory compliance, payroll processing, client communication, internal coordination. However, the participants independent evolution created what might be termed "accidental complexity", inefficiency resulting not from poor planning but from incremental addition of workarounds without integration. This fragmentation imposes what Empson (2001) identified as a critical burden in micro-enterprises. Administrative tasks that divert expertise from value-creating activities. The veterinarians spent substantial time on documentation, email management, and manual data transfer between systems, time that could otherwise be devoted to clinical care or professional development. North and Kumta (2018) observed that digital transformation in small organizations often increases rather than decreases complexity when new systems fail to integrate with existing workflows. The present findings provide empirical support for this observation while revealing its mechanism: resource-constrained firms adopt technologies reactively to address immediate problems rather than strategically to transform capabilities. Durst and Runar Edvardsson (2012) identified resource scarcity as fundamental to SME knowledge management challenges. This study adds specificity: in small professional contexts, time scarcity creates a reinforcing cycle where lack of systematic processes generates administrative burden, which consumes the time required to develop better systems. Entrepreneurs facing urgent client demands and compliance deadlines cannot allocate attention to process improvement. This dynamic explains why continuous improvement orientation observed in several participants failed to translate into substantive systematization. Not from lack of motivation, but from structural constraints on available time and attention.

5.3 Entrepreneurial autonomy and resistance to systematization

Perhaps the most theoretically significant finding concerns the relationship between entrepreneurial autonomy and knowledge management systematization. All participants valued independence from corporate hierarchies and standardized protocols. This autonomy enabled the personalized, relationship-based service differentiating them from larger competitors. However, this same autonomy became problematic when scaling beyond solo practice or attempting to implement consistent knowledge processes.

Baker and Nelson's (2005) concept of entrepreneurial bricolage helps interpret this paradox: rather than integrating, clinics added workarounds for each new administrative requirement, producing the opposite of bricolage. This fragmentation contradicts idealized depictions of integrated KM systems (Lee et al., 2013). Yew (2021) noted that tacit knowledge transformation poses challenges in small firms where knowledge remains embedded in individual practice rather than organizational routines. The present study confirms this pattern while revealing its cultural foundation: entrepreneurs resist systematization because they associate formal systems with the corporate bureaucracy they deliberately escaped. One participant's statement about "knowing what not to do" from corporate experience reflects scepticism that extends even to beneficial systematization.

This resistance has deeper roots than resource constraints or lack of awareness. It reflects identity concerns central to professional entrepreneurship. When veterinarians establish independent practices, they are not merely creating businesses; they are asserting professional identity and values against corporate standardization. Systematizing knowledge processes feels like recreating the bureaucracy they rejected, even when such systems would improve efficiency and reduce administrative burden. This insight extends Durst and Runar Edvardsson's (2012) observation that SME knowledge management faces unique cultural challenges by showing how professional identity actively shapes those challenges.

5.4 Digital readiness as cultural transformation

The findings regarding digital and AI readiness challenge purely technological conceptualizations of digital transformation. Participants exhibited curiosity about digital tools but lacked concrete understanding of potential applications. More significantly, their readiness was fundamentally shaped by trust or lack thereof in technology's reliability and alignment with professional values.
Li et al. (2018) distinguished between reactive and proactive digital orientations, with the latter characterized by envisioning technology-enabled futures and mobilizing organizations toward them. The veterinary clinics demonstrated primarily reactive orientation: technology was viewed as potential

solution to existing problems rather than enabler of new capabilities. This pragmatism reflects the entrepreneurial bricolage mindset, making do with available resources rather than investing in speculative infrastructure (Baker & Nelson, 2005.) While practical for resource-constrained contexts, this approach limits digital maturity development because it prevents the foundational investments required for advanced applications like AI-driven knowledge systems.

Digital trust emerged as critical for adoption decisions. Fteimi and Hopf's (2021) argument that AI-KM integration depends on demonstrated reliability and transparency found strong empirical support. Participants' negative experiences with rudimentary automation (chatbots that misunderstand queries, systems requiring extensive manual correction) generalized into scepticism about more sophisticated AI applications. Gefen et al. (2003) emphasized that trust develops through consistent positive experiences; the veterinarians lacked such experiences, making their caution rational rather than technophobic. Importantly, participants correctly assessed that current AI cannot replicate the tacit knowledge driving their competitive advantage. The appointment booking example provided by P5 illustrates why certain AI applications fail in professional service contexts. Jarrahi et al. (2023) argued that effective human-AI collaboration requires clear division of labour between algorithmic and human tasks.

This finding has theoretical significance for digital readiness frameworks. Pumplun et al. (2019) and Wamba-Taguimdje et al. (2020) identified technical dimensions: infrastructure, data quality, process standardization as prerequisites for AI adoption. The present study suggests that cultural and managerial readiness precedes technical implementation. Before micro-enterprises can effectively deploy AI-driven knowledge systems, they must develop foundational organizational KM capabilities: documented processes, accessible repositories, and established knowledge-sharing routines. Without this foundation, AI implementations risk failure because the knowledge these systems would leverage remains locked in individual minds and fragmented across disconnected systems.

5.5 Theoretical implications

This study makes several contributions to knowledge management literature, particularly regarding micro-enterprises, professional service firms, and digital transformation in resource-constrained contexts. Existing KM maturity models typically assume a linear progression from ad-hoc practices toward formalized systems, with higher maturity equating to better organizational outcomes (North & Kumta, 2018.)

First, the findings suggest that Personal Knowledge Management (PKM) is not simply an immature stage to be overcome but rather a deliberate strategic choice aligned with entrepreneurial values and service delivery models. The PKM-to-organizational-KM transition described by Massaro et al. (2016) is not merely a scaling challenge but a cultural transformation that conflicts with entrepreneurial identity. Previous literature emphasized resource constraints, but this study reveals how autonomy preservation actively resists systematization even when resources permit. Supported by the bricolage theory the veterinary clinics studied demonstrated sophisticated knowledge practices like customized templates, strategic communication channel management, and effective tacit knowledge application, despite lacking formalized organizational KM systems (Baker & Nelson, 2005). This suggests the need for alternative maturity frameworks that evaluate KM effectiveness relative to organizational context rather than against universal standards.

Second, the findings extend understanding of tacit knowledge in professional services. Nonaka et al.'s (2000) SECI model emphasizes conversion between tacit and explicit knowledge, but the veterinary context reveals limits to this conversion. Clinical judgment remains stubbornly tacit not because practitioners refuse to share but because the knowledge itself resists codification. This suggests that KM frameworks should acknowledge irreducible tacit knowledge rather than assume all expertise can ultimately be documented. This reasoning aligns with Davis's (1989) Technology Acceptance Model: technologies perceived as low in "usefulness" and "reliability" generate resistance. The veterinarians' boundary-setting also reflects Jarrahi et al.'s (2023) concept of human–AI complementarity, where readiness depends on recognizing which knowledge tasks can be delegated to machines and which require human judgment.

Third, digital transformation in micro-enterprises requires staged progression respecting both resource constraints and cultural values. Nambisan et al. (2019) emphasized incremental digital maturity development, and the present findings strongly support this approach. Small professional firms should prioritize reducing administrative burden through better system integration before attempting AI implementation. This sequencing respects both practical constraints (limited time and capital) and cultural values, preserving professional autonomy while gradually building trust in technology.

Finally, the research highlights how administrative burden undermines knowledge management in micro-enterprises. The literature emphasizes knowledge creation and sharing, but Empson's (2001) observation about time diverted from value creation deserves more attention. For the veterinarians studied, inefficient knowledge processes did not primarily prevent learning or innovation, they prevented spending time with animals and clients. This reframes the KM value proposition: effective systems matter not only for competitive advantage but for professional fulfilment. A micro-enterprise with excellent PKM practices and 95% client satisfaction may be more "mature" in meaningful ways

than a larger firm with elaborate but underutilized KM infrastructure. This reconceptualization has implications for how researchers evaluate KM success. Rather than measuring system sophistication or documentation volume, effectiveness metrics for micro-enterprises should assess knowledge accessibility when needed, reduced time spent on administrative tasks, and successful knowledge transfer to new team members, outcomes rather than processes.

5.6 Future research

This study opens several directions for future research on knowledge management in micro-enterprises and AI adoption contexts. First, longitudinal research tracking micro-enterprises as they grow from solo practice through various stages would clarify whether the patterns observed here represent stable characteristics or transitional states. Such studies could examine how KM practices evolve when firms add employees, what triggers transitions from PKM to organizational KM, and whether resistance to systematization softens or becomes entrenched over time. Understanding these developmental trajectories would inform when and how to intervene to support effective KM development.

Second, comparative studies across different professional service sectors would test the generalizability of findings. This research focused on veterinary clinics with unique characteristics such as mobile work requirements and emotional client involvement. Examining legal practices, accounting firms, dental clinics, and consulting would reveal whether the tacit knowledge types, autonomy values, and digital trust barriers identified here apply broadly or reflect veterinary-specific factors. Such comparisons would refine theoretical understanding of micro-enterprise KM dynamics.

Third, intervention research is needed to develop and test approaches for building digital trust and facilitating AI adoption in micro-enterprises. The study identified trust as a critical barrier, yet little guidance exists for how to build appropriate confidence in AI-KM systems. Action research collaborating with professional service firms to co-design AI tools, test staged adoption approaches, and evaluate peer learning networks could generate practical insights while advancing theory on technology acceptance in resource-constrained contexts. Also, empirical research on hybrid human-AI knowledge management models would address how AI-human partnerships function when resources for extensive customization are limited. Questions include what division of labour optimizes both efficiency and professional satisfaction, how AI can augment rather than replace tacit knowledge, and how professionals adapt their practices when AI handles routine KM tasks. Mixed-method approaches combining system design with qualitative investigation of professional experience would illuminate effective collaboration models.

These research directions would collectively advance understanding of knowledge management in contexts characterized by resource constraints, professional expertise, and entrepreneurial values. Such research serves both theoretical development and practical application, helping micro-enterprises navigate digital transformation while preserving the autonomy and expertise that drive their success.

6 Conclusion

This study examined how veterinary clinics in Finland manage, share, and store knowledge in their everyday operations and how these practices affect their readiness to adopt digital and AI-based systems. These findings suggest that effective digital transformation in micro-enterprises requires addressing cultural and managerial foundations before implementing technological solutions. KM practices in small veterinary clinics remain predominantly personal, informal, and tacit-knowledge-based. Their knowledge management is personal rather than organizational, constrained by time, resources, and a desire for autonomy. Tacit knowledge constitutes the primary competitive advantage but creates significant challenges for scaling, training, and succession planning. Clinical judgment, triage expertise, and relationship-based care resist codification yet require transmission to new practitioners. The findings collectively reveal what might be termed the "micro-enterprise KM paradox": the characteristics that enable micro-enterprises to deliver high-quality, personalized service simultaneously prevent development of the systematic knowledge management required for sustainable growth and digital transformation.

This paradox has implications for both practice and theory. Study found that administrative and technological fragmentation creates substantial inefficiency in micro-enterprises. This "administrative tax" diverts expertise from value-creating clinical work to compliance and coordination activities. Informal communication works effectively in small teams but becomes unreliable as firms grow. This tacit expertise creates competitive advantage but resists scaling. Autonomy enables professional judgment but hinders standardization. Entrepreneurial bricolage conserves resources but creates fragmentation. It creates resistance to the very systematization that would improve efficiency. Participants perceive formal systems as threatening their flexibility and recreating corporate bureaucracy they explicitly sought to escape. Trust in personal relationships drives business success but translates poorly to trust in technological systems. Digital trust barriers prevent AI adoption even when potential benefits exist. Scepticism stems from limited positive experiences with AI, concerns about reliability and control, and accurate assessment that current AI cannot replicate core tacit knowledge capabilities.

Practitioners must recognize that growth requires deliberately building organizational capabilities that feel contradictory to entrepreneurial identity. Theory must acknowledge that knowledge management in micro-enterprises cannot simply scale down large organization approaches but requires fundamentally different models that respect professional autonomy while enabling systematization. The path forward, suggested by both literature and these findings, involves staged progression rather than comprehensive transformation. Nambisan et al. (2019) emphasized incremental digital maturity development, and the present study supports this approach. Small veterinary clinics should focus first

on reducing administrative burden through better integration of existing systems, then gradually documenting critical processes, before attempting AI implementation. Leadership attention should prioritize creating cultures that value knowledge sharing while preserving the autonomy that defines professional practice.

Importantly, digital transformation in this context means augmenting rather than replacing human expertise. The veterinarians interviewed possessed exactly the tacit knowledge that AI cannot replicate, and they understood this intuitively. Successful technology adoption will frame AI as a tool that reduces administrative burden and surfaces relevant information, enabling practitioners to focus on the clinical judgment and relationship building that constitutes their core value proposition. This framing aligns technology rather than against professional identity, potentially reducing resistance while building the foundation necessary for deeper digital transformation.

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Appendices

Appendix 1 Interview outline

Interview outline: Knowledge management and everyday challenges in clinics

1. Background information and the everyday life of a veterinarian

1. Could you tell me about your role at the clinic and what your typical workday entails?
2. How long have you worked in the industry and in your current position?
3. What types of areas and entities does a veterinarian's work consist of?
4. What kind of information is associated with each area?
5. Who might this information be shared with?

2. Current knowledge management & information flow

1. How does information currently flow between different professional groups or teams in the clinic?
2. What systems or tools do you use?
3. What is your experience with the functionality of these systems in everyday work?
4. What works particularly well in information management and why?
5. How else is information managed?

3. The biggest challenges

1. If you think about the past week or month, what situations have been the most frustrating from a knowledge management perspective?
2. If you think about the quality of customer service and patient care, what is the biggest area for improvement at the moment?
3. What consequences do these challenges have for your work or the entire clinic's operations?

4. Time management and administrative work

1. What kinds of tasks take time away from patient care or customer encounters?
2. How many hours per week do you spend on administrative tasks (appointments, invoicing, reporting, processing forms)?
3. How much time is spent on customer communication per week (email, phone, reminders)?
4. How often do you have to do manual work with appointments, cancellations, or forms?

5. Development hopes and opportunities for knowledge management

1. What kinds of things would you like to see improved in current knowledge management?
2. If you were given free rein to change one thing in your everyday life, what would it be?
3. What kinds of things do you consider important when implementing new tools or systems?

6. Future and AI technology

1. What ideas do you have about how technology or artificial intelligence could make your work easier?
2. In what areas would you see technology bringing the most benefit – and where do you feel that human expertise is essential?
3. What concerns or doubts do you have about implementing new AI solutions?

7. Final questions

1. Is there anything we haven't covered yet that you feel is important to bring up?