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Target Framework for Sustainable Deployment of Welfare Technology in Eldercare

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TARGET FRAMEWORK FOR SUSTAINABLE DEPLOYMENT OF WELFARE TECHNOLOGY IN ELDERCARE

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Abstract

Building on existing research and experiences regarding the use of supportive and assistive technology -- called welfare technology -- in elderly care, we have developed a framework to represent a holistic view of the complex tangle of factors contributing to the sustainable integration of these technologies into the elder care context. The framework is described here for the purpose of initiating a conversation regarding the framework with interested researchers. We will also conduct discussions with managers, caregivers, and other stakeholders involved in welfare technology deployment in eldercare in Sweden to obtain their feedback on the framework. Our ultimate goal with the framework is to provide general guidelines that municipalities and care organizations can use to improve the quality of life for elderly citizens through the successful selection, rollout and use of welfare technology that meets the needs not only of the elderly citizens needing support but also of the care providers and organizations.

Keywords: welfare technology, assistive technology, elder care, technology deployment, senior services

1.0 Introduction

The recent pandemic has accelerated pressures on healthcare systems around the world. A particular area of concern is eldercare, due to both the growth in this sector of the population as well as the greater healthcare needs of older citizens. Through its Vision for eHealth 2025 initiative, Sweden has proposed to use healthcare technology to become a world leader in the equitable provision of health and social services. (Wickström et al., 2017). The term *welfare technology* is used to refer to technology that supports "safety, activity, participation and independence for any person who has or is at increased risk of developing a disability" (Brynn, 2016, p. 335). Our focus in this paper is welfare technology that could be used in care homes (also called institutional care or nursing homes) for the elderly. This covers a broad range of

possible technologies, from wearable devices to monitor a particular health condition of an individual to the use of smart beds throughout a care home to a regional administrative system that supports scheduling of therapy sessions for care home residents.

The uptake of welfare technologies in Sweden and elsewhere has been much slower than expected, and the expected benefits have not been fully realized (Murray et al., 2011; Frennert 2018). While a thorough exploration of the breadth of issues contributing to this is outside the scope of this short paper, it should be stressed that this is a complex issue and barriers occur across many dimensions including the political (e.g legislative, policy making), economical (various resources in time, money, assets), social (relational, demographic, socio-economic), technological (knowledge, availability), labor (recruitment, competencies, work environment) and individual (interest, desires, needs, abilities, sensibilities) and their interactions (Haslwanter and Fitzpatrick, 2017; Yusif et al., 2016). Welfare technologies are "interconnected systems of technical, social and human elements that together create value." (Bygstad and Lanestedt, 2017, p. 290). Through the literature and our own research we have identified a number of issues that are relevant for creating a context in which welfare technologies can be not only successfully deployed but also successfully used over time, thus *sustainable*. In this paper we will present a framework that visually communicates these concepts with the purpose of inviting feedback that can be used to refine the framework prior to moving into the evaluation phase.

2.0 The Target Framework

The aim of the framework (Figure 1) is to identify those conditions that should exist to support the integration of welfare technology that contributes to improved quality of life for the citizens for whose care the technology is used, while also supporting (rather than hindering) the care providers and meeting the goals of the organizations with the responsibility for providing the care. The framework has at its center "success". For our purposes, success means that the triple goal of meeting the needs of patients, the caregivers, and the healthcare system has been met and sustainable use has been achieved wherein the particular welfare technology will continue to be used as long as

it is providing benefits to the stakeholders. If this can be achieved, not only will quality of life be improved for residents of care homes and the staff, but resources will be used more efficiently because wasteful spending on technology that is not used will be avoided and time will not be spent implementing technology that no resident wants or needs. To reach this state of sustainable use (success) there must be trust and a shared understanding of multiple needs. This is achieved by ensuring that the decision-making process is inclusive so that the stakeholders together can identify meaningful areas where the support of welfare technology could contribute and would fit the context when viewed from all relevant perspectives. Ensuring that foundational capabilities are in place facilitates successful deployment. Following any implementation of technology, adaptations in the manner in which the technology is used and the discovery of new uses are to be expected. All components of the framework are discussed in the following sections.

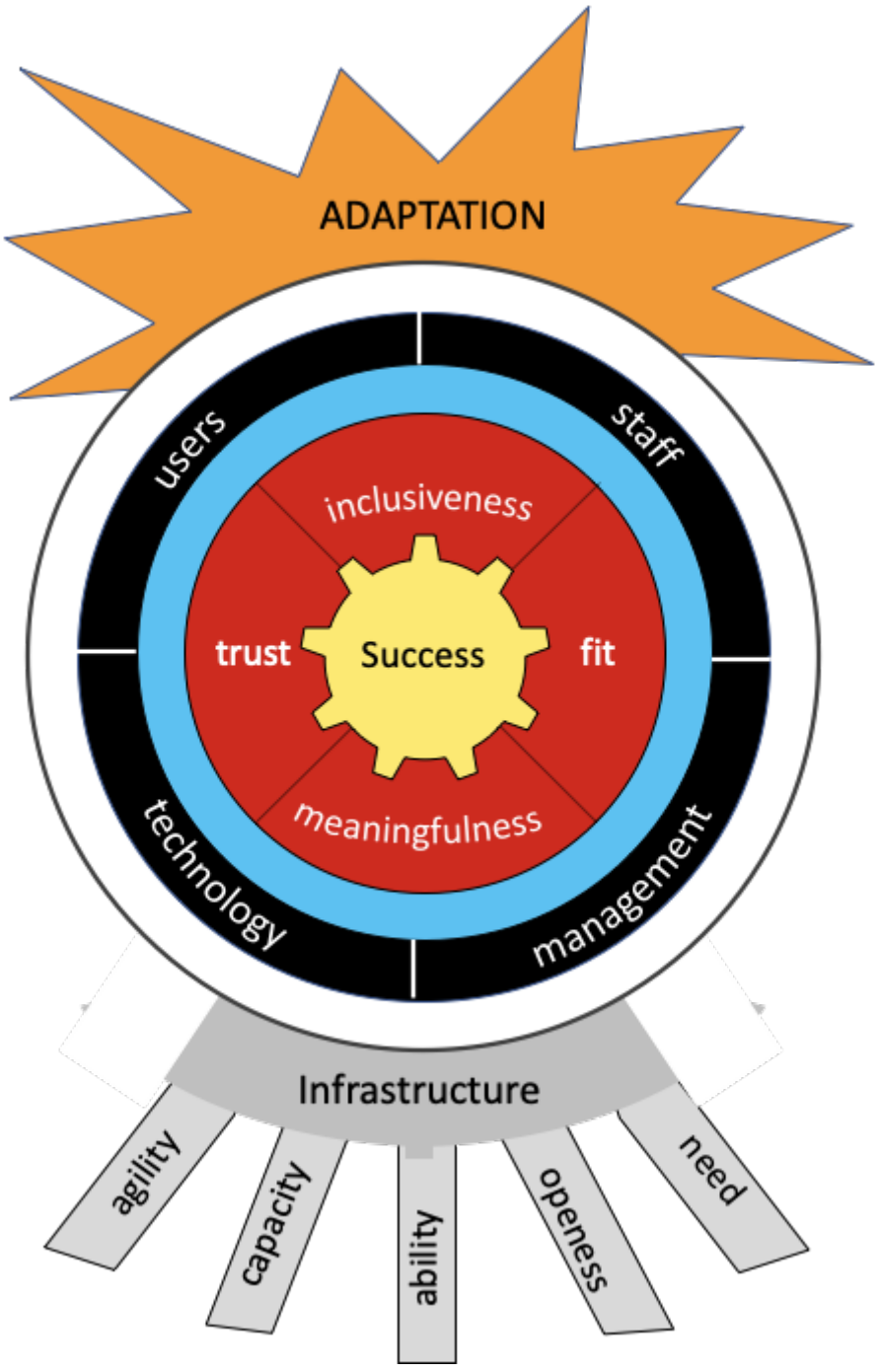

Figure 1. Target framework for sustainable deployment of welfare technology.

2.1 Foundations

Underlying the circular 'target' portion of the framework are the conditions that should be in place to support the successful, sustainable deployment of welfare technology. This socio-technical foundation includes not only the appropriate technology infrastructure (which could be access to a reliable Wi-Fi network or a complex multi-

tier architecture integrating several different platforms) and the personnel to manage it, but also characteristics of the stakeholders, both organizationally and individually, and the driving force for this process, which is the need for the particular technology.

Welfare technology cannot be expected to be successfully adopted if it is not meeting a recognized need. Unfortunately it is often the decision-makers' perception of need that drives technology acquisitions (top-down) rather than those working closer to the residents or the residents themselves. A lack of need for the technology has been identified as one of the primary barriers to successful introduction of assistive technology (Yusif et al., 2016). Co-creation and involvement by the end users (care home residents) in the entire process of selecting and deploying welfare technology can increase the likelihood of a successful outcome. While the needs of the care home residents should be prioritized, the needs of care providers are also relevant. Caregivers can identify technology that could help them provide care for their patients or make their own work more efficient. It is important for caregivers to feel that their opinions matter and that they have an impact on decisions made at the facility (Jönsson et al., 2019). Top-down initiatives, driven by cost-cutting or data collection expectations are much less likely to result in successful deployment of welfare technology.

The stakeholders' openness to new tools and processes, and their ability to learn and use new technology, are essential to successful deployments. For individuals, and possibly organizations as well, these two concepts are closely related. Openness is related to motivation to learn new things as well as to cognitive ability (Jackson et al., 2020). To meet the challenges in eldercare, stakeholders at all levels must be willing to learn about new technologies and new applications of familiar technologies that can provide support to residents of care homes and the staff who care for them. Unfortunately, caregivers have reported having little or no opportunity to explore the use of welfare technologies (Baudin et al., 2020). Eldercare organizations at the local, municipal, regional or state level can promote this openness through communication and opportunities to share knowledge, and can increase the technical literacy and competency of all stakeholders through provision or support for educational activities.

A common complaint of the caregivers expected to deploy welfare technologies is that learning how to use the technology and guiding their residents in its use must be done

on top of their existing responsibilities (Nilsen et al. 2016). It is therefore important that the organization have the capacity to adjust work schedules and task performance to allow sufficient time for on-going training and self-learning, and to allow extra time for introducing the new technology. It may be that extra staff is needed during the initial deployment. If care staff feel overworked and underappreciated, they are not likely to be able to find the mental and emotional capacity to engage with a new technology.

Agile organizations have the ability to quickly change work practices to integrate new technologies and new processes (Lu and Ramamurthy, 2011). This type of flexibility enables changes to be quickly implemented, through adjustments to staff allocations, job descriptions, and expectations. It is not just flexibility in terms of personnel resource allocation (related to capacity) that is important. Other aspects of agility are related to the framework's foundational elements such as the openness to innovation (climate) and ability (competences), and these can be supported through communication and demonstrated commitment of organizational leaders (Liang et al., 2018).

2.2 The "meeting" of technology and stakeholders

The implementation of welfare technology requires cooperation and coordination across different levels and groups of stakeholders. Every particular context in which welfare technology is deployed (or considered for deployment) involves the coming together of various stakeholder groups and the technology itself, situated within a particular environment. The goal of this process is to bring the diverse perspectives together to jointly identify technology that fits the identified needs and context. The primary stakeholder groups are the residents of the care homes (the ultimate end users of the technology or the recipients of the benefits), the staff of the care home (nurses, social workers, therapists, physicians, and other caregivers), and the group called 'management' which may include not only management of individual care homes, but also those who oversee or regulate care homes at a municipal, regional, or broader level. In general, managers determine what care services will be available and who is eligible to receive them and monitor and evaluate the outcomes (Frennert, 2020). It should be noted that stakeholder groups are not homogeneous groups. Care home residents can have vastly different health situations, abilities and needs for assistance. Staff differ in their education and experiences, as well as their job responsibilities and need for or interest in technology support (Baudin et al., 2020). Managers may have different areas

of responsibility and may be too far away from the actual delivery of care to understand what is actually needed on the ground, so it is important that they make decisions in conjunction with caregivers and residents. All stakeholder groups can be expected to have broad diversity in terms of technology knowledge and expertise. A successful "meeting" requires, however, both that the decision process is inclusive enough to cover this diversity and that the participants can overcome their differences and establish trust both within the organization and in relation to technology itself (Steinke et al, 2014). This trust includes a belief that all stakeholders are working toward consistent goals, and that they all view the deployment of welfare technologies to be a meaningful activity, providing not only improved quality of life for the residents of the care home, but also providing a better work environment either through simplification of work tasks or greater satisfaction due to meeting patients' needs. While management may be concerned with resource management, both financial and personnel, ideally their decisions will be guided by improving care for patients and supporting the staff. "A way forward is to view the deployment of welfare technology as an iterative process aiming at increasing human welfare and providing equal access and just distribution of care through and by technology while also respecting privacy, dignity, and vulnerability of the patients and care personnel." (Frennert, 2020)

2.3 Adaptation

Adaptations or changes that may be necessary for a successful integration of a technological innovation include adjustments to the foundational issues supporting the implementation. Changes to the technology itself (customization or personalization, for example), changes to the infrastructure to support the technology (such as improved bandwidth of a Wi-Fi network), or changes to the people themselves, in terms of changing levels of knowledge, changing attitudes, or changing practices, may be needed. In addition, there may be a need for changes in policies at the organizational, local, regional, or state level. Policies may be related to training, or selection of technologies, or whether the organization encourages diversity of experiences in the staff or encourages cross-training opportunities and knowledge sharing. As the deployment is scaled, the diversity of stakeholders and environments, as well as changing needs and the interactions of social and technological elements will create new and different uses for the technology (Bygstad and Lanestedt, 2017). For example, a care home installed cameras with the intended purpose of remotely monitoring

wandering residents overnight. However, once the system was in use it was found that the cameras were useful to quickly and quietly locate staff members who were assisting residents in their rooms. This was an unexpected use of the technology, but one that was found to be valuable in the context. This expansion of use should, in our opinion, be expected and supported.

3.0 Discussion and Conclusion

The target framework presented here is not intended to be used in a formulaic way as a step-by-step process for implementation of welfare technologies. Instead, it is intended to be used in a reflective manner, to understand, describe and analyse the context, and to help organizations prepare by looking for areas where more development is needed, such as in the technology foundation, or the need for a culture shift in order to open up the organizations and individuals to the possibility of change, or the need for training to enable individuals to trust that they will be able to use the technology. We intend for the framework to highlight the importance of recognizing the co-related and possibly competing needs of all the stakeholders involved and that sustainable use cannot be achieved without reconciling these.

The framework as presented is in process, and may change as we engage in discussions with researchers and practitioners, and as we seek to evaluate its usefulness. Admittedly the framework is at a high, general level, and not customized for specific types of patients, specific health issues, or particular technologies. Studies focusing on specific use cases can contribute to our understanding of how well this framework works in various contexts. The framework provides only general guidance. Perhaps in time more detailed readiness evaluation criteria can be provided, such as Yusif et al.'s (2020) questionnaire that measures factors related to an organization's ability to successfully use healthcare technology such as technology readiness, operational resources, organization and culture, and regulatory and policy readiness.

Our next steps include interviews with Swedish municipal care home managers and staff and ultimately residents to determine how well the framework represents their experiences with the successful (and not successful) implementation of welfare technology, and to identify important elements that should be added to the framework.

Once we are confident that the framework is comprehensive, we would like to introduce it more broadly to healthcare decision-makers and care home staff and managers and follow welfare technology deployments that are informed by the framework to determine whether it has a positive impact on outcomes.

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