

TSIM: The Telehealth Framework

A comprehensive guide to telehealth implementation and optimization





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Foreword

TSIM: A framework for change

In March 2020, the world faced an existential threat. The global pandemic that was caused by a virus brought everything to a screeching halt. COVID-19 changed the paradigms we had grown accustomed to. In order for an organization to survive, regardless of product or service, it had no choice but to change with immediacy, and this was often done with limited hindsight or foresight. Healthcare was one area that impacted all of us. Individuals in need of routine medical care and the medical personnel providing this care had to communicate mostly via telemedicine, telehealth, or not at all – which was, and remains, a challenge for many.

Throughout the 20th century, the idea of providing healthcare remotely over some distance has been like a rollercoaster at an amusement park. Even though the technology was slowly changing, the idea of changing anything was even slower. Government funding for research projects and testbeds ramped up then declined, only to ramp up and decline again. This cycle was finally broken at the turn of the 21st century, primarily due to innovation in computing and telecommunications. Tempered by the inherent need in space exploration and on the battlefield, and the insatiable desire to reduce cost and improve care, telemedicine and telehealth began to be more acceptable as a mode of healthcare delivery. Yet, it remained elusive for many, simply because of attitude, awareness, and a lack of standard program development and operations.

Telehealth has seen unprecedented growth as a direct result of the global pandemic, with rapid increase in the integration and adoption of telehealth in clinical settings worldwide. What took decades to become accepted practice literally changed overnight. Across the landscape of America's academic health centers, several ecosystems have established themselves as true leaders. The Medical University of South Carolina (MUSC) is one such example. It has embraced change in an effort to address the healthcare needs across its state and region.

MUSC began its telehealth journey in 2005 with an innovative endeavor to improve maternal fetal health in a rural, medically underserved region of the state. After several years of gaining traction and experience with a wide variety of telehealth applications, the program was recognized by the American Telemedicine Association in 2019 as a leading program in the US. In addition, MUSC is one of only two HRSA-designated National Telehealth Centers of Excellence in the US. The Telehealth Service Implementation Model (TSIM) framework developed by MUSC, and now adopted by organizations across the US, supports health systems in developing, implementing, and maintaining a telehealth solution.

The TSIM framework was created using a foundation of telehealth best practices and has continued to mature through MUSC's vast experience in telehealth service development and implementation. TSIM utilizes common terminology for the development of services and provides standardized processes to address specific telehealth issues. TSIM is comprised of six phases:

- Pipeline (which flows into the broader TSIM structure)
- Strategy
- Development
- Implementation
- Operations
- Continuous Quality Improvement.

Each phase has associated tasks that must be reviewed and, if applicable, completed before a service advances to the next phase.

These six stages of the TSIM framework serve as a roadmap to successfully develop, implement, and sustain telehealth services. TSIM provides an architecture and terminology to enhance the clinical, technical, and administrative collaboration required to successfully establish and provide effective telehealth services that are integrated into the traditional care delivery system, and are of high utility to both patient and provider. In addition, it provides strategic principles and philosophies that aid in redesigning care delivery (not simply using video to replicate the existing inefficiencies and in-person processes). TSIM is currently being adopted by healthcare organizations across the US, helping to simplify the complexities of telehealth service development, implementation, and management.

This unique publication brings together information and guidance to enlighten the reader with knowledge that can be put to use immediately. TSIM provides telehealth teams, both clinical and technical, with a systematic approach and common language to proactively recognize their strengths, weaknesses, and gaps in service development, implementation, and management. The TSIM model provides an excellent resource for all involved in developing and deploying telemedicine and telehealth.

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Preface

Telehealth is rapidly advancing along the diffusion-of-innovation curve. Early innovators, such as Dr. Jay Sanders, Charles Doarn, and Dr. Rashid Bashur, identified telehealth service development and implementation challenges, and began illuminating a pathway forward. Subsequent innovators, such as the Medical University of South Carolina (MUSC), advanced telehealth through a focus on clinical strategy and a vision to apply telehealth to improve the efficiency and effectiveness of patient care.

The public health emergency caused by the COVID-19 pandemic resulted in such a pervasive uptake of telehealth that telehealth is now solidly in the early-majority phase of the adoption curve. What the field is lacking is a comprehensive and practical “how to” guide for successful telehealth service development, implementation, and sustainment. TSIM is that guide and has simplified the complexities of telehealth implementation and optimization. TSIM will take users from an initial telehealth idea to successful program sustainment by leading them through the development of a strategy-driven telehealth approach, structured program development pathways, outcomes-driven evaluation, financial sustainability, and ongoing operations.

Our goal is that the TSIM framework will catalyze a new renaissance in digital health adoption, moving more service ideas towards the journey to scale. It is time to apply telehealth to forge new models of healthcare delivery and a system that delivers high-quality, cost-effective, and equitable care.

Shawn Valenta

Editor

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Overview



1.1 Introduction

The United States healthcare industry is in the midst of a digital transformation, striving to reform, strengthen, and modernize the nation’s healthcare system. The US spends more money per capita on healthcare than any other country. When reviewing healthcare expenditures as a percentage of the gross domestic product (GDP), it can be seen that the US spends nearly twice as much as other similar nations. In addition, it has fewer practicing physicians as a percentage of the population, which may be driving fewer physician visits. Simultaneously, the US has among the highest rates of obesity and chronic disease burden. Fueled by increased healthcare spending, provider shortages, and an aging population, a shift towards more efficient, effective care is imperative.

The United States Health Resources & Services Administration (HRSA) defines *telehealth* as “the use of electronic information and telecommunication technologies to support long-distance clinical health care, patient and professional health-related education, public health, and health administration.” Telehealth has been identified as an effective tool to address many of the challenges of the US healthcare system, including reducing cost, increasing access, and improving quality.

As record-setting investments further catalyze the development of telehealth solutions, many healthcare providers are expected to move forward in their digital transformation efforts. Unfortunately, barriers to telehealth development and implementation have historically frustrated healthcare providers, and continue to do so. Hospitals and physician practices, especially those in rural regions, that do not adapt to the evolving healthcare environment and adopt telehealth capabilities will likely not survive in their present forms. Without a systematic telehealth implementation approach, healthcare providers should expect continued frustrations and varied results.

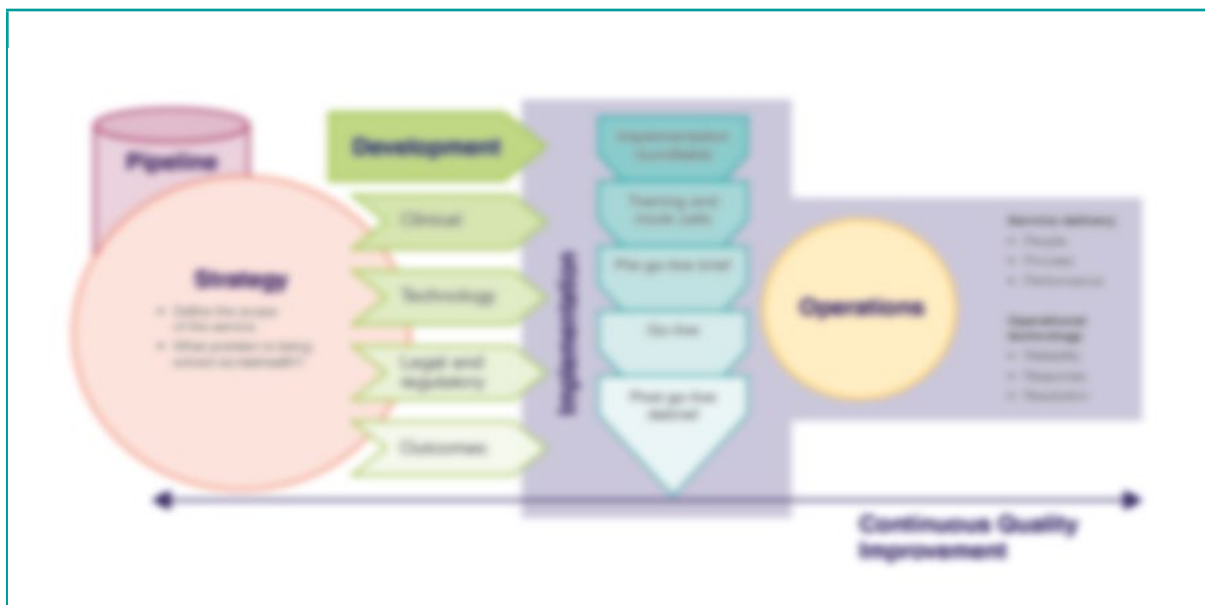


Figure 1.1 Overview of TSIM

This introduction to the Telehealth Service Implementation Model (TSIM) is intended to support health systems and providers on their journey to advance the adoption of telehealth development and implementation (see Figure 1.1). TSIM is a guiding framework that has evolved out of the extensive telehealth experience at the Medical University of South Carolina (MUSC), one of only two HRSA-designated National Telehealth Centers of Excellence in the US.

The TSIM framework was created with a foundation of telehealth best practices, and has continued to mature through MUSC's vast experience in telehealth service development and implementation. TSIM establishes common terminology for the development of services and provides standardized processes to address specific telehealth issues. It includes six phases:

- Pipeline (which flows into the broader TSIM structure)
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Each phase has associated tasks that must be reviewed and, if applicable, completed before a service advances to the next phase. TSIM provides telehealth teams, both clinical and technical, with a systematic approach and common language to proactively recognize their strengths, weaknesses, and gaps in service development, implementation, and management.

This guide will introduce the phases and key concepts of TSIM and provide foundational knowledge on how to establish the organizational structure and governance to successfully develop and manage telehealth services. Simultaneously, a fictional provider organization, *Ohio River Health System*, will be followed to demonstrate the TSIM concepts in action while developing and implementing telehealth services (see Appendix). Telehealth holds the potential to significantly improve the way healthcare is delivered and accessed, and TSIM provides the roadmap for national digital transformation that results in telehealth for efficient, effective, and higher-quality care for patients.

1.2 Brief history of telehealth

The modern-day version of telehealth originated as early as 1948 with the short-distance transmission of radiologic images by telephone lines between West Chester and Philadelphia, Pennsylvania. Medical video communications began in 1959 when clinicians at the University of Nebraska used two-way interactive television to send neurological examinations across campus. In 1963, Massachusetts General Hospital established a telecommunications link to connect its providers with a medical station staffed by nurses at Logan Airport.

As many of these programs continued to mature throughout the 1960s and 1970s, the US government, with an interest in delivering medical services to astronauts and rural, isolated areas, began to invest significant funding into telehealth research through the Department of Health, Education and Welfare (now known as the Department of Health and Human Services, or DHHS) and the National Aeronautics and Space Administration (NASA).

Unfortunately, a majority of the early investments made, and programs started, were not sustainable, and interest in telehealth appeared to decline in the 1980s. In the 1990s, enthusiasm in telehealth began to reemerge with the increased adoption of the internet. National organizations and federal departments devoted to telehealth began to organize, and teleradiology and telepsychiatry began to achieve broad adoption. Teleradiology has been so successful that it has become a standard of radiology care and is rarely even referred to as “telehealth” anymore.

In the 2000s, state and federal agencies continued to push for and invest in technological advancements in healthcare. Specifically, significant federal investments were made to catalyze the adoption of electronic health records. In addition, federal funding was allocated to establish telehealth resource centers across the US to help navigate the complexities of telehealth adoption. While some states began to organize their own telehealth networks, the delivery of telehealth was still limited to innovators in the field.

The Affordable Care Act (ACA) was enacted in 2010, initiating a transformational movement towards a value-based healthcare system. While the transition away from the historical fee-for-service (FFS) reimbursement system continued at a slow pace, the ACA inspired a new wave of early telehealth adopters as forward-thinking health systems began to invest their own resources in telehealth infrastructure and services.

1.3 The pandemic shift to virtual

In 2020, healthcare organizations across the world experienced a historic explosion of telehealth utilization, fueled by the COVID-19 pandemic and telehealth waivers in the US that removed many historical regulatory barriers. The pendulum of healthcare encounters swung heavily into virtual care out of a necessity to minimize further risk of exposure to the virus. Healthcare organizations across the US demonstrated significant increases in telehealth utilization. At the federal level, the Centers for Medicare and Medicaid Services (CMS) published a report that noted that 43.5% of Medicare primary care visits in April 2020 were conducted via telehealth, compared with only 0.1% in February 2020. The pandemic helped advance telehealth years along the adoption curve. Many patients and providers were using telehealth for the very first time, opening their eyes to its potential for patient convenience and provider efficiency. According to a McKinsey report, about 20% of healthcare could be conducted virtually.

But as the pandemic evolved and clinics started to reopen, the pendulum began to shift back towards in-person care. It was clear that a hybrid model (i.e. a combination of telehealth and in-person healthcare) was going to be part of the new normal. However, the shift back to in-person care exposed many of the vulnerabilities in the rapid telehealth implementations that occurred over the previous year.

Early in the pandemic, many organizations distributed a simple workflow and a video client to their physicians in the rush of the emergency. Other organizations encouraged providers to move to telephone interactions exclusively. In fact, about one-third of the Medicare beneficiaries who received a telehealth visit only received a telephone call. In addition, providers were concerned about how they would navigate the end of the public health emergency waivers that removed many of the regulatory and payment barriers. Unless there was an existing telehealth infrastructure already established, most organizations did not have the time to methodically develop and implement their telehealth services, and most of the emergent telehealth capabilities were developed external to, and not integrated with, their traditional delivery system.

1.4 Historical challenges to telehealth development and implementation

Unfortunately, many of the challenges that impaired the success of telehealth pioneers were never fully overcome. The technical, behavioral, economic, and organizational barriers identified in the late 1990s persist more than 20 years later. While a foundation of principles was established for successfully developing telehealth systems, most organizations lacked a standard approach to implement those principles into action consistently. Common themes that influence successful integration of telehealth services have been identified. However, without a common guiding approach and nomenclature, healthcare organizations continue to struggle with successfully developing and implementing telehealth services.

While the COVID-19 pandemic catalyzed an unprecedented level of telehealth adoption out of necessity, the majority of the rapid implementations were temporary solutions and not a standardized approach in developing high-quality, sustainable services integrated into the traditional delivery system. The pandemic also highlighted existing health disparities involving digital technology, health literacy, and internet access that should be accounted for and addressed in new telehealth delivery models. While the pendulum of telehealth utilization initially swung high during major shifts towards virtual care, organizations then began to experience the pullback and struggled to navigate how to establish a hybrid in-person and telehealth model. As investments in telehealth technologies continue to hit all-time record highs, it is advantageous for healthcare organizations to invest in the education and training of personnel who will be charged with developing and implementing the successful telehealth services that will transform clinical care delivery.

1.5 History of the MUSC Center for Telehealth and the creation of TSIM

The MUSC began its telehealth journey in 2005 with an innovative endeavor to improve maternal fetal health in a rural, medically underserved region of the state. Shortly thereafter, a telestroke network began development in an area of the US known as the Stroke Belt. Over an eight-year period, physician innovators at MUSC continued to develop telehealth services through grassroots initiatives and ad-hoc funding mechanisms to mitigate health disparities across South Carolina. In 2013, with around a dozen MUSC telehealth services functioning at different levels of maturity, the South Carolina Legislature invested telehealth funding through MUSC. MUSC was charged with creating a statewide telehealth network and developing telehealth services that addressed the needs of South Carolina communities.

Catalyzed by the state support, the MUSC Center for Telehealth (the “Center”) was founded in 2013, and an effort to organize the existing telehealth services was initiated. Simultaneously, the Center led an organizational movement to rapidly develop telehealth services across the health system. In addition to the state’s legislative mandate, MUSC’s chief executive officer asserted a bold vision that “any clinical services we deliver *inside* our walls, we should be able to deliver *outside* our walls.”

In a parallel effort, the Center organized a statewide strategic planning process to engage telehealth stakeholders from across the state. In 2014, MUSC published the first statewide telehealth strategic plan, resulting in the creation of the South Carolina Telehealth Alliance (SCTA). The SCTA, headquartered at MUSC, is a statewide collaborative bonded by a shared vision that *telehealth will grow to support the delivery of healthcare to all South Carolinians*. The SCTA was later recognized by the American Telemedicine Association as the sole winner of its 2019 President’s Award for Transformation of Healthcare Delivery.

As MUSC pushed for rapid adoption of telehealth services across the organization, the Center began to experience growing pains due to structural and process deficiencies. Shawn Valenta, who became MUSC’s first Director of Telehealth in 2013, had previously demonstrated nationally recognized success in structure and process improvements when leading initiatives within MUSC’s respiratory therapy (RT) department. Valenta led a high-performing RT team through initiatives that resulted in MUSC being one of only three respiratory care departments in the US recognized by the University Health Consortium (UHC, now known as Vizient) for significant cost reduction and quality improvement.

As a former advanced cardiovascular life support instructor, Valenta was used to working in collaborative teams using common terminology, algorithms, and protocols to efficiently manage complex medical emergencies, but equivalent standards for developing and implementing telehealth services seemed absent in the industry. Valenta began to research telehealth development and implementation models, but found limited information beyond what MUSC’s experience had already revealed. The article “A review of telehealth service implementation frameworks” by Liezl Van Dyk further validated the lack of a comprehensive, practical roadmap for telehealth service implementation, and Valenta agreed with Van Dyk’s conclusion that “a

holistic implementation approach” was needed. Concurrently, MUSC had begun an information technology (IT) service management initiative adopting the ITIL® framework and Valenta had seen the benefits of using a shared language and common set of principles and practices. The convergence of these factors helped Valenta and other MUSC leaders recognize that the best way to help the Center develop and implement sustainable telehealth services was to create its own holistic telehealth framework based on their standardized processes and common terminology.

With the support of a standardized approach to telehealth service development, MUSC grew telehealth interactions to nationally recognized volumes and demonstrated substantial improvements in patient outcomes. It also rapidly expanded existing services and concurrently developed new telehealth programs. It became known for both breadth and depth of telehealth services, and in 2017 received the distinction of being one of the first National Telehealth Centers of Excellence in the US. This federal designation, offered by the HRSA, also came with funding to invest in the continued development and rigorous scientific evaluation of telehealth services. Through these efforts and the journey of continuous quality improvement, MUSC has matured the TSIM framework such that it can inform the telehealth aspirations of any health system or provider.

1.6 Purpose of the TSIM guide

This TSIM guide is intended for telehealth leaders and teams that are responsible for their organization’s digital transformation efforts. These efforts could be large-scale, full-enterprise adoption of telehealth services, or simply improving on the direct-to-patient ambulatory telehealth services that were implemented during the pandemic. Either way, telehealth teams must navigate the complexities of telehealth service development and implementation that transect almost every department in the organization.

TSIM serves as a roadmap to successfully develop, implement, and sustain telehealth services. It provides an architecture and terminology to boost the clinical and technical collaboration required to successfully design high-quality, highly reliable telehealth services that are integrated into the traditional care delivery system. In addition, it provides strategic principles and philosophies that aid in redesigning care delivery and not simply using video to replicate the existing inefficiencies of in-person processes. Finally, it helps teams identify strengths and weaknesses within their structure and processes for continued improvement. With significant investments being made in telehealth technologies, TSIM is an investment into the people who are charged with deploying and integrating these technologies into user-friendly and financially sustainable models of care delivery.

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