



ISSN: 2288-7709

JEMM website: <https://accesson.kr/jemm>doi: <http://doi.org/10.20482/jemm.2026.14.1.55>

Caregivers as Consumers in Welfare Technology Industrialization

Young Hee RO¹

Received: January 05, 2026. Revised: January 15, 2026. Accepted: January 31, 2026.

Abstract

Purpose: Rapid population aging has intensified structural pressures on caregiving systems, resulting in workforce shortages, high turnover, and persistent caregiver burnout. Although welfare technologies such as care robots, wearable devices, and digital care platforms are widely promoted as solutions, many fail to achieve sustained adoption or industrialization. This study aims to explain why welfare technologies repeatedly remain confined to pilot implementation despite technical viability. Drawing on consumer behavior theory, service-dominant logic, emotional labor theory, and well-being economics, this paper reframes caregivers as consumers and primary value evaluators of welfare technology. It argues that caregivers' emotional and eudaimonic value expectations are often implicit in everyday care practices and therefore remain unarticulated within prevailing technology design, procurement, and evaluation frameworks. When these implicit needs are excluded, welfare technologies may deliver functional improvements while generating compliance without long-term engagement. The study proposes a caregiver-centered conceptual framework that links needs articulation, perceived value in use, and welfare technology industrialization. Illustrative cases are employed to contextualize the framework and to demonstrate the persistence of unmet emotional and eudaimonic needs across different care settings and stages of technology exposure. The analysis highlights how mis-specifying caregivers as passive intermediaries rather than consumers leads to recurring adoption failure. **Conclusions:** The findings suggest that recognizing caregivers as consumers and systematically integrating their value perceptions into design and policy processes is a necessary condition for sustainable welfare technology markets beyond function-oriented innovation.

Keywords : Welfare technology, Caregivers as consumers, Unarticulated needs, Emotional labor, Eudaimonic well-being

JEL Classification Code: I31, I38, O33, M31

1. Introduction

Rapid population aging has become a structural condition shaping contemporary welfare and care systems across advanced economies. Declining fertility rates, extended life expectancy, and increasing care dependency have generated persistent shortages

in caregiving labor, high turnover rates, and widespread caregiver burnout. These challenges are no longer temporary disruptions but enduring features of aging societies, raising fundamental questions about the sustainability of existing care delivery models.

In response, welfare technologies—including care robots, wearable monitoring devices, and digital care

¹ First Author. Assistant Professor. Institute of Future Welfare Convergence. Kangnam University, S. Korea.
Email: ceodro@gmail.com

© Copyright: The Author(s)
This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

platforms—have been widely promoted as strategic solutions to mitigate labor shortages and improve efficiency in care provision. Governments and service providers have invested substantial public resources in pilot programs and demonstration projects, particularly in institutional and community-based care settings. Despite these efforts, however, many welfare technologies fail to achieve sustained adoption or progress beyond limited-scale implementation. Instead, they often remain confined to pilot stages, are underutilized in practice, or are discontinued after initial deployment phases.

Prevailing explanations for this gap between technological promise and real-world outcomes have largely emphasized technological immaturity, high costs, regulatory barriers, or organizational resistance to change. While such factors are undeniably relevant, they do not sufficiently explain why welfare technologies that are technically viable and institutionally supported repeatedly fail to become embedded in everyday care practices. Empirical and policy-oriented studies in health and care technology have shown that adoption failure often occurs even when technical functionality is adequate and formal implementation requirements are met.

This study advances a different explanation. It argues that welfare technology industrialization has been constrained by a structural mis-specification of caregivers within technology design, evaluation, and deployment processes. Although caregivers are the primary users who integrate welfare technologies into emotionally demanding and time-constrained work environments, they are rarely conceptualized as consumers or primary value evaluators. Instead, caregivers are commonly positioned as passive intermediaries expected to comply with technological adoption as long as functional efficiency or task performance improves.

Reframing caregivers as consumers shifts analytical attention from technical performance alone to perceived value in use. From a consumer behavior and service management perspective, adoption and sustained use depend not only on objective functionality but also on whether technologies support users' emotional stability, professional identity, social recognition, and sense of meaning at work. Many of these value expectations are implicit in caregivers' everyday practices and emotional experiences and

therefore remain unarticulated within prevailing technology design, procurement, and evaluation frameworks. When such implicit needs are excluded, welfare technologies may achieve functional compliance without generating long-term engagement or commitment.

The purpose of this paper is to develop a caregiver-centered conceptual framework that explains welfare technology adoption and industrialization through the lens of caregivers as consumers. Drawing on insights from consumer behavior theory, service-dominant logic, emotional labor theory, and well-being economics, the study conceptualizes caregivers' unarticulated emotional and eudaimonic needs as core determinants of adoption rather than as secondary or residual outcomes. By doing so, the paper offers a theoretical explanation for recurrent adoption failure that goes beyond function-oriented accounts of welfare technology development.

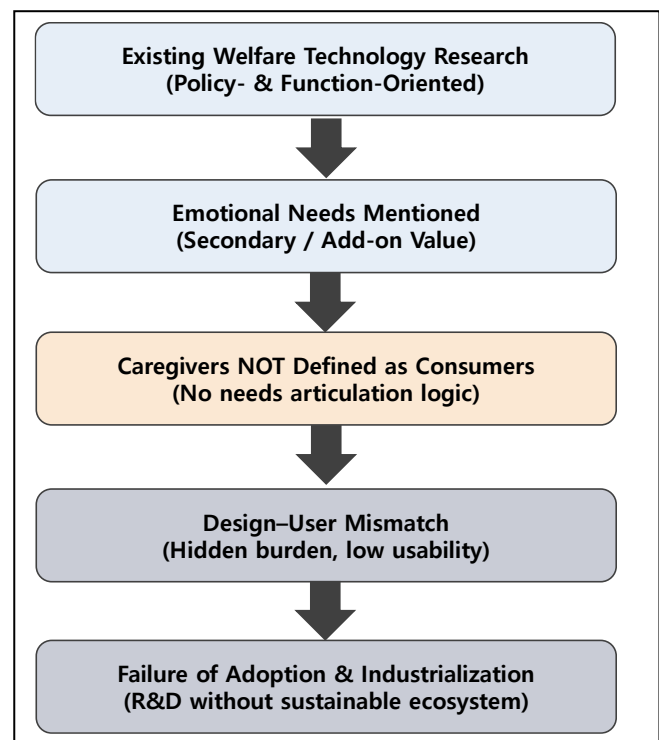


Figure 1: Research Gap in Welfare Technology Development.

Figure 1 illustrates the structural gap addressed by this study. While existing welfare technology research increasingly acknowledges emotional dimensions of care work, caregivers are rarely positioned as

consumers whose value perceptions shape adoption, evaluation, and sustainability. This conceptual gap motivates the present study and provides the foundation for the literature review and caregiver-centered framework developed in the following sections.

2. Literature Review

2.1. Caregiver Burnout, Emotional Labor, and Welfare Technology

Caregiving is widely recognized as emotionally intensive work characterized by sustained interpersonal interaction, moral responsibility, and continuous exposure to stress. A substantial body of research conceptualizes caregiver burnout as a multidimensional phenomenon encompassing emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. These dimensions reflect not only individual psychological strain but also structural conditions that shape caregivers’ quality of working life, work engagement, and long-term retention within care systems.

Importantly, caregiver burnout cannot be sufficiently explained by workload volume or physical task demands alone. The job demands–resources (JD–R) framework demonstrates that burnout emerges when emotional, social, and organizational resources fail to offset persistent job demands. In caregiving contexts, resources such as professional autonomy, social recognition, and perceived meaning at work play a critical role in sustaining emotional resilience and engagement. When these resources are insufficient, caregivers experience chronic strain even in environments where welfare technologies are formally introduced.

Research on emotional labor further deepens this understanding by conceptualizing caregiving as work that requires continuous regulation of emotions to meet professional norms, relational expectations, and institutional demands. From this perspective, burnout reflects the cumulative cost of emotional regulation rather than a simple response to physical or cognitive overload. Welfare technologies that emphasize monitoring, documentation, or task efficiency without adequate consideration of emotional labor may

unintentionally intensify emotional strain, thereby undermining caregivers’ quality of working life.

Despite these well-established insights, welfare technology research and policy initiatives have predominantly evaluated success through functional performance indicators such as efficiency gains, task automation, or error reduction. While such indicators capture instrumental aspects of care work, they provide limited insight into how technologies affect caregivers’ emotional sustainability, professional identity, and sense of accomplishment. As a result, welfare technologies may appear effective at the system level while failing to improve caregivers’ lived experiences at the practice level.

Table 1: Dimensions of Caregiver Burnout and Implications for Welfare Technology

Burnout Dimension	Key Characteristics	Focus of Welfare Technology Design & Evaluation	Remaining Value Gap
Emotional exhaustion	Chronic emotional depletion due to sustained care demands	Rarely addressed	High
Depersonalization	Emotional distancing and reduced empathy	Ignored	Critical
Reduced personal accomplishment	Loss of professional pride and meaning	Indirectly considered	Critical

Note: This table is synthesized by the author based on Maslach et al. (2001), Schaufeli and Bakker (2004), Schaufeli (2017), and OECD (2020).

Table 1 summarizes the core dimensions of caregiver burnout and illustrates how prevailing welfare technology approaches remain disproportionately focused on articulated functional aspects of care work, while emotional and experiential dimensions receive limited systematic attention. The table highlights the persistent gap between what is technically addressed by welfare technologies and what caregivers experience as most consequential to their quality of working life.

These observations suggest that caregiver burnout should not be understood solely as an outcome to be mitigated through technological intervention. Rather, burnout signals deeper value misalignments embedded in welfare technology design and evaluation processes. When welfare technologies are designed and assessed primarily around articulated functional requirements, they are unlikely to address the conditions most closely

associated with caregivers' emotional labor and quality of working life. Caregivers' value expectations—particularly those related to emotional stability, professional recognition, and meaning at work—are often implicitly embedded in everyday care practices, yet remain insufficiently articulated within prevailing welfare technology frameworks. This insight provides the conceptual foundation for the following section, which examines how articulated and unarticulated needs are structured and addressed in welfare technology research.

2.2. Articulated and Unarticulated Needs in Welfare Technology Research

Research on consumer behavior and service innovation has long emphasized that users' value expectations are not confined to explicitly articulated needs. Articulated needs refer to requirements that users can readily express through surveys, interviews, or formal feedback mechanisms. However, a substantial portion of value-related expectations remains embedded in users' everyday experiences and practices and is therefore not consistently articulated within institutionalized evaluation or decision-making processes.

Early innovation research introduced the concept of unarticulated needs to describe value expectations that users often find difficult to verbalize until they are violated or unmet (Leonard & Rayport, 1997). Subsequent studies in service and organizational contexts suggest that many needs are not entirely unknown to users but remain implicit due to structural, normative, or institutional constraints. In caregiving environments, emotional burden, professional strain, and concerns related to meaning at work are frequently experienced and recognized by caregivers, yet they are rarely expressed explicitly within formal welfare technology assessments, procurement procedures, or policy-driven evaluations.

In this study, implicit needs are defined as value expectations that caregivers experience and recognize in their daily work but do not consistently articulate within formal welfare technology design, evaluation, or implementation processes. These needs are neither absent nor unconscious. Rather, they become unarticulated because prevailing welfare technology frameworks systematically prioritize functional performance, efficiency, and compliance over

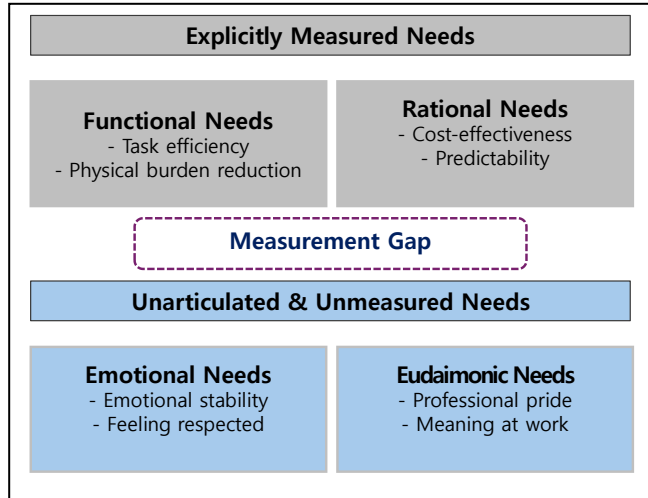
experiential and value-based dimensions. As a result, caregivers' most consequential value expectations remain structurally underrepresented in technology-related decision-making.

Service-dominant logic provides a theoretical foundation for this perspective by conceptualizing value as emerging through use rather than being embedded solely in technological artifacts (Vargo & Lusch, 2008). From this viewpoint, caregivers' implicit needs shape perceived value in use even when such needs are not formally acknowledged or measured. Research on service quality and consumer satisfaction similarly demonstrates that implicit expectations often exert a stronger influence on perceived dissatisfaction and disengagement than explicitly stated requirements (Parasuraman, Zeithaml, & Berry, 1988; Oliver, 1999). These findings suggest that the absence of explicit articulation does not diminish the practical importance of such needs in shaping user evaluation and behavior.

Within welfare technology research, emotional and experiential dimensions of care work are increasingly acknowledged, yet they are frequently treated as secondary or supplementary considerations rather than as core design variables. Technologies are therefore commonly evaluated against articulated functional criteria, while caregivers' implicit emotional and eudaimonic needs—such as emotional stability, professional recognition, and meaning at work—remain marginal to design, evaluation, and procurement processes. This structural imbalance contributes to persistent gaps between perceived importance and satisfaction in caregivers' technology experiences.

Figure 2 conceptually illustrates the structural relationship between articulated and unarticulated needs in welfare technology research. While articulated functional requirements dominate design and evaluation frameworks, implicit emotional and eudaimonic needs remain insufficiently translated into formal criteria. The literature consistently indicates that welfare technologies designed primarily around articulated functional needs are unlikely to achieve sustained adoption when caregivers' implicit value expectations are structurally overlooked. In the absence of mechanisms to recognize and integrate these unarticulated value dimensions, welfare technologies risk producing compliance without

commitment, thereby constraining their potential for long-term use and industrial scalability.



Note: This figure is a conceptual illustration intended to clarify how implicit caregiver needs remain structurally unarticulated within prevailing welfare technology design and evaluation frameworks. It does not represent empirical measurement or causal relationships.

Figure 2: Structural Relationship Between Articulated and Unarticulated Needs in Welfare Technology Research.

2.3. Hedonic and Eudaimonic Needs in Care Work and Welfare Technology

The distinction between hedonic and eudaimonic needs has been widely discussed in the literature on motivation, meaning, and human functioning, particularly within studies of well-being. In the context of care work, this distinction provides a useful lens for understanding why certain value expectations influence short-term satisfaction, while others shape sustained engagement and long-term commitment. Importantly, in this study, hedonic and eudaimonic needs are treated as categories of caregivers’ value expectations rather than as outcome indicators of well-being.

Hedonic needs in care work are primarily related to comfort, convenience, and the reduction of immediate discomfort or strain. In welfare technology contexts, these needs are often addressed through features designed to reduce physical workload, streamline tasks, or improve efficiency. Such needs are typically articulated more easily and are therefore more likely to be incorporated into formal technology design, evaluation, and procurement criteria. Addressing

hedonic needs may lead to short-term satisfaction or relief; however, these effects tend to be limited in their capacity to sustain long-term engagement.

Eudaimonic needs, by contrast, are associated with meaning, purpose, professional identity, and a sense of contribution. In caregiving contexts, these needs are closely tied to caregivers’ emotional labor and occupational identity, including feelings of pride, dignity, social recognition, and meaningful involvement in care relationships. Although caregivers often experience and recognize these needs in their daily work, they are less likely to articulate them explicitly within formal welfare technology assessments. As a result, eudaimonic needs frequently remain implicit and structurally unarticulated in welfare technology design and decision-making processes.

Table 2: Hedonic and Eudaimonic Needs in Care Work and Expected Outcomes

Need Type	Core Focus	Short-Term Outcome	Long-Term Outcome
Hedonic Needs	Comfort, convenience, strain reduction	Satisfaction, temporary relief	Fragile adoption, limited retention
Eudaimonic Needs	Meaning, purpose, professional identity	Engagement, intrinsic motivation	Sustainability, commitment, long-term use

Note: This table is a conceptual synthesis informed by the well-being and motivation literature (e.g., Ryff, 1989; Ryan & Deci, 2001; Waterman, 1993) and is intended to illustrate differences in need characteristics rather than to report empirical results.

Table 2 contrasts hedonic and eudaimonic needs in care work and summarizes their distinct implications for caregivers’ engagement and sustainability. While hedonic needs are primarily associated with immediate satisfaction and convenience, eudaimonic needs are more closely linked to intrinsic motivation, resilience, and long-term commitment. The table highlights how welfare technologies that focus predominantly on hedonic needs may alleviate short-term burdens without addressing the deeper value conditions necessary for durable adoption.

From a welfare technology perspective, the systematic privileging of hedonic needs over eudaimonic needs reflects a broader design bias toward what is measurable, functional, and institutionally legible. Eudaimonic needs, which are relational, experiential, and context-dependent, are more difficult to translate into standardized indicators and are

therefore more likely to be excluded from evaluation and procurement frameworks. This imbalance contributes to a persistent gap between caregivers' perceived importance of certain value dimensions and their satisfaction with technology-supported care work.

Taken together, the distinction between hedonic and eudaimonic needs clarifies why welfare technologies often generate compliance without commitment. Technologies that address hedonic needs may be accepted or tolerated, particularly in settings where adoption is mandated. However, without recognizing and integrating eudaimonic needs into design and evaluation processes, welfare technologies are unlikely to foster sustained engagement or long-term use. This perspective reinforces the central argument of this study: that unmet and unarticulated caregiver needs—rather than technical shortcomings alone—constitute a critical barrier to welfare technology industrialization.

2.4. Synthesis: Toward a Caregiver-Centered Needs Perspective

Taken together, the preceding literature reveals a consistent structural limitation in prevailing welfare technology research. While caregiver burnout, emotional labor, and well-being-related concepts are extensively discussed, these insights are rarely integrated into a coherent needs-based framework that explains adoption and sustainability. As a result, welfare technology initiatives tend to address visible operational challenges while leaving deeper value misalignments unresolved.

Section 2.1 demonstrated that caregiver burnout and emotional labor should not be treated merely as outcomes to be reduced through technological intervention, but as signals of unmet needs embedded in care work. Section 2.2 further showed that many of these needs remain implicit in caregivers' everyday practices and consequently unarticulated within formal technology design, evaluation, and procurement processes. Section 2.3 clarified that not all needs exert the same influence on adoption dynamics: while hedonic needs may shape short-term satisfaction and acceptance, eudaimonic needs are more closely associated with sustained engagement, commitment, and long-term use.

Synthesizing these insights, this study argues that welfare technology adoption failure cannot be

adequately explained by technical limitations or organizational resistance alone. Rather, it reflects a systematic misalignment between caregivers' needs and the criteria that govern welfare technology design and evaluation. Technologies that privilege articulated functional and hedonic needs while neglecting unarticulated eudaimonic needs are likely to generate compliance without commitment, thereby limiting their capacity for durable adoption and industrial scalability.

This synthesis highlights the necessity of a caregiver-centered needs perspective in welfare technology research. Such a perspective requires recognizing caregivers not as passive intermediaries, but as evaluative actors whose needs shape perceived value in use. Importantly, this does not imply unrestricted consumer choice. Instead, caregivers operate as value evaluators within constrained institutional environments, where needs articulation is shaped by organizational norms, professional hierarchies, and policy frameworks.

The following section builds on this synthesized perspective to propose a conceptual framework that explicitly positions caregivers as consumers and primary value evaluators of welfare technology. By linking needs articulation, perceived value, and adoption dynamics, the framework provides a structured explanation for why welfare technologies frequently remain confined to pilot implementation and how caregiver-centered design principles can support sustainable industrialization.

3. Caregivers as Consumers: A Conceptual Framework for Welfare Technology Industrialization

3.1. Reframing Caregivers as Consumers

Existing welfare technology research has largely positioned caregivers as intermediaries who implement technologies on behalf of organizations, policymakers, or care recipients. Within this dominant framing, caregivers are expected to adopt welfare technologies as long as functional efficiency or task performance improves. Such an assumption implicitly treats caregivers as compliant users rather than as evaluative actors whose perceptions of value shape

technology adoption, continued use, and market sustainability.

This study advances an alternative conceptualization by reframing caregivers as consumers within the process of welfare technology industrialization. In consumer behavior and service research, consumers are understood as active value evaluators who assess offerings based on lived experience, expectations, and perceived benefits rather than on objective performance alone. Applying this logic to welfare technology implies that caregivers' subjective evaluations—rather than provider-defined functionality—constitute a primary determinant of adoption and sustainability.

From a service-dominant logic perspective, value is not embedded in technological artifacts but emerges through use in specific social and organizational contexts. Caregivers' daily work environments, emotional demands, and professional identities therefore become central sites of value creation. When caregivers are excluded from consumer status, welfare technologies are designed and evaluated without systematic consideration of how value is actually realized in practice. This misalignment helps explain why technologies that appear functionally effective often fail to achieve durable adoption or industrialization.

Importantly, conceptualizing caregivers as consumers does not imply unrestricted choice or purchasing autonomy. Rather, caregivers operate as value evaluators within constrained institutional environments, where technology use is often mandated, mediated by organizational hierarchies, or embedded in public procurement systems. Even under such constraints, caregivers continuously evaluate welfare technologies based on perceived value in use, shaping their level of engagement, compliance, and long-term commitment.

3.2. Unarticulated Emotional and Eudaimonic Needs as Core Design Variables

A central premise of the proposed framework is that caregivers' emotional and eudaimonic needs should be treated as core design variables rather than as supplementary or secondary outcomes. As reviewed in Section 2, unarticulated needs refer to value expectations related to identity, dignity, and meaning at work that are experienced in practice but remain

insufficiently translated into formal design and evaluation criteria.

Welfare technology development has tended to prioritize articulated functional needs because they are easier to specify, measure, and convert into technical requirements (Norman, 2013; Verganti, 2009; Ro & Kil, 2022). However, privileging measurability over experiential significance leads to the systematic exclusion of what caregivers value most. Within the proposed framework, emotional and eudaimonic needs are positioned upstream in the design process, shaping not only interface features but also service logic, incentive structures, and evaluation criteria.

Crucially, emotional and eudaimonic needs are not reducible to short-term satisfaction. While functional improvements may reduce workload or improve efficiency, they do not automatically enhance caregivers' sense of meaning, professional identity, or emotional stability. When these deeper needs remain unarticulated, welfare technologies may be tolerated or superficially adopted without generating sustained engagement. The framework therefore conceptualizes needs articulation as a prerequisite for meaningful adoption rather than as a post hoc evaluation exercise.

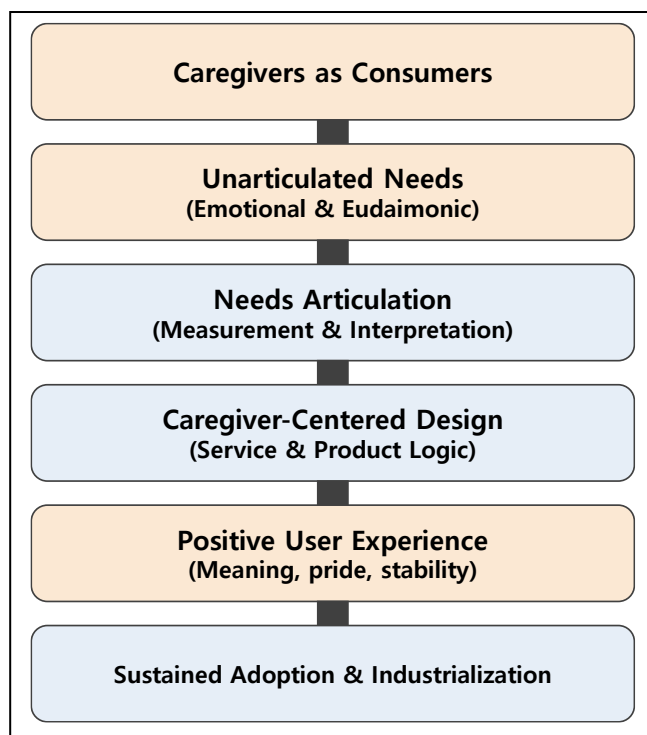
3.3. Needs Articulation and the Mechanism of Adoption Failure

The caregivers-as-consumers framework clarifies the mechanism through which neglecting unarticulated needs leads to repeated adoption and industrialization failure. When caregivers are not defined as consumers, their emotional and eudaimonic needs remain largely invisible within design, procurement, and evaluation processes. As a result, welfare technologies are selected and assessed primarily on functional or economic indicators that do not capture experiential value.

From a consumer behavior perspective, adoption and continued use depend on perceived value rather than on objective performance alone. Even technically robust technologies may fail to generate commitment if caregivers perceive them as emotionally burdensome, professionally alienating, or misaligned with their sense of purpose. In such cases, caregivers may comply with mandated use while minimizing actual engagement or abandoning the technology once external pressure diminishes.

This mechanism is reinforced at the institutional level. Because unarticulated needs are difficult to quantify, they are rarely incorporated into cost–benefit analyses, procurement criteria, or performance metrics. Organizational and policy decisions therefore systematically privilege what is measurable over what is meaningful, creating a self-reinforcing cycle in which welfare technologies are repeatedly developed, demonstrated, and discontinued without achieving industrial scalability.

3.4. The Caregivers-as-Consumers Framework



Note: Accordingly, the cases do not aim to validate the framework empirically, but solely to illustrate how caregivers' value perceptions manifest across different contexts.

Figure 3: Caregivers as Consumers: A Needs-Based Framework for Welfare Technology Industrialization

Figure 3 illustrates the caregivers-as-consumers framework proposed in this study, which links caregivers' conceptualization as consumers to needs articulation, perceived value in use, and welfare technology industrialization. The framework begins by positioning caregivers as constrained value evaluators embedded in institutional care environments. Within

this context, caregivers' needs are differentiated along two dimensions: articulated versus unarticulated, and hedonic versus eudaimonic.

Articulated functional and hedonic needs are more likely to be incorporated into welfare technology design and evaluation criteria because they are measurable and institutionally legible. In contrast, implicit emotional and eudaimonic needs—such as professional pride, recognition, and meaning at work—remain structurally unarticulated. Through structured needs articulation processes involving measurement, interpretation, and translation, these unarticulated needs can be converted into caregiver-centered service and product logic.

When caregiver-centered design reflects articulated emotional and eudaimonic needs, technologies are more likely to generate value-in-use experiences, characterized by meaning, professional affirmation, and emotional stability. Over time, such experiences support sustained adoption, deeper engagement, and the stabilization of usage practices. At the system level, these dynamics enable welfare technologies to move beyond pilot implementation toward industrialization characterized by scalability, market formation, and ecosystem sustainability.

Institutional extensions of service-dominant logic further suggest that value creation is shaped by organizational routines, policy frameworks, and social recognition systems. Within welfare technology contexts, these institutional conditions can either reinforce or undermine caregiver-centered value creation, highlighting the importance of aligning design, incentives, and policy structures with caregivers' roles as value evaluators.

3.5. Theoretical Contributions of the Framework

The proposed framework contributes to the welfare technology and service management literature in several important ways. First, it integrates insights from caregiver burnout, emotional labor, and needs-based theory into a unified explanation of welfare technology adoption and industrialization. Rather than attributing failure to isolated technical or organizational factors, the framework demonstrates how the systematic neglect of caregivers' unarticulated needs produces recurring adoption challenges.

Second, the framework extends service-dominant logic by explicitly identifying caregivers as consumers

and primary value evaluators within welfare technology ecosystems. While service-dominant logic emphasizes value co-creation through use, its application to caregiving contexts has remained limited. By situating value creation within caregivers' everyday practices, the framework clarifies where and how welfare technology value is realized—or fails to be realized.

Third, the framework offers a theoretical explanation for the persistent gap between pilot success and large-scale industrialization. Existing accounts often emphasize cost, regulation, or resistance to change. The caregivers-as-consumers framework instead highlights a market and design failure rooted in mis-specified users and unarticulated value. By repositioning emotional and eudaimonic needs as core design variables, the framework provides a foundation for future empirical research and policy innovation aimed at building sustainable welfare technology markets.

4. Illustrative Cases: Contextualizing the Caregivers-as-Consumers Framework

This section presents two illustrative cases to contextualize the caregivers-as-consumers framework proposed in Section 3. The purpose of these cases is not to test hypotheses or establish causal relationships, but to demonstrate how unarticulated caregiver needs manifest across different care settings and stages of welfare technology exposure. Consistent with the conceptual nature of this study, the cases are used as descriptive and interpretive supports that help bridge abstract framework elements and real-world caregiving contexts.

The two cases represent distinct points along the adoption trajectory. The first case examines institutional caregivers prior to formal welfare technology demonstration, capturing baseline value expectations and latent needs before technology exposure. The second case focuses on home-care workers with post-adoption experience of wearable-based monitoring systems, highlighting the persistence of unmet needs despite prolonged use. Together, the cases illustrate that caregivers function as value evaluators both before and after adoption, and that unarticulated emotional and eudaimonic needs remain salient across contexts.

4.1. Purpose and Scope of the Illustrative Cases

The illustrative cases serve three specific purposes. First, they provide contextual support for the caregivers-as-consumers framework by showing how caregivers evaluate welfare technologies through value criteria that extend beyond functional performance. Second, they demonstrate that unmet emotional and eudaimonic needs are not confined to early adoption stages but persist even after technologies are integrated into daily routines. Third, they help clarify why welfare technologies may achieve compliance without commitment, a pattern emphasized in the conceptual framework.

It is important to note that the cases are not intended as representative samples or as evidence for generalization. Rather, they are exploratory and descriptive in nature, drawing on survey-based and observational materials collected during pilot and demonstration phases of welfare technology initiatives. Accordingly, quantitative results are not interpreted inferentially, and no causal claims are derived from the data presented.

Table 3: Overview of the Illustrative Cases and Their Analytical Roles

Care Context	Sample Size	Technology Exposure Stage	Analytical Role
Institutional care	N=51	Pre-demonstration	Baseline needs mapping
Home care	N=12	Post-adoption	Persistence of unmet needs

Note: The cases are illustrative and descriptive in nature. They are used to contextualize the proposed framework rather than to support inferential or comparative analysis.

Table 3 summarizes the basic characteristics of the two illustrative cases, including care context, stage of technology exposure, and analytical role within the study.

4.2. Illustrative Case 1: Pre-Adoption Context—Institutional Caregivers and Unarticulated Value Expectations

The first illustrative case examines institutional caregivers prior to formal demonstration or deployment of welfare technology. At this stage, caregivers had limited or no direct experience with specific technological systems, allowing their responses to reflect baseline value expectations rather than reactions to particular design features. This pre-

adoption context provides insight into the needs that caregivers consider important before encountering welfare technology in practice.

In this case, caregivers evaluated various aspects of their work environment, including functional conditions, emotional demands, and meaning-related dimensions. While functional needs such as workload management and task efficiency were recognized, caregivers consistently expressed strong value expectations related to emotional stability, professional recognition, and dignity at work. These expectations were often articulated indirectly, through descriptions of stress, pride, or perceived lack of acknowledgment, rather than as explicit technology requirements.

From the caregivers-as-consumers perspective, these patterns indicate that caregivers entered the adoption process with implicit value criteria that shaped their openness to welfare technology. When technologies are introduced without acknowledging these criteria, caregivers may comply with participation in demonstrations while remaining skeptical about the technology's relevance to their lived experience. This case thus illustrates how unarticulated emotional and eudaimonic needs function as latent evaluative standards prior to adoption.

4.3. Illustrative Case 2: Post-Adoption Context—Home-Care Workers and Persistent Unmet Needs

The second illustrative case focuses on home-care workers with post-adoption experience of wearable-based monitoring systems used in community and home-care settings. Unlike the pre-adoption context of Case 1, caregivers in this case had incorporated welfare technology into their daily routines over an extended period, allowing examination of value perceptions after functional exposure.

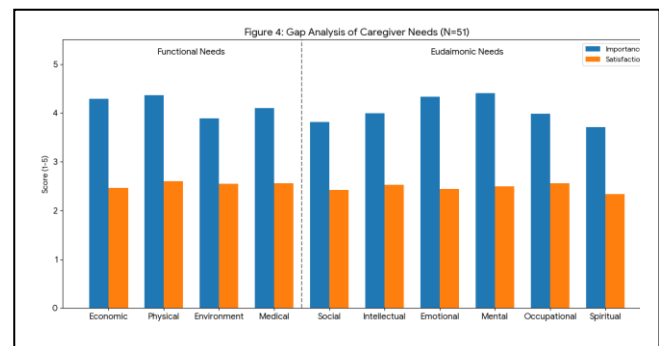
Caregivers in this context acknowledged certain functional benefits associated with technology use, such as improved monitoring, coordination, or documentation. However, these functional improvements did not fully address concerns related to emotional burden, autonomy, and professional recognition. In some instances, caregivers reported increased stress associated with monitoring requirements or perceived surveillance, suggesting

that functional gains were accompanied by new forms of emotional strain.

Despite routine use of the technology, many caregivers continued to experience unmet emotional and eudaimonic needs. From the caregivers-as-consumers perspective, this pattern reflects compliance-oriented adoption: technology use is sustained at a basic level due to institutional requirements, yet deeper engagement and commitment remain limited. This case demonstrates that post-adoption exposure alone does not resolve unarticulated needs when value articulation mechanisms are absent.

4.4. Cross-Case Interpretation: Persistence of Unmet Needs

Taken together, the two illustrative cases reveal a consistent pattern across care contexts and adoption stages. Whether before or after technology introduction, caregivers evaluated welfare technologies through value criteria that extended beyond functional performance. Emotional stability, professional dignity, and meaning at work emerged as salient dimensions of evaluation in both cases.



Note: The figure illustrates relative tendencies across caregiver need domains by contrasting perceived importance and satisfaction.

Figure 4: Illustrative Patterns of Perceived Importance–Satisfaction Differences Across Caregiver Need Domains

Across both cases, functional domains exhibited smaller differences between importance and satisfaction, whereas emotional and eudaimonic domains displayed larger and more persistent differences. This cross-case pattern aligns closely with the caregivers-as-consumers framework proposed in Section 3. When caregivers' unarticulated emotional and eudaimonic needs are not explicitly integrated into design and evaluation processes, welfare technologies

tend to stabilize at a level of compliance without commitment. Adoption is maintained through external requirements, but engagement remains shallow, thereby limiting the potential for long-term use and industrial scalability.

4.5. Implications of the Illustrative Cases for the Conceptual Framework

The illustrative cases reinforce the central argument of this study: welfare technology adoption challenges cannot be fully explained by technical limitations or initial resistance alone. Instead, they reflect a systematic misalignment between caregivers' needs and the criteria used to design, evaluate, and scale welfare technologies.

By demonstrating the persistence of unmet needs across contexts, the cases highlight the importance of needs articulation as an ongoing process rather than a one-time assessment. Integrating caregiver-centered value criteria—particularly emotional and eudaimonic needs—into design, procurement, and policy frameworks is essential for moving welfare technologies beyond pilot implementation toward sustainable industrialization.

5. Conclusions and Implications

This study set out to explain why welfare technologies repeatedly struggle to progress beyond pilot implementation despite technical feasibility and policy support. Drawing on a caregiver-centered needs perspective, the study argued that adoption and industrialization failures cannot be sufficiently explained by technological immaturity, organizational resistance, or regulatory barriers alone. Instead, they reflect a structural misalignment between caregivers' needs and the criteria that govern welfare technology design, evaluation, and scale-up.

By reframing caregivers as consumers and constrained value evaluators, this study highlighted the central role of unarticulated emotional and eudaimonic needs in shaping perceived value in use. The findings suggest that while welfare technologies often address articulated functional and hedonic needs, they systematically overlook deeper value expectations related to professional dignity, recognition, and meaning at work. When such needs remain

unarticulated, welfare technologies may achieve compliance without commitment, resulting in superficial adoption and limited industrial scalability.

5.1. Theoretical Implications

This study makes three primary theoretical contributions. First, it advances welfare technology research by integrating caregiver burnout, emotional labor, and needs-based theory into a unified explanation of adoption dynamics. Rather than treating burnout as an outcome to be mitigated, the study conceptualizes it as a signal of unmet needs embedded in care work, thereby shifting analytical attention from implementation barriers to value misalignment.

Second, the study extends service-dominant logic by explicitly positioning caregivers as consumers and primary value evaluators within welfare technology systems. While prior research has emphasized value co-creation through use, the caregiver-centered perspective clarifies whose evaluations matter most in determining sustained adoption. Importantly, this conceptualization recognizes caregivers as consumers operating under constrained institutional conditions rather than as free market actors.

Third, the study contributes to needs-based theory by distinguishing between articulated, implicit, and structurally unarticulated needs in welfare technology contexts. By demonstrating how implicit emotional and eudaimonic needs become unarticulated through design, evaluation, and procurement processes, the study provides a theoretical mechanism linking unmet needs to recurring adoption failure.

5.2. Policy and Practical Implications

From a policy perspective, the findings underscore the limitations of function-oriented welfare technology strategies. Public procurement and evaluation frameworks that prioritize measurable efficiency indicators—such as cost reduction, accuracy, or throughput—risk reinforcing technologies that are technically functional yet experientially misaligned with caregivers' needs. Incorporating caregiver-centered value criteria, particularly emotional and eudaimonic dimensions, into procurement guidelines and assessment processes may increase the likelihood of sustained adoption and improve the long-term return on public investment.

For technology developers and service providers, the study highlights the importance of upstream needs articulation. Caregiver-centered design should move beyond usability testing and functional requirement gathering to include mechanisms for capturing implicit value expectations, such as participatory design, qualitative sense-making, and iterative feedback processes. Prior research on care robotics suggests that integrating emotional value dimensions is also critical for transitioning welfare technologies toward sustainable and premium service models, rather than remaining confined to cost-driven or demonstration-based deployment (Ro & Kil, 2022).

At the organizational level, care institutions should recognize that technology adoption is not solely a technical decision but a value-sensitive process. Supporting caregivers' roles as value evaluators—through structured feedback channels, reflective practices, and recognition systems—can help align institutional objectives with caregivers' lived experiences. Such alignment may reduce shallow compliance and facilitate deeper engagement, thereby strengthening the conditions necessary for long-term use and industrial scalability.

5.3. Limitations and Future Research Directions

This study has several limitations that point to avenues for future research. First, as a conceptual study supported by illustrative cases, it does not test causal relationships or provide generalizable empirical evidence. Future studies could empirically examine the proposed framework using longitudinal designs or comparative analyses across care settings.

Second, the study focused primarily on caregivers' perspectives and did not explicitly examine interactions with other stakeholders, such as care recipients, managers, or policymakers. Future research could explore how multiple evaluative perspectives interact and potentially conflict within welfare technology ecosystems.

Finally, further methodological work is needed to develop robust tools for articulating and measuring emotional and eudaimonic needs in technology design and evaluation contexts. Advancing such tools would support the operationalization of caregiver-centered value criteria and strengthen evidence-based policy and design decisions.

5.4. Concluding Remarks

This study concludes that sustainable welfare technology industrialization depends not only on what technologies can do, but on how caregivers evaluate their value in use. Recognizing caregivers as consumers and primary value evaluators reframes adoption failure as a market and design problem rather than as a purely technical challenge. By foregrounding unarticulated emotional and eudaimonic needs as core design variables, the caregivers-as-consumers framework provides a foundation for building welfare technology systems that move beyond compliance-oriented deployment toward sustained engagement and industrial scalability.

Acknowledgements

This research was conducted as part of the User-Centered Care Robot and Service Demonstration R&D Project (2023–2027), supported by the Ministry of Health and Welfare of the Republic of Korea and the National Rehabilitation Center. The study is associated with the project entitled “Development and Demonstration of an Integrated Care Robot Control System and Care Data-Based Services” (Project No. HK23C0054), led by RoboCare in collaboration with Kangnam University and participating institutions.

The author gratefully acknowledges the caregivers and practitioners who participated in the preliminary surveys and shared valuable insights based on their experiences in real-world care settings.

This manuscript was proofread by a native English speaker to ensure clarity, grammatical accuracy, and academic tone.

References

- Bakker, A. B., & Demerouti, E. (2007). The job demands–resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Brotheridge, C. M., & Grandey, A. A. (2002). Emotional labor and burnout: Comparing two perspectives of “people work.” *Journal of Vocational Behavior*, 60(1), 17–39. <https://doi.org/10.1006/jvbe.2001.1815>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D.-W., Oishi,

- S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, 97(2), 143–156. <https://doi.org/10.1007/s11205-009-9493-y>
- Greenhalgh, T., Wherton, J., Papoutsis, C., Lynch, J., Hughes, G., A'Court, C., & Shaw, S. (2017). Beyond adoption: A new framework for theorizing and evaluating nonadoption, abandonment, and challenges to the scale-up, spread, and sustainability of health and care technologies. *Journal of Medical Internet Research*, 19(11), e367. <https://doi.org/10.2196/jmir.8775>
- Grönroos, C. (2008). Service logic revisited: Who creates value? And who co-creates? *European Business Review*, 20(4), 298–314. <https://doi.org/10.1108/09555340810886585>
- Hochschild, A. R. (1983). *The managed heart: Commercialization of human feeling*. University of California Press.
- Holbrook, M. B., & Hirschman, E. C. (1982). The experiential aspects of consumption: Consumer fantasies, feelings, and fun. *Journal of Consumer Research*, 9(2), 132–140. <https://doi.org/10.1086/208906>
- Leonard, D. A., & Rayport, J. F. (1997). Spark innovation through empathic design. *Harvard Business Review*, 75(6), 102–113.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397–422. <https://doi.org/10.1146/annurev.psych.52.1.397>
- Norman, D. A. (2013). *The design of everyday things* (Revised ed.). Basic Books.
- OECD. (2020). *Who cares? Attracting and retaining care workers for the elderly*. OECD Publishing. <https://doi.org/10.1787/92c0ef68-en>
- Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing*, 63(Special Issue), 33–44. <https://doi.org/10.1177/00222429990634S105>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12–40.
- Ro, Y.-H., & Kil, H.-M. (2022). Tailoring care robotics through utilitarian and emotional needs: Transitioning to premium paid services in South Korea. *Evolutionary Studies in Imaginative Culture*, 6(2). <https://esiculture.com/index.php/esiculture/article/view/2892>
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069–1081. <https://doi.org/10.1037/0022-3514.57.6.1069>
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141–166. <https://doi.org/10.1146/annurev.psych.52.1.141>
- Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, 4(1), 5–18. <https://doi.org/10.1080/15710880701875068>
- Schaufeli, W. B. (2017). Applying the job demands–resources model: A “how to” guide to measuring and tackling work engagement and burnout. *Organizational Dynamics*, 46(2), 120–132. <https://doi.org/10.1016/j.orgdyn.2017.04.008>
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, 25(3), 293–315. <https://doi.org/10.1002/job.248>
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- Shanafelt, T. D., Dyrbye, L. N., & West, C. P. (2017). Addressing physician burnout: The way forward. *JAMA*, 317(9), 901–902. <https://doi.org/10.1001/jama.2017.0076>
- Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Commission on the Measurement of Economic Performance and Social Progress, Paris.
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>
- Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: An extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5–23. <https://doi.org/10.1007/s11747-015-0456-3>
- Verganti, R. (2009). *Design-driven innovation: Changing the rules of competition by radically innovating what things mean*. Harvard Business Press.
- Waterman, A. S. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personality and Social Psychology*, 64(4), 678–691. <https://doi.org/10.1037/0022-3514.64.4.678>
- World Health Organization. (2016). *Global strategy on human resources for health: Workforce 2030*. World Health Organization.
- Zapf, D. (2002). Emotion work and psychological well-being: A review of the literature and some conceptual considerations. *Human Resource Management Review*, 12(2), 237–268. [https://doi.org/10.1016/S1053-4822\(02\)00048-7](https://doi.org/10.1016/S1053-4822(02)00048-7)