

Chapter 4

Telehealth Development, Implementation, and Sustainability Challenges: An Introduction into the Telehealth Service Implementation Model (TSIM™)



Shawn R. Valenta, Meghan Glanville, and Emily Sederstrom

Introduction

According to Liezl van Dyk in “A Review of Telehealth Service Implementation Frameworks,” there are many complex factors (see Table 4.1) that can impact the success of developing and implementing telehealth services [1]. In that article, van Dyk describes how the success rate of telehealth services has been disappointing and a holistic implementation approach is needed. In this chapter, we review some of the early frameworks that van Dyk researched and how they apply to current telehealth challenges. In addition, we provide specific examples throughout the lifecycle of a telehealth service that highlights those complex factors that can impact the development and implementation of a telehealth service. Finally, we conclude with a brief introduction into the Telehealth Service Implementation Model (TSIM™), which was developed and matured out of the Medical University of South Carolina, one of only two HRSA-designated National Telehealth Centers of Excellence in the United States. TSIM is a guiding framework that was created to support the efficient and effective development, implementation, and long-term sustainability of high quality telehealth services.

Table 4.1 Factors impacting the success of telehealth services

Technology	Organizational structures	Change management	Economic feasibility	Legislation
Societal impacts	Perceptions	User-friendliness	Evaluation and evidence	Policy and governance

S. R. Valenta (✉)

Medical University of South Carolina, Johns Island, SC, USA

e-mail: valentas@musc.edu

M. Glanville

MUSC Center for Telehealth, Medical University of South Carolina, Charleston, SC, USA

E. Sederstrom

Department of Strategic Planning, OU Medicine, Oklahoma City, OK, USA

Barriers to the Diffusion of Telehealth

Since telehealth introduces a form of healthcare innovation into the traditional care delivery system, it is impacted by similar factors that can be a barrier to the adoption of any new innovation or technology. Grigsby et al. first assessed the diffusion of telemedicine and the challenges of predicting a rate of adoption considering the many complex and dynamic factors impacting that process [2]. Tanriverdi and Iacono identified the following four key barrier categories for the diffusion of implementing telehealth services: (1) technical barriers, (2) behavioral barriers, (3) economical barriers, and (4) organizational barriers [3].

While technical barriers continue to decline with the increased adoption and knowledge of technology overall, there are still substantial hurdles to implementing a new telehealth technology platform or device. New technology often brings a level of anxiety or fear with the process of attempting something new, both for the providers and the patients. This hesitancy should not be underestimated, but instead, it should be accounted for and addressed with adoption processes and procedures. Healthcare organizations need to ensure that there are processes in place to properly educate, train, and support healthcare providers and patients with telehealth technology.

Behavioral barriers to telehealth adoption can be significant as many people are hesitant to change. The integration of telehealth services into the traditional clinical workflow can be extremely disruptive, and early development and implementation challenges and resistance to change are to be expected, requiring effective change management to overcome those challenges. The following four key components have been associated with effective change management: (1) change leadership, (2) employee (team) engagement, (3) communication, and (4) employee (team) commitment [4]. Telehealth champions have been determined to be crucial in executing successful change leadership by helping to promote the telehealth service, legitimize the initiative, and build relationships with key stakeholders along the way [5]. In addition, establishing a systematic way to develop and implement telehealth services with clear roles and responsibilities will improve team and provider engagement, ultimately increasing the likelihood of creating a successful telehealth service.

Economical barriers can be both internal and external to an organization. Examples of internal economical barriers may include limited funding (i.e., budget) for telehealth initiatives and poor understanding or execution of effective telehealth business models. Establishing a governance structure with sophisticated financial planning and management will help optimize the budget and create sustainable telehealth services. The most significant external economical barrier is the limited and variable telehealth reimbursement policies across the country. While telehealth policies continue to improve overall, reimbursement is often cited as a major barrier to telehealth adoption [6]. As telehealth policies continue to evolve, the telehealth services must adapt with those changes. It is imperative to have strong billing compliance expertise involved in the telehealth service development process. As telehealth reimbursement rules mature, organizations should have a process to review those changes and adapt the telehealth services to optimize revenue collections.

Organizational barriers are rooted in the challenges of integrating telehealth services into the traditional organizational structure and existing clinical workflows. Organizations often struggle with scaling telehealth pilots into successful, sustainable services, because telehealth services are often developed as siloed initiatives outside of the existing system [1]. Organizations need to establish formalized processes and provide institutional support to integrate telehealth services into their existing healthcare system. By having a systematic way to plan, prioritize, develop, implement, and promote telehealth services, organizations will be able to navigate many of the complex factors that have historically challenged the integration of telehealth services into the traditional healthcare system.

Seven Core Principles for the Successful Development of Telemedicine Services

Yellowlees emphasized that effective change management was at the core of successfully developing telehealth services and that the costs, both financial and psychological, of failing to implement a telehealth service properly could have a significant long-term negative impact on a healthcare organization [7]. He notes that very little telehealth advancement occurred in the 1980s, potentially due to many of the failures that occurred with telehealth projects of the 1960s and 1970s. Yellowlees said that the most significant lesson learned when implementing a telehealth service is that it must be integrated into the existing healthcare environment. He identified the following seven core principles as likely to improve the chances of developing successful telehealth services: (1) telemedicine applications and sites should be selected pragmatically, rather than philosophically, (2) clinician drivers and telemedicine users must own the systems, (3) telemedicine management and support should follow best-practice business principles, (4) the technology should be as user-friendly as possible, (5) telemedicine users must be well trained and supported, both technically and professionally, (6) telemedicine applications should be evaluated and sustained in a clinically appropriate and user-friendly manner, and (7) information about the development of telemedicine must be shared. When applying these core principles to the current practice of developing and implementing telehealth services, some common themes are present.

- Principle 1: Telemedicine applications and sites should be selected pragmatically, rather than philosophically

Sometimes telehealth service ideas come from healthcare executives without clinician involvement, and this can lead to a project being initiated without a physician champion identified and/or provider capacity available to deliver the service. Telehealth initiatives need “champions” to navigate the many complex factors and change management challenges of integrating a telehealth service into the traditional system. In addition, telehealth services should be created based on current demand. While a gap analysis may show data that a particular area has a “need” for a clinical service, unless the local healthcare providers or patients demonstrate a

“demand,” that telehealth service will likely suffer from low utilization. Finally, the telehealth service should address a problem of increasing access, improving quality, and/or reducing costs. Telehealth services should not be implemented if the problem they are intended to solve cannot be articulated.

- Principle 2: Clinician drivers and telemedicine users must own the systems

This principle really focuses on the importance of the physician champions and their involvement in selecting the technologies that they, and their colleagues, will use to transform the way they deliver care. Technology should be selected objectively and be led by the needs of the clinical service. This is a key component of the change management process and one that is often overlooked by many organizations. The users must feel comfortable with the technology and have a level of buy-in to help navigate any early implementation challenges.

- Principle 3: Telemedicine management and support should follow best-practice business principles

Yellowlees warned of putting the responsibility of telehealth implementations on “project teams” that lack both clinical and practical telehealth experience. Some organizations place themselves at risk of this if they run their telehealth teams out of their information technology (IT) departments and too much focus is placed on the technology. Telehealth is not an IT project; it is the implementation of a new clinical service. Between the two, there is a significant difference in skillset required for a successful development and implementation process. Many organizations have found success by centralizing their telehealth support teams and standardizing their processes, but a strong clinical strategy and physician champions should be at the core of those telehealth teams.

- Principle 4: The technology should be as user-friendly as possible

Some of the early challenges with telehealth technology was that the solutions were often big and bulky, expensive, and difficult to use. As technology continues to evolve, the telehealth solutions on the market are transitioning to be more computer-based systems that are easier to use and less expensive. In order to achieve full adoption of telehealth, the technology must be user-friendly and integrate seamlessly into a clinician’s workflow. If the use of the technology becomes a burden on the clinician’s workflow and clinical efficiency, utilization will suffer, and the telehealth service will eventually fail.

- Principle 5: Telemedicine users must be well trained and supported, both technically and professionally

Yellowlees recommended that if a telehealth team was to have one motto it should be “Train, train and train again.” He placed a lot of focus on getting providers used to the technology in non-clinical activities, such as meetings and educational sessions. As telehealth has continued to advance and technology has become more prevalent, the most vital component of training is on executing the workflow effectively. As telehealth has become more integrated into the traditional delivery

system, the training on the workflow is not only specific to the provider. Supporting departments, such as an admit transfer center receiving a call for a time-sensitive telestroke consultation, and supporting personnel (e.g., tele-presenter) must also be trained and demonstrate proficiency of their roles and responsibilities. In addition, training on appropriate telehealth documentation and billing is important to stay compliant with state and federal regulations and maximize reimbursement opportunities. Organizations need a systematic way to train providers prior to go-live, review the process to assess competency, and provide ongoing support to make adjustments and improvements along the way as the service continues to evolve.

- Principle 6: Telemedicine applications should be evaluated and sustained in a clinically appropriate and user-friendly manner

In an ever-changing reimbursement system that continues to shift toward value-based payments, organizations need to understand successful telehealth business models and be able to evaluate the value of their investments. In order to be able to successfully sustain telehealth services, outcome metrics should be established to continually evaluate financial and operational performance. Identifying key performance metrics will assist organizations with improving telehealth service delivery to ensure they are meeting the needs of all relative parties, including assessing their own value on investment.

- Principle 7: Information about the development of telemedicine must be shared

Yellowlees stressed the importance of deeper research on telehealth services. While telehealth research has definitely evolved over the last couple of decades, well-designed, high quality scientific research is still limited in the field of telehealth. Telehealth has been proven to show a high satisfaction by a majority of patients [8], but more health economic research needs to be conducted to examine the cost-effectiveness of new delivery models. While some delivery models such as telestroke have demonstrated cost-savings [9], other modes of telehealth, such as direct-to-consumer telehealth for acute respiratory infections, may increase utilization and healthcare costs [10]. More information and research on telehealth must be shared to improve the overall cost-effective and high quality delivery of care.

Five Factors Influencing Service Integration

Finch et al. completed a longitudinal qualitative study that assessed 12 teledermatology services and identified the following five factors that supported the successful integration of those services: (1) policy context, (2) perceived benefit and related commitment, (3) evidence gathering to prove safety and manage risk, (4) reorganizing services, and (5) issues surrounding professional roles and boundary crossing [11]. These five themes and relative factors were identified as either promoting or impeding successful integration of the teledermatology services into the traditional health system.

The context of policy continues to be one of the most relevant factors to telehealth adoption. In the United States, the variability and gaps in telehealth reimbursement policies have made it significantly challenging to create sustainable business models and accelerate adoption of new telehealth technologies and services. In addition, individual state medical boards have often placed restrictions on which medical providers can deliver telehealth services. Until there is more of a national push to simplify payment and licensure issues, many organizations will continue to be slow to adopt telehealth services.

The concept of “perceived benefit and related commitment” can still be a barrier to telehealth integration if the relative stakeholders cannot clearly articulate why the service is being implemented. “What problem does this telehealth solution solve?” should be the first question asked during the planning process when a clear strategy for the telehealth service is being crafted. The service is doomed for failure if that question cannot be answered, but that is not sufficient enough. The answer to that question must be communicated effectively to support successful change management.

In order for large-scale telehealth adoption to occur, processes to support safe, evidence-based care must be matured and risk must be accounted for and managed. The teledermatology services that were successfully sustained were ones that accounted for potential risks and built safeguards into the system to address those issues. An example of this concept can be highlighted when reviewing virtual urgent care, or “direct-to-consumer,” services. Concerns have been expressed that direct-to-consumer telehealth visits may pose a risk of increasing the use of antibiotics in children [12]. When risks to safety or quality are identified, it is imperative to account for and act to mitigate or eliminate that risk. For antibiotic usage in direct-to-consumer services, this can be accomplished through formalized quality review processes to assess antibiotic stewardship and adherence to clinical guidelines.

The concept of reorganizing services emphasized that users of telehealth services needed to make continual modifications in order for the service to be successful. A key part of that is understanding the current clinical workflow that the telehealth service is bound to disrupt. Organizations often spend too much time focusing on the technology and not nearly enough time on the process. Organizations need to establish a systematic way to design the new telehealth service, to train and support providers, to assess for ongoing competency with the process, and to continuously identify and execute on process improvement opportunities.

The introduction of telehealth services can also impact the traditional role of different healthcare professionals. In the case of the teledermatology services, there were concerns about an attempt to push too much responsibility toward primary care, but those that demonstrated more flexibility with the process were able to implement successful services. Since telehealth is expected to disrupt the current system, ideally, organizations will capitalize on that opportunity and get different healthcare providers practicing at the top of their license. To realize that potential, policies must be in place to support this transformation. Telehealth has the opportunity to efficiently connect numerous healthcare providers along the care continuum compared to the traditional delivery system.

Advancing Telehealth Service Development and Delivery

Telehealth is experiencing exponential growth, and while resources such as implementation checklists are available to guide early-stage adoption, comprehensive and practical resources to develop and manage telehealth services from the initial idea to sustainable operations are limited. The Telehealth Service Implementation Model or TSIM™ was created to address this need and formalize a guiding framework to support the efficient and effective development, implementation, and long-term sustainability of high quality telehealth services [13]. TSIM was originally implemented at the Medical University of South Carolina (MUSC) in order to enable an institutional goal of comprehensive, enterprise-wide telehealth integration, but the model can serve as a clear guide to any organization attempting to navigate the many complexities of telehealth service development and delivery.

The MUSC Center for Telehealth (Center) was established in 2013 and built upon an 8-year legacy of providing telehealth services that addressed health disparities, initially maternal fetal health, and stroke care, across South Carolina (SC). The founding of the Center was catalyzed by a SC legislative mandate and funding to develop telehealth infrastructure and services that would increase access to care and reduce health disparities. This legislative charge led to the rapid development and expansion of telehealth at MUSC, culminating in over 80 unique telehealth services being offered at over 300 clinical sites across the state within 6 years. Annual telehealth interactions increased from 15,315 to over 308,000 during this time period with 78% of MUSC's services delivered to fully or partially medically underserved SC counties. During this rapid growth phase, the Center experienced meaningful successes and encountered numerous challenges, which have all contributed to the development of the Telehealth Service Implementation Model or TSIM.

There are many challenges and complexities to telehealth service development and, as highlighted by van Dyk, no existing holistic framework to address these. Inspired by van Dyk and the success of established frameworks (e.g., ITIL® for IT service management [14]), MUSC sought to develop a novel framework specifically for successful telehealth implementation. TSIM includes six phases: (1) Pipeline, (2) Strategy, (3) Development, (4) Implementation, (5) Operations, and (6) Continual Quality Improvement. Each phase has associated tasks that must be completed before a service advances to the next phase.

The TSIM framework establishes a holistic approach to incorporating all of the factors that can impact telehealth success, and it provides a common terminology to improve communication between team members. In addition, TSIM allows for a systematic approach to service development, implementation, and service management. The Pipeline phase serves as the entry portal for new telehealth ideas. The Strategy phase ensures that the scope of the telehealth service is clearly defined, and the Development phase is when the service is built, accounting for key steps that must be reviewed and addressed and key stakeholders that must be engaged. In the Implementation phase, providers are trained on the workflow and technology, mock calls are completed, and the operational and technical teams support the go-live

process. In Operations, the focus shifts to delivering high quality, reliable telehealth services that continue to improve the patient and provider experience. Continual Quality Improvement occurs throughout the framework, identifying and optimizing process, people, and platform problems.

Ultimately, TSIM enables teams to proactively recognize program strengths, weaknesses, and gaps in service development, implementation, and delivery. TSIM has contributed to MUSC becoming nationally recognized for its extensive breadth and depth in telehealth program development, implementation, and evaluation, and in 2017, MUSC was formally designated by the Health Resources and Services Administration (HRSA) as a National Telehealth Center of Excellence.

Conclusion

Telehealth service development is extremely challenging when attempting to integrate telehealth services into the existing healthcare system. There are many complex factors that have to be considered and numerous stakeholders that must be engaged throughout the process. Historical challenges have impeded adoption, which can have a significant negative impact on telehealth investments. However, success is achievable, and a guiding implementation framework, such as TSIM, can be a major catalyst to telehealth adoption and success at any organization.

References

1. Van Dyk LA. Review of telehealth service implementation frameworks. *Int J Environ Res Public Health*. 2014;11:1279–98.
2. Grigsby J, Rigby M, Hiemstra A, House M, Olsson S, Whitten P. Telemedicine/telehealth: an international perspective. The diffusion of telemedicine. *Telemed J E Health*. 2002;8:79–94.
3. Tanriverdi H, Iacono CS. Knowledge barriers to diffusion of telemedicine. In: Proceedings of the international conference of the association for information systems, Helsinki, Finland, 14–16 August 1998. p. 39–50.
4. Makumbe W. Predictors of effective change management: a literature review. *Afr J Bus Manag*. 2016;10(23):585–93.
5. Wade J, Elliott J. The role of the champion in telehealth service development: a qualitative analysis. *J Telemed Telecare*. 2012;18(8):490–2.
6. Kruse CS, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: a systematic review. *J Telemed Telecare*. 2018;24(1):4–12.
7. Yellowlees PM. Successfully developing a telemedicine system. *J Telemed Telecare*. 2005;11(7):331–5.
8. Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' satisfaction with and preference for telehealth visits. *J Gen Intern Med*. 2016;31(3):269–75.
9. Switzer JA, Demaerschalk BM, Xie J, Fan L, Villa KF, Wu EQ. Cost-effectiveness of hub-and-spoke telestroke networks for ischemic stroke from the hospitals' perspectives. *Circ Cardiovasc Qual Outcomes*. 2013;6(1):18–26.

10. Ashwood JS, Mehrotra A, Cowling D, Uscher-Pines L. Direct-to-consumer telehealth may increase access to care but does not decrease spending. *Health Aff.* 2017;36(3):485–91.
11. Finch TL, Mair FS, May CR. Tele dermatology in the UK: lessons in service innovation. *Br J Dermatol.* 2006;156(3):521–7.
12. Ray KN, Shi Z, Gidengil CA, Poon SJ, Uscher-Pines L, Mehrotra A. Antibiotic prescribing during pediatric direct-to-consumer telemedicine visits. *Pediatrics.* 2019;143(5):e20182491.
13. MUSC (forthcoming). The Telehealth Service Implementation Model (TSIM): a comprehensive guide to telehealth implementation (9780117092129). TSO, London.
14. Axelos. ITIL-IT service management. Axelos Global Best Practice; 2019. <https://www.axelos.com/best-practice-solutions/itil>. ITIL® is a (registered) Trade Mark of AXELOS Limited. All rights reserved.