

Integration of Quality into Operations Planning

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ABSTRACT

This paper proposes a novel approach to embed quality into healthcare operational planning by integrating risk management, project management, and improvement science. Historically rooted in industrial quality methods, these disciplines are essential for addressing the limitations of traditional reactive healthcare planning. Drawing from manufacturing practices and quality theorists such as Shewhart, Deming, Juran, and others, the authors present a model for operationalizing quality and safety through evidence-based tools. The discussion explores how healthcare can adopt this integrated strategy to align strategic objectives with operational controls, reduce variation, and improve resilience and outcomes across healthcare systems.

Keywords: Healthcare, Traditional Components, Nursing, Improvement Science, Clinical Practice.

INTRODUCTION

Healthcare has long prioritized patient safety and quality; however, these principles have often been applied reactively and inconsistently across operational plans. Meanwhile, other industries have integrated quality more systematically using risk management, project management, and improvement science. This paper explores how healthcare organizations can operationalize these methods to ensure strategic objectives are met and quality is embedded into daily operations. By learning from industrial practices, healthcare can adopt a more proactive, data-driven approach to system improvement.

The purpose of this paper is to propose an alternative approach to enhancing healthcare system quality by leveraging and integrating risk management, project management, and improvement science. This approach is grounded in our experience and application of quality and safety theories, concepts, and principles in healthcare, juxtaposed with tactics drawn from other industries. While healthcare has consistently emphasized patient quality and safety, the foundational theories and

Vol No: 07, Issue: 02

Received Date: June 26, 2025

Published Date: July 21, 2025

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Citation: Sadovich J, et al. (2025). Integration of Quality into Operations Planning. Mathews J Nurs. 7(2):60.

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tools for achieving these goals were largely developed and refined in non-healthcare settings.

Traditionally, a healthcare operations plan provides

structure and resources for delivering existing services while strategic objectives focus on long term status of the organization. When unplanned or undesired events occur, structure is utilized to assess and correct the situation.



Figure 1. Traditional Components of Operational Planning.

This alignment does not enhance organizational resilience when inevitable setbacks occur. Reactive approaches tend to focus on short-term fixes after adverse events have already occurred. These fragmented efforts often overlook underlying system flaws, leading to repeated failures, increased costs, and preventable patient harm. A reactive model may address symptoms but rarely address systemic (root) causes, resulting in a cycle of inefficiency and risk.

METHODOLOGY

The methodology involves a conceptual synthesis of theories, models, and historical practices from manufacturing and healthcare quality domains. Key quality improvement tools and frameworks—including control charts, PDSA cycles, the Juran Trilogy, Lean Six Sigma, and systems thinking—form the foundation of this integration. Additionally, government and organizational strategies such as CMS's National Quality Strategy, and NAHQ's Competency Framework were analyzed to align operational tactics with national quality goals.

Since the early 1900s, manufacturing industries have been focused on the development of quality methods and science. A key component identified was standardization of processes to reduce variation and increase productivity. The use of time and motion studies, flow diagrams, the Shewhart control chart and the PDSA (Plan, Do, Study, Act) cycle are the primary tools. Taylor's scientific management methods, refined by Frank and Lillian Gilbreth from 1910 to the 1930s became the linchpin for achieving efficiency, cost reduction and competitive advantage [1]. Flow diagrams were used to translate work or procedures into actions and

decisions into a flow which defines the process and assists standardization. In the 1920s, Walter Shewhart focused on understanding measurement of variation. Shewhart developed visual statistical methods (control charts) to quickly learn from data to determine if the studies data is stable (predictable) or being affected by special causes (changes planned or unplanned) [2]. His first application determined the "one size fits all" soldier helmet by using actual head sizes of soldiers. He observed measurements from nature are stable or predictable (head sizes), but man-made processes are inherently riddled with changes which he labeled special causes. He used data (typically over time) to determine patterns to distinguish the difference [3].

Why is this important? Understanding this difference avoids unnecessary or costly overreaction or underreactions to data. In 1939, Shewhart also developed the "Shewhart Cycle" and revised it from a depiction of a straight line to a circle demonstrating a dynamic scientific process. Later, Deming built on the Shewhart Cycle by developing the PDSA cycle (Plan, Do, Study, Act) with Associates in Process Improvement (API). The PDSA cycle simplifies and uses the scientific method for testing changes and using the data generated to determine if a change is an improvement [4].

In the 1960s, Joseph Juran developed three key principles of quality management. First is the Pareto principle, the 80/20 rule, 20% of the causes account for 80% of the defects or costs. The second principle involves changing thinking from quality of the end product to a wider examination of human factors throughout the production process. This principle is fundamental to apply quality management to

service-related processes. The third principle, known as the Juran Trilogy, includes: quality planning (the design stage), quality control (ongoing inspections/audits and analysis to ensure processes are in control), and quality improvement (proactive refinement of processes to improve) [5].

The Japanese industries led the development of Lean, a methodology to eliminate waste in the 1950s. In the 1980s, Six Sigma was developed to improve and reduce variation in manufacturing at Motorola. Later in the 1990s, the combination of Lean and Six Sigma emerged integrating the principles of waste elimination and variation reduction [6]. In the 1980s, W. Edwards Deming's management principles gained wider acceptance due to national broadcast by NBC entitled, "If Japan can, why can't we". At the time of the Broadcast, Japan Inc was capturing markets around the world by focusing on quality [7]. Deming was introduced to a nationwide audience and business leaders flocked to get help. During this time, his work culminated in his book "The New Economics", published after his death in 1993. The book detailed Deming's evolution of the "System of Profound Knowledge", a leadership and management theory promoting organizational transformation [8]. In 1996, API published a book, The Improvement Guide which detailed the theory and use of the Model for Improvement (MFI). The MFI foundation was built on the theories of Deming, Juran, and Shewhart [9]. The Institute for Healthcare Improvement under the leadership of Dr. Don Berwick and in partnership with API began training healthcare professionals using the science of improvement [10].

While quality and safety has always been a focus of healthcare, there was a renewed focus on healthcare quality in 1999 when the Institute of Medicine (IOM) released the landmark remark report *To Err Is Human: Building a Safer Health System*. The report revealed widespread issues in patient safety and a lack of consistent quality across healthcare systems, sparking national efforts to improve care quality and safety, especially within nursing and clinical practice [11].

In 2001, the IOM published a second influential report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, which identified systemic barriers to high-quality care and proposed comprehensive strategies for redesigning healthcare systems. As part of this effort, the IOM outlined six domains of healthcare quality: Safe,

Effective, Patient-Centered, Timely, Efficient, and Equitable, later adopted and reinforced by the Agency for Healthcare Research and Quality (AHRQ) [12].

These reports influenced healthcare financing models, steering reimbursement from volume-based to value-based care using quality outcomes as measures. In 2005, the Centers for Medicare & Medicaid Services (CMS) launched its first pay-for-performance initiative, the Medicare Physician Group Practice (PGP) Demonstration. By 2012, CMS implemented the Hospital Value-Based Purchasing (HVBP) Program, further linking Medicare payments to the quality rather than quantity of care. In 2015, the Medicare Access and CHIP Reauthorization Act (MACRA) established the Quality Payment Program (QPP) to incentivize value-based care, improve outcomes, and enhance cost efficiency across the U.S. healthcare system [13]. In 2011, the Agency for Healthcare Research and Quality (AHRQ) released the National Quality Strategy (NQS), as mandated by the Affordable Care Act (ACA). The NQS aimed to improve healthcare quality, patient outcomes, and population health, serving as a framework for national initiatives in healthcare quality improvement and measurement [14]. In 2015, the National Association for Healthcare Quality (NAHQ) introduced the Healthcare Quality Competency Framework, outlining essential competencies for healthcare quality professionals. Later, NAHQ launched the Workforce Accelerator, a program designed to enhance the competency and standardization of the healthcare quality workforce, aiming to reduce variability and improve organizational quality and safety outcomes [15]. In 2020, the National Steering Committee for Patient Safety, convened by the Institute for Healthcare Improvement (IHI), released the National Action Plan to Advance Patient Safety. This plan centers on four foundational areas: culture, leadership, and governance; patient and family engagement; workforce safety; and learning systems [16]. In 2024, the Centers for Medicare & Medicaid Services (CMS) updated the NQS, focusing on four priority areas: equity and engagement; outcomes and alignment; safety and resiliency; and interoperability and scientific advancement [17].

This focus on value-based care also led to a greater importance on leadership, systems thinking, and learning organizations. Such as, the NAHQ view to transform the healthcare system by integrating quality at all levels of the

organization. NAHQ view is supported by the authors of the 2013 “Transforming Healthcare Leaders” and the 2024 “Quality as an Organizational Strategy”. The authors of the “Transforming Healthcare Leaders” integrate the principles of Deming’s System of Profound Knowledge, the API Model for Improvement, Shewhart’s statistical control charts, and Maccoby’s Strategic Intelligence to create a leadership model for a learning organization [18]. The authors of the 2024 “Quality as an Organizational Strategy” also integrate much of the same principles focusing on five key activities for leaders:

1. Establishing and communicating the purpose of the organization;
2. Viewing the organization as a system supported by a vector of key measures;
3. A system to obtain information;
4. Planning process for operating and improvement; and
5. Managing improvement efforts [19].

Today in healthcare quality, most efforts focus on measurement without the application of quality improvement methods and science focused on the organization’s processes. Quality improvement methods and science are typically used as part of specific projects but are not applied to achieve strategic goals and objectives that span the organization’s operations plan and operational controls. We suggest an approach that operationalizes concepts and theories to promote quality and safety at the strategic and the operational level in healthcare organizations of any size.

RESULTS

No new empirical data were collected. The paper synthesizes existing theories and frameworks into a proposed integrated approach but does not present original research findings. Figure 2 proposes a process to assess, prioritize and operationalize strategic direction through the creation of an actionable operations plan. Using improvement science and project management implementation of evidence-based solutions ensures strategic objectives are achieved.

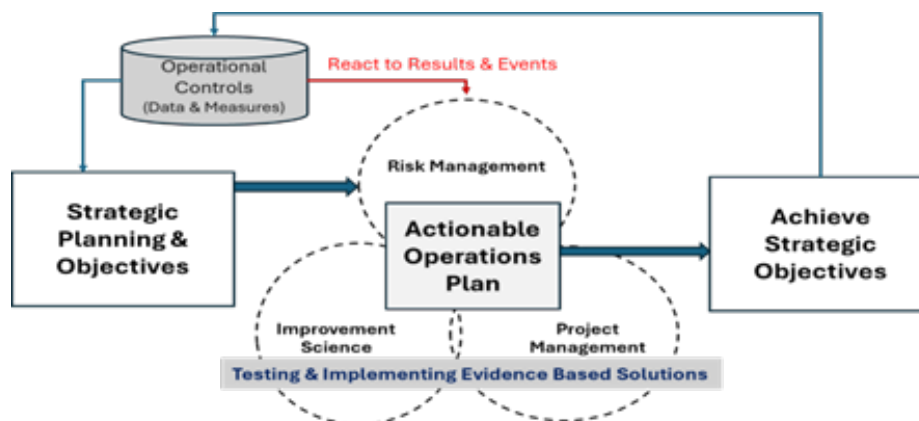


Figure 2. Proposed Components of Operational Planning.

By combining goals with data, organizations can identify risks, threats, and opportunities that require prioritization and structured action to ensure strategic objectives are achieved. Tools such as Failure Mode and Effects Analysis (FMEA) and Root Cause Analysis (RCA) may be used to gain deeper insight into these issues. Ultimately, an integrated strategy not only improves quality and safety but also strengthens organizational agility and financial stewardship in a complex and dynamic healthcare environment.

DISCUSSION

The proposed integration of risk management, project management, and improvement science is demonstrated through a model that connects strategic planning with operational controls. To develop an Actionable Operations Plan, each prioritized issue requires the formulation, assessment, and ranking of potential solutions along with a defined timetable. In some cases, solutions are known and proven; in others, they are hypothetical or lack sufficient

evidence regarding their effectiveness. Proven solutions should be executed through project management to ensure a coordinated, structured implementation. In contrast, untested ideas should be addressed through improvement science using Plan-Do-Study-Act (PDSA) cycles to test, measure, and validate effectiveness. Once validated, these solutions are incorporated into the policies and procedures for broader implementation. Ongoing monitoring of implementation status and emerging issues should be supported by established operational controls.

Not all issues originate from the strategic plan. Some issues emerge unexpectedly and require a reactive risk assessment to prioritize risks and develop solutions, independent of strategic objectives. In such cases, FMEA provides a general assessment, while RCA offers a detailed analysis of contributing system factors and generates a micro-plan with follow-up. Project management is instrumental in organizing and tracking the multiple tasks required to resolve issues identified by FMEA or RCA. It also provides a structure for assigning responsibilities and managing follow-up. However, to prevent recurrence, additional or untested interventions may be needed. These should be developed and evaluated through improvement science, which offer a structured approach to testing and refinement.

CONCLUSION

What can we learn from industry? Industry has continued to evolve strategic operational plans which routinely use sophisticated technology to integrate risk, project management and improvement methods throughout their organization. Technology creates the structure for standardization, productivity and cost reduction. In contrast, many healthcare organizations, especially small and medium size organizations, still rely on paper or basic technology such as Excel spreadsheets and Word. Healthcare adoption of technology for quality and productivity lags years behind industry. Industry recognizes manual intervention and coordination are time consuming and reduce productivity, make standardization difficult, and cost reduction targets invisible. They use technology to bridge these gaps and ensure they are cost competitive. Return on Investment (ROI) calculations are routine, based on time savings and productivity to justify innovation not only in the processes related to their products and services, but also in support and planning processes.

How can healthcare organizations implement this integrated approach? They can learn from industry and apply an integrated strategy to translate their strategic plans into actionable operational plans. This involves combining the principles of risk management, project management, and improvement science, all supported by enabling technology. Through coordinated risk management, healthcare executives can define, plan, and execute the operational activities needed to achieve strategic goals. Embedding quality into operational planning requires leaders to adopt and adapt proven methods from other industries. By uniting these disciplines and leveraging the right technologies, organizations can create practical, goal-aligned plans. This integrated approach enhances quality, safety, organizational agility, and financial stewardship. Ultimately, healthcare must close the gap between strategy and execution by using a systems approach rooted in established quality methodologies.

ACKNOWLEDGEMENTS

None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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