

Unlearning in Quality Management and Organizational Improvement: A Systematic Literature Review and Taxonomy Proposal

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Abstract

Organizational unlearning the deliberate process of discarding obsolete knowledge, routines, and assumptions has emerged as a critical yet underexplored dimension of quality management and continuous improvement. While the quality management literature extensively addresses learning mechanisms through frameworks such as Total Quality Management (TQM), ISO standards, and continuous improvement methodologies, the strategic necessity of unlearning outdated practices remains insufficiently theorized. This systematic literature review examines the intersection of unlearning and quality management across 87 peer-reviewed articles published between 2000 and 2025. Through thematic analysis and conceptual synthesis, we develop a comprehensive taxonomy that categorizes unlearning processes along five dimensions: triggers (crisis, technological disruption, cultural shift), levels (individual, team, organizational), mechanisms (forgetting, replacement, reframing), outcomes (quality performance, innovation capacity), and contexts (TQM implementation, ISO certification, digital transformation). Our findings reveal that unlearning plays a pivotal role in overcoming organizational inertia, enabling quality system adaptations, and fostering innovation within quality cultures. However, significant gaps exist regarding measurement approaches, the relationship between unlearning and sustained quality performance, and contextual factors moderating unlearning effectiveness. We propose a research agenda addressing these gaps and discuss practical implications for quality managers navigating increasingly volatile business environments. This taxonomy provides researchers and practitioners with a structured framework for understanding, implementing, and studying unlearning as a strategic quality management capability.

Keywords: organizational unlearning, quality management, continuous improvement, learning organization, taxonomy, systematic literature review, TQM, knowledge management, organizational change

Introduction

Contemporary quality management paradigms emphasize learning as a foundational capability for organizational excellence. The evolution from quality control to quality assurance, and subsequently to comprehensive quality management systems, reflects an accumulated body of knowledge and best practices (Juran & Godfrey, 1999). Total Quality Management (TQM), ISO 9001 quality management systems, Six Sigma, and Lean methodologies all rest upon the premise that organizations must continuously acquire, codify, and apply knowledge to improve processes, products, and services (Dean & Bowen, 1994). However, this learning-centric perspective harbors an inherent paradox: what organizations learn can simultaneously become a source of rigidity and competitive disadvantage when environmental conditions change. Hedberg (1981) first articulated this challenge by noting that "knowledge grows, and simultaneously becomes obsolete as reality changes" (p. 3). Organizational routines that once drove quality excellence may transform into constraints that inhibit adaptation to new customer expectations, technological possibilities, or competitive dynamics (Leonard-Barton, 1992).

Organizational unlearning refers to the intentional process through which organizations discard obsolete knowledge, outdated routines, ineffective practices, and dysfunctional assumptions that no longer serve their strategic objectives (Hedberg, 1981; Nystrom & Starbuck, 2015). Unlike simple forgetting—a passive decay of unused knowledge—unlearning constitutes a deliberate organizational capability requiring conscious effort, leadership commitment, and systematic processes (Tsang & Zahra, 2008). Theoretical perspectives on unlearning have evolved across three generations. First-generation research conceptualized unlearning primarily as the elimination of obsolete knowledge (Hedberg, 1981; Nystrom & Starbuck, 2015). Second-generation scholars

emphasized unlearning as a prerequisite for new learning, focusing on cognitive and behavioral change processes (Akgün et al., 2007; Becker, 2005). Contemporary third-generation research views unlearning as a dynamic organizational capability integral to ambidexterity, innovation, and strategic renewal (Cegarra-Navarro & Wensley, 2019; de Holan & Phillips, 2004).

Several contemporary trends underscore the criticality of unlearning within quality management contexts. The integration of artificial intelligence, Internet of Things (IoT), and data analytics into quality systems requires organizations to unlearn traditional quality control approaches and embrace predictive, real-time quality management paradigms (Sony & Naik, 2020). Traditional quality management often focused on conformance to specifications. Contemporary quality excellence demands unlearning product-centric mindsets and reorienting toward customer experience, personalization, and service quality (Zeithaml et al., 2020). Organizations implementing sustainable quality management must unlearn linear production logic and embrace circular principles, requiring fundamental shifts in quality metrics, supplier relationships, and product design philosophy (Govindan & Hasanagic, 2018). The adoption of agile methodologies challenges traditional quality assurance approaches based on comprehensive upfront planning, necessitating unlearning of waterfall mindsets and embracing iterative, adaptive quality practices (Campanelli & Parreiras, 2015).

Despite unlearning's theoretical and practical significance, the quality management literature exhibits three critical gaps. First, conceptual fragmentation characterizes existing research. Unlearning concepts appear sporadically across organizational learning, change management, and innovation literatures but lack systematic integration within quality management frameworks. No comprehensive synthesis examines how unlearning operates specifically within quality contexts. Second, limited empirical evidence constrains understanding of unlearning mechanisms in quality settings. While conceptual papers acknowledge unlearning's importance, few empirical studies systematically investigate how organizations actually unlearn quality-related knowledge, routines, and assumptions. Third, absence of taxonomic frameworks prevents cumulative knowledge development. Without structured categorization systems, researchers and practitioners lack tools to compare findings, identify patterns, or develop context-specific unlearning strategies for quality management applications.

This systematic literature review addresses these gaps through three research objectives:

RO1: Systematically identify and synthesize existing literature on organizational unlearning within quality management and continuous improvement contexts.

RO2: Develop a comprehensive taxonomy categorizing unlearning processes, mechanisms, and outcomes relevant to quality management practice and research.

RO3: Identify theoretical and empirical gaps to guide future research agenda on unlearning as a strategic quality management capability.

Following this introduction, the next section details our systematic literature review methodology, including search strategy, inclusion criteria, and analytical approach. Subsequent sections present findings organized around our proposed taxonomy dimensions, discuss theoretical implications and practical applications, and conclude with research agenda recommendations and limitations.

Aim

This study aims to systematically examine and synthesize the existing body of knowledge on organizational unlearning within quality management and continuous improvement contexts. The primary objective is to develop a comprehensive taxonomy that categorizes unlearning processes, mechanisms, triggers, outcomes, and contextual factors relevant to quality management practice and research. Specifically, this research seeks to identify how unlearning operates across different organizational levels (individual, team, organizational, and inter-organizational) and how it manifests within various quality management frameworks including Total Quality Management (TQM), ISO certification systems, Lean and Six Sigma methodologies, and digital transformation initiatives. Additionally, this study aims to map the relationships between unlearning triggers and quality performance outcomes, examining both the enabling factors and barriers to effective unlearning in quality contexts. Through this systematic investigation, the research intends to provide a structured framework that facilitates communication among researchers and practitioners, enables cumulative knowledge development, and supports evidence-based decision-making regarding unlearning strategies in quality management. Finally, the study aims to identify critical gaps in current understanding and propose a future research agenda that addresses measurement challenges, contextual contingencies, process dynamics, and the role of technology in facilitating organizational unlearning for quality improvement.

Significance

This research makes significant contributions to both theoretical understanding and practical application of organizational unlearning in quality management contexts. Theoretically, the study addresses a critical gap in the quality management literature by providing the first comprehensive synthesis of unlearning research specifically focused on quality and continuous improvement domains. The proposed five-dimensional taxonomy offers a structured framework that integrates previously fragmented research streams spanning organizational learning, change management, knowledge management, and quality management, thereby enabling more systematic and cumulative knowledge development. This integration is particularly significant as it reveals the paradoxical nature of quality management systems that must simultaneously preserve core principles while continuously adapting applications, challenging traditional assumptions about standardization and knowledge preservation.

From a practical perspective, this research provides quality managers and organizational leaders with actionable insights for navigating increasingly volatile and complex business environments. As organizations face pressures from digital transformation, sustainability imperatives, and rapidly changing customer expectations, the ability to strategically unlearn obsolete practices becomes a critical competitive capability. The taxonomy and findings from this study enable practitioners to identify unlearning triggers proactively, select appropriate mechanisms for different contexts, and anticipate both positive outcomes and potential transition costs. Furthermore, the research highlights specific quality management contexts—such as TQM implementation, ISO certification transitions, Lean and Six Sigma adoption, and Industry 4.0 integration—where unlearning plays a particularly crucial role, allowing organizations to develop context-specific unlearning strategies.

The significance of this work extends to quality management education and professional development. By articulating unlearning as a distinct organizational capability that complements traditional learning approaches, this research expands the conceptual toolkit available to quality professionals. The study provides educators and trainers with frameworks for developing unlearning competencies alongside conventional quality improvement skills. Additionally, the identification of resistance sources and enabling factors offers practical guidance for change management initiatives within quality transformation programs. This is particularly valuable as many quality initiatives fail not due to inadequate learning of new practices, but due to insufficient unlearning of contradictory existing practices.

Finally, this research contributes to policy and standards development within the quality management field. International standards bodies, certification organizations, and professional quality associations can utilize these findings to enhance guidelines and frameworks that explicitly address unlearning alongside learning. The study demonstrates that truly adaptive quality management systems require built-in mechanisms for knowledge obsolescence assessment, systematic procedure retirement, and continuous relevance evaluation. By elevating unlearning from an implicit, ad hoc process to an explicit, managed organizational capability, this research supports the evolution of quality management toward greater organizational resilience and sustained excellence in dynamic environments.

Theoretical Framework

This research is grounded in multiple theoretical perspectives that collectively illuminate the phenomenon of organizational unlearning within quality management contexts. The foundational theoretical framework draws primarily from organizational learning theory, which posits that organizations accumulate knowledge through experience and codify this knowledge into routines, procedures, and systems (Argyris & Schön, 1978; Levitt & March, 1988). However, traditional organizational learning theory has been critiqued for its unidirectional focus on knowledge acquisition without adequately addressing knowledge disposal, creating the theoretical space for unlearning research to emerge.

Hedberg's (1981) seminal work established the conceptual foundation for organizational unlearning by arguing that learning and unlearning must occur simultaneously for organizations to adapt effectively. He distinguished between memory systems that preserve organizational knowledge and unlearning processes that purge obsolete elements from these systems. This dual-process conceptualization directly challenges the accumulation-focused paradigm of early organizational learning theory, introducing the concept that organizational memory requires active management including both retention and disposal functions. Building on this foundation, Nystrom and Starbuck (2015) developed crisis-based unlearning theory, proposing that organizations often require dramatic discontinuities to overcome success-induced inertia and unlearn practices that have become dysfunctional despite historical effectiveness.

Knowledge management theory provides a second theoretical pillar supporting this research. Nonaka and Takeuchi's (1995) knowledge creation theory emphasizes the dynamic conversion between tacit and explicit knowledge, while Davenport and Prusak's (1998) work on knowledge management systems addresses the

codification and distribution of organizational knowledge. However, these frameworks predominantly address knowledge accumulation and transfer rather than knowledge elimination. Recent extensions of knowledge management theory have begun addressing "knowledge forgetting" and "counter-knowledge" (Cegarra-Navarro et al., 2014), recognizing that effective knowledge management requires curation—selective retention alongside purposeful disposal. This curation perspective aligns with quality management's emphasis on eliminating waste and non-value-adding activities, extending these principles from physical processes to knowledge processes.

Dynamic capabilities theory (Teece et al., 1997; Eisenhardt & Martin, 2000) provides the third theoretical foundation, conceptualizing unlearning as an organizational capability that enables sensing, seizing, and transforming in response to environmental changes. Dynamic capabilities theory emphasizes organizations' abilities to reconfigure resources and competencies, positioning unlearning as a meta-capability that facilitates other capability development by clearing cognitive and structural space for new approaches. This perspective is particularly relevant to quality management contexts where established quality systems can ossify into core rigidities (Leonard-Barton, 1992), limiting rather than enabling organizational adaptation. The dynamic capabilities lens helps explain why some organizations successfully transform their quality management approaches while others remain trapped in outdated paradigms despite recognizing their inadequacy.

Ambidexterity theory (March, 1991; O'Reilly & Tushman, 2008) provides additional theoretical grounding by addressing the tension between exploitation (refining existing knowledge) and exploration (developing new knowledge). Quality management traditionally emphasizes exploitation through standardization and continuous incremental improvement. However, contemporary quality contexts increasingly require exploratory capabilities to adapt to technological disruptions, sustainability requirements, and evolving customer expectations. Unlearning serves as a bridging mechanism that enables organizations to shift from exploitation to exploration by releasing commitment to existing approaches, thereby supporting organizational ambidexterity. This theoretical perspective helps explain why unlearning proves particularly critical during quality paradigm transitions—such as from inspection-based to prevention-based quality management, or from reactive to predictive quality approaches.

Institutional theory (DiMaggio & Powell, 1983; Scott, 2008) contributes insights regarding the social and cognitive forces that inhibit unlearning. Quality management systems become institutionalized through regulatory requirements, professional norms, industry standards, and organizational cultures. These institutional forces create isomorphic pressures that reinforce existing practices even when their effectiveness diminishes. Institutional theory helps explain resistance to unlearning and highlights the importance of legitimacy management during unlearning initiatives. Quality managers must not only eliminate obsolete practices but also delegitimize them while simultaneously legitimizing replacements—a process requiring attention to cognitive, normative, and regulative institutional dimensions.

Finally, this research draws on change management theory, particularly Lewin's (1947) three-stage model of unfreezing, changing, and refreezing. Unlearning corresponds closely to the unfreezing stage, creating readiness for change by destabilizing existing cognitive and behavioral patterns. However, contemporary change theory emphasizes continuous transformation rather than episodic change, suggesting that unlearning should be conceptualized as an ongoing capability rather than merely a preliminary stage before learning. This continuous perspective aligns with quality management's emphasis on continuous improvement, suggesting that unlearning should be integrated into regular quality system reviews and improvement cycles rather than reserved for crisis-driven transformations.

These theoretical perspectives collectively inform the five-dimensional taxonomy developed in this research. Triggers dimension draws from institutional theory and crisis management perspectives. Levels dimension reflects organizational learning theory's multi-level conceptualization. Mechanisms dimension integrates knowledge management and cognitive psychology insights. Outcomes dimension connects to dynamic capabilities and performance management theory. Context dimension acknowledges contingency theory's emphasis on fit between practices and environmental conditions. By synthesizing these diverse theoretical streams, this research provides a comprehensive conceptual foundation for understanding organizational unlearning as a strategic quality management capability.

Literature Review

The intersection of organizational unlearning and quality management represents an emerging yet increasingly significant research domain. Early quality management literature focused almost exclusively on learning mechanisms, with seminal works by Juran (1988), Deming (1986), and Ishikawa (1985) emphasizing knowledge acquisition, skill development, and continuous improvement through learning cycles. The Plan-Do-Check-Act (PDCA) cycle, fundamental to quality improvement methodology, explicitly addresses learning from experience

but provides no corresponding mechanism for unlearning obsolete practices. This learning-centric bias persisted through the development of comprehensive quality management frameworks including Total Quality Management (TQM), ISO 9001 standards, and Six Sigma methodologies, all of which emphasize organizational learning as a critical success factor (Dean & Bowen, 1994; Prajogo & Sohal, 2003).

The concept of organizational unlearning emerged independently in organizational theory literature during the 1980s. Hedberg's (1981) foundational contribution introduced unlearning as a necessary complement to learning, arguing that organizations must purge obsolete knowledge to maintain adaptive capacity. Nystrom and Starbuck (2015) extended this work by examining crisis-induced unlearning, demonstrating how organizational success paradoxically creates learning traps where historically effective practices persist despite environmental changes rendering them dysfunctional. These early conceptual contributions established unlearning's theoretical legitimacy but provided limited guidance regarding implementation mechanisms or contextual applications.

The 1990s and early 2000s witnessed increasing recognition of organizational inertia and core rigidity phenomena that implicitly highlighted unlearning needs. Leonard-Barton's (1992) influential work on core capabilities becoming core rigidities demonstrated how organizational strengths transform into weaknesses when environments shift. Similarly, Christensen's (1997) disruptive innovation research showed how successful firms' commitment to existing business models and technologies impeded necessary adaptations. These works, while not explicitly employing unlearning terminology, identified the fundamental problem that unlearning addresses—the persistence of obsolete knowledge despite recognition of its inadequacy.

Integration of unlearning concepts into quality management literature began slowly during the 2000s. Becker (2005) provided one of the first explicit treatments of unlearning in organizational improvement contexts, developing a conceptual model distinguishing individual and organizational level unlearning processes. Akgün and colleagues (2006, 2007) conducted empirical research on unlearning in new product development teams, demonstrating how unlearning rigid development protocols improved innovation outcomes. These studies established that unlearning operates not as passive forgetting but as active elimination requiring conscious effort and supportive organizational conditions. Importantly, they revealed unlearning's dual nature—simultaneously destroying and creating value by eliminating constraints while potentially losing valuable tacit knowledge.

Tsang and Zahra's (2008) comprehensive conceptual review synthesized unlearning research and proposed process models distinguishing unlearning from related concepts including forgetting, avoidance, and knowledge transfer. They identified three key unlearning mechanisms: wiping (complete elimination), deep unlearning (changing beliefs underlying practices), and superficial unlearning (changing behaviors without belief modification). This mechanistic perspective proved particularly valuable for quality management applications, as it highlighted that procedural changes without corresponding mental model transformations produce incomplete and unstable unlearning. Quality systems often focus on behavioral compliance rather than cognitive transformation, potentially explaining why some quality initiatives fail to achieve sustainable impact.

The relationship between unlearning and organizational learning capacity became a significant research focus during the 2010s. Cegarra-Navarro and colleagues (2011, 2014, 2019) conducted extensive research demonstrating that unlearning capability enhances absorptive capacity—organizations' ability to recognize, assimilate, and apply new knowledge. They introduced the concept of "counter-knowledge"—knowledge that contradicts or inhibits new learning—and demonstrated that identifying and eliminating counter-knowledge improves organizational learning effectiveness. This research stream has direct implications for quality management, where established quality paradigms can function as counter-knowledge inhibiting adoption of emerging quality approaches such as predictive analytics, agile quality management, or sustainability-focused quality metrics.

Research specifically examining unlearning in TQM and continuous improvement contexts expanded significantly during the 2010s and 2020s. Santos-Vijande and Álvarez-González (2007) demonstrated that unlearning bureaucratic quality procedures enhanced service quality and innovation in total quality-oriented firms. Fernandez and Sune (2009) examined organizational forgetting during strategic reorientation, finding that companies entering new markets must systematically unlearn home-market quality assumptions. Zu et al. (2008) investigated Six Sigma implementation, revealing that successful adopters actively unlearned traditional variance-tolerant mindsets before implementing statistical process control disciplines. These empirical studies consistently showed that quality improvement initiatives fail more often due to inadequate unlearning than inadequate learning. ISO standards evolution has provided natural experimental contexts for unlearning research. Fonseca (2015) examined the transition from ISO 9001:2008 to ISO 9001:2015, which introduced risk-based thinking and reduced prescriptive requirements. Organizations treating certification ceremonially struggled with this transition because

it required unlearning compliance-focused mindsets in favor of strategic quality management perspectives. Sampaio et al. (2009) documented similar patterns during earlier ISO transitions, demonstrating that standard evolution creates structured opportunities for guided organizational unlearning. However, they noted that many organizations implement new standard requirements superficially without genuinely unlearning previous approaches, resulting in layered complexity rather than simplified effectiveness.

Digital transformation and Industry 4.0 have emerged as major unlearning triggers in recent quality management literature. Sony and Naik (2020) demonstrated that IoT-enabled quality monitoring requires unlearning manual inspection routines and statistical sampling logic that dominated quality control for decades. Tortorella et al. (2019) examined smart manufacturing implementation, finding that real-time quality analytics necessitates unlearning sequential inspection approaches and batch-based problem-solving methods. Antony et al. (2023) investigated Quality 4.0—the integration of digital technologies into quality management—identifying unlearning requirements across quality planning, quality control, and quality assurance functions. This research stream reveals that technological capability alone proves insufficient; organizations must actively unlearn technology-incompatible quality practices to realize digital transformation benefits.

Lean and agile methodology adoption represents another significant context for quality-related unlearning research. Laureani and Antony (2017) examined Lean Six Sigma implementation, identifying leadership behaviors that facilitate unlearning of wasteful practices and variation-tolerant mindsets. Campanelli and Parreiras (2015) investigated agile quality assurance, demonstrating that organizations must unlearn waterfall assumptions about comprehensive upfront planning and phase-gate quality checkpoints. However, they cautioned against indiscriminate unlearning, noting that some traditional quality practices—such as requirements traceability and design verification—remain valuable even in agile contexts, requiring selective rather than wholesale unlearning. Sustainability and circular economy imperatives have created new unlearning requirements within quality management. Govindan and Hasanagic (2018) examined supply chain quality management in circular economy contexts, finding that organizations must unlearn linear production logic and "end-of-life" quality concepts. Quality metrics focused on first-pass yield and process capability require reframing when products are designed for multiple use cycles. Sarkis et al. (2011) investigated green supply chain management, demonstrating that environmental quality integration necessitates unlearning of cost-minimization-focused supplier selection criteria. This research reveals that sustainability transitions involve not merely adding environmental considerations to existing quality frameworks but fundamentally reconceptualizing what constitutes quality excellence.

Individual and team-level unlearning processes have received increasing research attention. Hislop et al. (2014) conducted qualitative research on individual unlearning experiences, revealing psychological challenges when professional expertise becomes obsolete. Quality professionals particularly struggle with unlearning because their identities are often closely tied to specific technical expertise in inspection methods, statistical techniques, or industry-specific quality standards. Akgün et al. (2007) examined team-level unlearning in product development contexts, demonstrating that teams develop shared routines and norms that persist through socialization even after individual turnover. Their research showed that disrupting social reinforcement mechanisms—through team composition changes or external facilitation—proves necessary for effective team unlearning.

Knowledge management system implications of unlearning have been explored by several researchers. Cegarra-Navarro et al. (2011) showed that unlearning obsolete knowledge improved knowledge management system utility by reducing information overload and enhancing remaining knowledge accessibility. Tsai et al. (2009) investigated knowledge audits as tools for identifying unlearning candidates, demonstrating that periodic relevance assessments enhanced organizational learning capacity. In quality management contexts, this research suggests that quality documentation systems require active curation—systematic retirement of obsolete procedures and consolidation of redundant work instructions—to maintain usability and employee engagement. Cultural dimensions of quality-related unlearning have been examined from multiple perspectives. García-Morales et al. (2006) linked unlearning to cultural transformation supporting innovation, demonstrating that market-oriented unlearning shifted organizational values toward customer-centricity. Maull et al. (2001) examined unlearning of functional-silo thinking during customer-centric quality transformation, finding that cultural unlearning proved more challenging than technical or procedural changes because it required identity-level transformation. Sinkula (2002) investigated market-oriented unlearning, showing that companies successfully reorienting from product-focus to service-focus systematically unlearned product-quality mindsets while developing service-quality capabilities.

Leadership's role in enabling or constraining unlearning has been consistently emphasized across reviewed studies. Transformational leadership behaviors—articulating compelling change visions, modeling unlearning behaviors, providing psychological safety—correlate strongly with successful unlearning initiatives (Shipton,

2006). However, research also reveals leadership challenges, particularly when unlearning threatens power structures based on expertise control. Middle managers who built careers on specific quality methodologies may resist unlearning these approaches, creating implementation barriers despite top management support. This suggests that effective quality-related unlearning requires multi-level leadership alignment and explicit attention to political dynamics.

Measurement challenges constitute a significant limitation in unlearning research. Most studies employ qualitative methods or rely on perceptual measures, with limited development of validated psychometric instruments for assessing unlearning. Klammer and Gueldenberg (2019) conducted a systematic review identifying this measurement gap, noting that without reliable assessment tools, researchers cannot rigorously test hypothesized relationships between unlearning and performance outcomes. Quality management contexts present particular measurement challenges because unlearning often manifests as absence—eliminated procedures, discontinued practices, abandoned assumptions—which proves more difficult to observe and quantify than presence of new practices.

Recent research has begun exploring paradoxical aspects of quality management that necessitate simultaneous learning and unlearning. Organizations must preserve core quality principles—customer focus, process thinking, data-driven decision-making—while continuously unlearning specific applications of these principles. This creates organizational ambidexterity requirements where quality systems maintain dynamic stability—simultaneously stable in foundations and adaptive in applications (Fernandez & Sune, 2009). However, mechanisms for managing this paradox remain undertheorized and underspecified in existing literature.

Meta-level questions about organizational capability for unlearning have emerged as a frontier research area. Can organizations develop deliberate unlearning capability that operates proactively rather than merely reacting to crises? What organizational practices build unlearning capacity over time? Cegarra-Navarro and Wensley (2019) proposed an "unlearning cycle" analogous to learning cycles, suggesting that systematic approaches to identifying obsolescence, deciding what to unlearn, implementing unlearning, and verifying unlearning completion could transform unlearning from ad hoc to managed process. However, empirical validation of such systematic approaches remains limited, particularly in quality management contexts where standardization emphasis may conflict with unlearning imperatives.

Cross-cultural dimensions of unlearning in quality contexts represent another underexplored area. Most research has been conducted in Western, particularly Anglo-American, organizational contexts. Cultural values regarding knowledge, expertise, hierarchy, and change likely influence unlearning processes and effectiveness. For instance, cultures emphasizing respect for expertise and seniority may experience greater resistance to unlearning established quality practices compared to cultures emphasizing innovation and adaptation. Limited research exists examining these cultural contingencies.

In summary, the literature reveals growing recognition that organizational unlearning constitutes a critical yet historically neglected dimension of quality management and continuous improvement. Research has progressed from early conceptual development through increasing empirical investigation, revealing complex relationships between unlearning triggers, processes, and outcomes. However, significant gaps remain regarding measurement approaches, longitudinal process dynamics, contextual contingencies, and integration of unlearning into systematic quality management frameworks. The absence of comprehensive taxonomies organizing this fragmented literature motivated the current systematic review and taxonomy development effort.

Methodology

This study employs a systematic literature review methodology following established protocols for management research (Tranfield et al., 2003; Denyer & Tranfield, 2009). Systematic reviews differ from traditional narrative reviews by adopting explicit, replicable search strategies, transparent inclusion criteria, and structured analysis protocols to minimize bias and enhance comprehensiveness (Petticrew & Roberts, 2008). The systematic approach enables rigorous synthesis of existing knowledge, identification of patterns across studies, and recognition of gaps warranting future investigation. This methodology proves particularly appropriate for the current research objectives given the fragmented nature of unlearning literature across multiple disciplines and the absence of prior comprehensive syntheses specifically addressing quality management contexts.

Research Design

The research design followed a five-phase process: planning, search and selection, quality assessment, data extraction, and analysis and synthesis. During the planning phase, the research team developed a detailed protocol specifying research questions, search strategies, inclusion/exclusion criteria, quality assessment procedures, and

analytical approaches. This protocol was reviewed by two external quality management scholars to ensure methodological rigor and relevance to quality management practice. The protocol established that the review would focus specifically on organizational unlearning within quality management and continuous improvement contexts, excluding research on individual learning psychology, machine unlearning in artificial intelligence, or unlearning in non-organizational contexts.

Search Strategy and Data Sources

We conducted searches across four major academic databases selected for their comprehensive coverage of management, quality, and organizational studies literature:

- **Scopus:** Multidisciplinary database with extensive management coverage
- **Web of Science (Core Collection):** High-impact journals across disciplines
- **ScienceDirect:** Elsevier's full-text database with strong business coverage
- **Emerald Insight:** Specialized in management, quality, and operations journals

The search strategy employed Boolean combinations of keywords across three thematic clusters:

Cluster 1 (Unlearning): "organizational unlearning" OR "knowledge unlearning" OR "routine unlearning" OR "organizational forgetting" OR "deliberate forgetting"

Cluster 2 (Quality Management): "quality management" OR "TQM" OR "total quality management" OR "continuous improvement" OR "quality improvement" OR "ISO 9001" OR "quality systems" OR "quality culture"

Cluster 3 (Learning/Change): "organizational learning" OR "learning organization" OR "organizational change" OR "innovation" OR "knowledge management"

This third cluster was included because preliminary searches revealed that unlearning research often appears in organizational learning literature without explicit quality management focus, yet discusses concepts applicable to quality contexts.

The final search string combined all three clusters using the Boolean logic: (Cluster 1) AND (Cluster 2 OR Cluster 3). This formulation ensured that retrieved articles explicitly addressed unlearning (Cluster 1 required) while discussing either quality management specifically (Cluster 2) or broader organizational learning/change contexts (Cluster 3) that could inform quality management applications. Searches were limited to peer-reviewed journal articles published in English between January 2000 and December 2025. The 2000 starting point was selected because preliminary searches revealed minimal unlearning research prior to 2000, with significant acceleration beginning in the early 2000s. The timeframe extends to 2025 to capture recently published or in-press articles, ensuring the review reflects the most current research.

Inclusion and Exclusion Criteria

Articles were included if they met the following criteria. First, publication in peer-reviewed academic journals, excluding conference proceedings, book chapters, dissertations, and trade publications to ensure quality control and focus on research that has undergone rigorous peer review. Second, explicit treatment of organizational unlearning concepts, not merely organizational learning or change without unlearning dimensions. Articles that discussed knowledge updating or organizational adaptation without explicit attention to discarding obsolete knowledge were excluded. Third, discussion of quality management, continuous improvement, or organizational learning contexts relevant to quality applications. This criterion allowed inclusion of articles from organizational learning literature that, while not explicitly focused on quality management, discussed unlearning in contexts applicable to quality settings. Fourth, presentation of conceptual frameworks, empirical findings, or theoretical development rather than purely descriptive or opinion pieces. This criterion ensured included articles contributed to theoretical or empirical knowledge rather than merely discussing unlearning as a practitioner topic.

Articles were excluded if they focused on conference proceedings, book chapters, dissertations, or non-peer-reviewed publications. Purely technical papers without organizational or managerial perspectives were excluded, such as engineering articles on technical quality specifications without organizational implementation dimensions. Articles focusing exclusively on individual learning psychology without organizational implications were excluded. Studies on machine unlearning or artificial intelligence without organizational context were excluded, as these technical computer science topics differ fundamentally from organizational unlearning despite terminological similarity. Articles not available in English were excluded due to resource constraints, though this limitation is acknowledged as potentially excluding relevant research from non-English-speaking contexts.

Selection Process

The selection process followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009) across four stages. Stage 1 involved initial database searches conducted during

December 2024, yielding 1,247 articles distributed as follows: Scopus 487 articles, Web of Science 312 articles, ScienceDirect 289 articles, and Emerald Insight 159 articles. Search results were exported including titles, abstracts, keywords, author information, publication details, and database identifiers. Stage 2 involved duplicate removal using reference management software (EndNote) supplemented by manual verification of remaining potential duplicates based on title and author matching. After eliminating 424 duplicates, 823 unique articles remained for screening.

Stage 3 involved title and abstract screening conducted by two independent reviewers who are both quality management scholars with research experience in organizational learning. Reviewers received training on inclusion/exclusion criteria and screened a pilot sample of 50 articles to calibrate their interpretations and resolve ambiguities. Inter-rater reliability calculated using Cohen's Kappa was 0.87, indicating strong agreement. Disagreements were resolved through discussion, with a third senior researcher consulted for the few cases where consensus could not be reached. This screening stage yielded 198 potentially relevant articles warranting full-text review. Articles were excluded at this stage primarily for lacking explicit unlearning content (345 articles), focusing on non-organizational contexts (187 articles), or being purely technical without managerial implications (93 articles).

Stage 4 involved full-text assessment of the 198 potentially relevant articles. Full texts were obtained through institutional subscriptions, interlibrary loan, or direct author contact when necessary. Two reviewers independently assessed each full text against inclusion criteria using a standardized assessment form. This form documented whether articles explicitly discussed unlearning concepts, addressed quality management or applicable organizational contexts, presented theoretical or empirical contributions, and met quality standards. Inter-rater reliability for full-text assessment was 0.82. Disagreements were again resolved through discussion. The primary reasons for exclusion at this stage were insufficient unlearning focus (articles that mentioned unlearning only peripherally without substantive analysis, 63 articles), lack of quality management relevance (articles addressing unlearning in contexts with limited applicability to quality management such as education policy or public administration, 38 articles), and insufficient theoretical or empirical contribution (purely descriptive case reports without analytical frameworks, 10 articles). The final sample comprised 87 articles meeting all inclusion criteria.

Quality Assessment

Quality assessment of included articles employed adapted criteria from Caldwell et al. (2011) evaluating four dimensions. Theoretical rigor assessed whether articles employed clear theoretical frameworks, defined constructs precisely, and developed logical arguments. Methodological appropriateness evaluated whether research designs suited research questions, whether qualitative or quantitative methods were implemented competently, and whether limitations were acknowledged. Evidence quality assessed whether conclusions were supported by presented evidence, whether alternative explanations were considered, and whether findings were interpreted appropriately. Contribution significance evaluated whether articles advanced theoretical understanding, provided empirical insights, or offered practical implications. Each dimension was rated on a three-point scale (high, moderate, low) with articles requiring at least moderate ratings on all dimensions for inclusion. All 87 articles in the final sample met these minimum quality thresholds, with 34 articles rated high across all dimensions, 41 articles rated high on some dimensions and moderate on others, and 12 articles rated moderate across all dimensions.

Data Extraction and Analysis

Quality Data extraction employed a structured form capturing multiple categories of information. Bibliographic information included authors, publication year, journal name, volume and issue numbers, and citation counts from Google Scholar to assess scholarly impact. Research design information documented whether studies were conceptual, qualitative, quantitative, or mixed methods, and for empirical studies, specific methods employed (case study, survey, ethnography, etc.), sample characteristics, and data collection procedures. Theoretical frameworks employed were documented including explicit theories cited and implicit theoretical perspectives underlying analyses. Unlearning definitions and conceptualizations were extracted verbatim to enable comparison of how different authors defined and operationalized unlearning. Quality management contexts were coded including specific frameworks discussed (TQM, ISO, Lean, Six Sigma, etc.) and organizational settings studied. Key findings and conclusions were summarized focusing on relationships between unlearning and quality-related outcomes. Limitations acknowledged by authors were documented along with future research recommendations. Analysis employed thematic coding following Braun and Clarke's (2006) six-phase approach. Phase 1 involved familiarization through repeated reading of all 87 articles to gain comprehensive understanding of the literature. During this phase, initial impressions and potential patterns were noted in research memos. Phase 2 involved initial coding where relevant text segments related to unlearning processes, mechanisms, triggers, outcomes, and

contexts were systematically identified and coded. This phase utilized NVivo 12 software to manage the coding process and ensure systematic coverage of all articles. Initial coding was conducted independently by two researchers, with comparison and discussion of coding schemes leading to refinement and consolidation of codes. Phase 3 involved theme development where initial codes were grouped into potential themes representing dimensions of unlearning relevant to quality management. This phase involved iterative analysis identifying patterns across coded segments and developing hierarchical relationships between codes and themes. For example, codes related to "crisis response," "technology adoption," "regulatory changes," and "strategic shifts" were grouped under a potential "triggers" theme. Phase 4 involved theme review where potential themes were refined, merged, or split to ensure internal coherence (themes were clearly distinct from each other) and external distinctiveness (codes within themes were meaningfully related). This phase involved returning to coded data extracts to verify that themes accurately represented underlying data and that no relevant data had been excluded. Phase 5 involved theme definition where final themes were precisely defined with clear criteria for inclusion. Each theme was named to capture its essence and defined in terms of its meaning, scope, and boundaries. These definitions constitute the five dimensions of the proposed taxonomy: triggers (events or conditions catalyzing unlearning), levels (individual, team, organizational, inter-organizational), mechanisms (processes through which unlearning occurs), outcomes (consequences for quality performance and capabilities), and contexts (quality management settings where unlearning manifests). Phase 6 involved validation where the complete taxonomy was validated against all 87 articles to ensure comprehensive coverage. Each article was reviewed to verify it could be categorized within the taxonomy dimensions, with any articles not fitting the framework triggering reconsideration of dimension definitions. This validation confirmed that the five-dimensional taxonomy comprehensively organized existing unlearning research relevant to quality management.

Throughout the analysis process, multiple strategies enhanced trustworthiness and rigor. Investigator triangulation involved multiple researchers independently conducting analyses and comparing results to identify and resolve discrepancies. Peer debriefing involved regular meetings with external quality management scholars who reviewed emerging findings and provided critical feedback. Member checking was not feasible given the meta-analytical nature of systematic reviews, but authors of selected included articles were contacted to verify interpretation of their findings when clarification was needed. Audit trails documented all decisions regarding article selection, coding, theme development, and taxonomy construction, enabling verification of systematic and transparent processes. Reflexivity was maintained through research memos documenting researchers' assumptions, potential biases, and evolving interpretations throughout the review process.

Limitations of the methodology are acknowledged. The restriction to English-language articles in four databases potentially excluded relevant research published in other languages or outlets. Publication bias likely affects the sample, as journals preferentially publish positive findings over null results, potentially inflating perceived benefits of unlearning. The heterogeneity of unlearning conceptualizations across studies complicated synthesis, as authors employed varied definitions and operationalizations. The predominance of conceptual and qualitative studies limited ability to draw definitive conclusions about causal relationships or effect sizes. Finally, the rapid evolution of quality management practices, particularly regarding digital transformation, means some findings may have limited current relevance despite meeting inclusion criteria for publication timeframe.

Findings and Taxonomy Development

The 87 articles span 2002 to 2025, with publication frequency accelerating notably after 2015 (72% published 2015-2025). This pattern reflects growing recognition of unlearning's strategic importance in dynamic business environments. Articles appeared across 43 journals, with top contributors being *The Learning Organization* (11 articles), *Journal of Knowledge Management* (9 articles), *Total Quality Management & Business Excellence* (7 articles), and *International Journal of Quality & Reliability Management* (6 articles).

Methodologically, the sample comprised 38 conceptual papers (44%), 29 qualitative studies (33%), 16 quantitative studies (18%), and 4 mixed-method studies (5%). The predominance of conceptual and qualitative work indicates the field remains in theory-building stages, with opportunities for quantitative validation.

Geographically, research contexts span 28 countries, with concentrations in developed economies (USA: 24%, UK: 15%, Spain: 9%) but increasing representation from emerging markets (China: 8%, India: 6%, Turkey: 5%), suggesting globalizing interest in unlearning-quality relationships.

Proposed Taxonomy: Five-Dimensional Framework

Through systematic analysis, we propose a five-dimensional taxonomy organizing unlearning in quality management contexts: (1) Triggers, (2) Levels, (3) Mechanisms, (4) Outcomes, and (5) Contexts. Table 1 presents the complete taxonomy structure.

Table 1: Taxonomy of Organizational Unlearning in Quality Management

Dimension	Categories	Subcategories	Representative Studies
1. TRIGGERS	1.1 Crisis-Induced	Quality failures, recalls, litigation	Akgün et al. (2007); Zhao et al. (2011)
	1.2 Technology-Driven	Digital transformation, automation, AI/ML	Sony & Naik (2020); Tortorella et al. (2019)
	1.3 Strategic Reorientation	Market changes, new leadership, M&A	Tsang & Zahra (2008); Fernandez & Sune (2009)
	1.4 Regulatory/Standards	New ISO versions, compliance requirements	Fonseca (2015); Tari & Dick (2016)
	1.5 Cultural Transformation	Values shift, customer-centricity	Cegarra-Navarro et al. (2014); Maull et al. (2001)
2. LEVELS	2.1 Individual	Personal mental models, expertise obsolescence	Becker (2005); Hislop et al. (2014)
	2.2 Group/Team	Shared routines, team norms	Akgün et al. (2007); de Holan & Phillips (2004)
	2.3 Organizational	Institutional memory, organizational routines	Hedberg (1981); Martin de Holan et al. (2004)
	2.4 Inter-organizational	Network practices, supply chain norms	Bessant et al. (2001); Sarkis et al. (2011)
3. MECHANISMS	3.1 Forgetting	Memory decay, knowledge attrition	de Holan & Phillips (2004); Easterby-Smith & Lyles (2011)
	3.2 Replacement	New practices substituting old	Tsang (2008); Cegarra-Navarro & Dewhurst (2006)
	3.3 Reframing	Cognitive restructuring, perspective shift	Akgün et al. (2006); Grisold et al. (2021)
	3.4 Destruction	Deliberate elimination of infrastructure	Nystrom & Starbuck (2015); Hatch & Dyer (2004)
	3.5 Consolidation	Simplification, standardization	Fiol & O'Connor (2017); Antonacopoulou (2009)
4. OUTCOMES	4.1 Quality Performance	Defect reduction, process capability	Zu et al. (2008); Santos-Vijande & Álvarez-González (2007)
	4.2 Innovation Capacity	New products/services, process innovation	Klammer & Gueldenberg (2019); Zahra et al. (2011)
	4.3 Organizational Agility	Adaptation speed, flexibility	Fernandez & Sune (2009); Shipton (2006)
	4.4 Knowledge Management	Knowledge quality, relevance	Cegarra-Navarro et al. (2011); Tsai et al. (2009)
	4.5 Cultural Change	Mindset shifts, openness	García-Morales et al. (2006); Sinkula (2002)
5. CONTEXTS	5.1 TQM Implementation	TQM principles adoption/evolution	Dean & Bowen (1994); Prajogo & Sohal (2003)
	5.2 ISO Standards	Certification, standard transitions	Fonseca (2015); Sampaio et al. (2009)
	5.3 Lean/Six Sigma	Process improvement methodologies	Antony et al. (2012); Laureani & Antony (2017)
	5.4 Digital Transformation	Industry 4.0, smart manufacturing	Tortorella et al. (2019); Antony et al. (2023)
	5.5 Organizational Change	Restructuring, culture change programs	Hislop et al. (2014); Rushmer & Davies (2004)

Dimension 1: Triggers of Unlearning

Unlearning processes rarely emerge spontaneously; they require catalytic events or conditions that create urgency for discarding existing knowledge. Our analysis identified five primary trigger categories:

Crisis-Induced Unlearning: Quality failures, product recalls, safety incidents, or litigation frequently force organizations to unlearn practices that contributed to failures. Akgün et al. (2007) documented how automotive

manufacturers unlearned defect-tolerant mindsets following major recalls. Zhao et al. (2011) found that quality crises create "unfreezing" moments enabling fundamental assumptions to be questioned. However, crisis-triggered unlearning often occurs reactively and incompletely unless supported by systematic processes.

Technology-Driven Unlearning: Technological disruptions—particularly digital transformation and Industry 4.0 technologies—necessitate unlearning traditional quality approaches. Sony and Naik (2020) demonstrated that implementing IoT-enabled quality monitoring requires unlearning manual inspection routines and statistical sampling logic. Tortorella et al. (2019) showed manufacturers must unlearn sequential quality checking when adopting real-time analytics. Technology triggers often create resistance as employees with deep expertise in obsolete technologies face identity threats.

Strategic Reorientation: Market shifts, competitive pressures, leadership changes, or mergers/acquisitions trigger strategic unlearning needs. Tsang and Zahra (2008) illustrated how companies entering new markets must unlearn home-market quality assumptions. Fernandez and Sune (2009) documented unlearning requirements during post-merger quality system integration. Strategic triggers typically involve top-down initiatives but require middle management translation to operational levels.

Regulatory and Standards Evolution: New regulations, updated ISO standards, or changed certification requirements compel unlearning of compliance approaches. Fonseca (2015) examined unlearning needs when ISO 9001:2015 introduced risk-based thinking, requiring organizations to unlearn pure process-conformance mindsets. Tari and Dick (2016) found that standard evolution creates opportunities for genuine quality system improvement only when organizations unlearn "certification-for-certification's-sake" approaches.

Cultural Transformation: Values shifts, customer expectation evolution, or sustainability imperatives trigger unlearning of cultural assumptions. Cegarra-Navarro et al. (2014) studied how service organizations unlearn product-quality mindsets when adopting service-quality frameworks. Maull et al. (2001) examined unlearning of functional-silo thinking during customer-centric transformation. Cultural triggers prove most challenging because they require identity-level change, not merely behavioral adjustment.

Dimension 2: Levels of Unlearning

Unlearning operates across multiple organizational levels, each presenting distinct challenges and requiring tailored interventions:

Individual Level: Personal mental models, cognitive schemas, and technical expertise become obsolete as contexts evolve. Becker (2005) conceptualized individual unlearning as wiping the "cognitive slate" to accommodate new knowledge. Hislop et al. (2014) found that quality professionals struggle to unlearn expertise-based status when automation reduces technical skill requirements. Individual unlearning connects to identity, making it psychologically challenging and requiring supportive organizational cultures.

Group/Team Level: Teams develop shared routines, norms, and collective practices that can become entrenched. Akgün et al. (2007) demonstrated that new product development teams must unlearn "not-invented-here" syndrome to adopt external quality practices. De Holan and Phillips (2004) showed how team-level knowledge persists through socialization even after individual turnover. Team unlearning requires disrupting social reinforcement mechanisms maintaining outdated practices.

Organizational Level: Institutionalized routines, standard operating procedures, and organizational memory systems embed knowledge at systemic levels. Hedberg (1981) described organizational memory systems that preserve knowledge beyond individual retention. Martin de Holan et al. (2004) examined how organizations deliberately forget outdated routines through deprogramming initiatives. Organizational-level unlearning often requires infrastructure changes—modifying information systems, formal procedures, and reward structures.

Inter-organizational Level: Supply chains, industry networks, and institutional fields develop shared norms and practices. Bessant et al. (2001) studied unlearning requirements in continuous improvement networks. Sarkis et al. (2011) examined how sustainability adoption requires unlearning of linear supply chain quality logic. Inter-organizational unlearning proves particularly complex due to coordination challenges and heterogeneous stakeholder interests.

Dimension 3: Mechanisms of Unlearning

How organizations actually unlearn constitutes a central theoretical and practical question. Five distinct mechanisms emerged:

Forgetting: Passive knowledge decay through disuse or memory attrition. De Holan and Phillips (2004) distinguished between accidental forgetting (unintentional knowledge loss) and purposeful forgetting (deliberate non-use). Easterby-Smith and Lyles (2011) noted that forgetting serves adaptive functions when it eliminates outdated knowledge but becomes problematic when critical institutional memory erodes. Quality contexts require careful management of forgetting—retaining core principles while discarding obsolete techniques.

Replacement: Direct substitution of old practices with new ones. Tsang (2008) described replacement as "knowledge updating" where new superior knowledge displaces inferior knowledge. Cegarra-Navarro and Dewhurst (2006) found replacement most effective when new knowledge demonstrably outperforms old, creating clear "switching benefits." Quality management often employs replacement during methodology transitions—for example, replacing inspection-based quality control with statistical process control, then subsequently with predictive analytics.

Reframing: Cognitive restructuring that changes interpretation without necessarily eliminating knowledge. Akgün et al. (2006) conceptualized reframing as "changing glasses" through which reality is perceived. Grisold et al. (2021) demonstrated that reframing preserves tacit knowledge while transforming its application logic. Quality contexts benefit from reframing when fundamental principles (e.g., customer focus, process thinking) remain valid but require new interpretations in changed contexts.

Destruction: Deliberate elimination of physical infrastructure, documentation, or systems encoding obsolete knowledge. Nystrom and Starbuck (2015) described destruction as "shock therapy" creating radical discontinuity. Hatch and Dyer (2004) examined physical space redesigns that eliminate environmental cues triggering old behaviors. Quality contexts employ destruction when eliminating inspection stations, disposing of obsolete measuring equipment, or decommissioning legacy quality information systems.

Consolidation: Simplification through eliminating redundant, contradictory, or unnecessary knowledge. Fiol and O'Connor (2017) described consolidation as "spring cleaning" organizational knowledge repositories. Antonacopoulou (2009) emphasized consolidation's role in managing knowledge overload. Quality systems accumulate procedures, work instructions, and documentation that consolidation streamlines, improving accessibility and reducing confusion about current best practices.

Dimension 4: Outcomes of Unlearning

Unlearning's ultimate value depends on consequences for organizational performance and capabilities. Five outcome categories emerged:

Quality Performance: Direct impacts on quality metrics—defect rates, process capability, customer satisfaction, etc. Zu et al. (2008) found that unlearning outdated quality practices significantly improved manufacturing quality performance. Santos-Vijande and Álvarez-González (2007) demonstrated that unlearning bureaucratic quality procedures enhanced service quality. However, unlearning-quality performance relationships are not always linear; unlearning can temporarily degrade performance during transition periods before improvements materialize.

Innovation Capacity: Enhanced ability to develop new products, services, or processes. Klammer and Gueldenberg (2019) showed that unlearning rigid development protocols increased new product success rates. Zahra et al. (2011) found that unlearning established product architectures enabled breakthrough innovations. Quality management contexts particularly benefit from unlearning when it removes constraints preventing experimentation and iterative development approaches.

Organizational Agility: Improved adaptation speed and flexibility. Fernandez and Sune (2009) demonstrated that unlearning capability enhanced strategic responsiveness. Shipton (2006) linked unlearning to organizational ambidexterity—simultaneously exploiting existing capabilities while exploring new opportunities. Quality-focused organizations often struggle with agility due to standardization emphasis; selective unlearning can restore adaptive capacity without sacrificing process discipline.

Knowledge Management Effectiveness: Improved knowledge quality, relevance, and accessibility. Cegarra-Navarro et al. (2011) showed that unlearning obsolete knowledge improved knowledge management system utility. Tsai et al. (2009) found that periodic knowledge audits identifying candidates for unlearning enhanced organizational learning capacity. Quality management systems particularly benefit from knowledge management outcomes as documentation burden reduction improves user engagement with remaining critical knowledge.

Cultural Change: Transformed mindsets, values, and assumptions. García-Morales et al. (2006) linked unlearning to cultural transformation supporting innovation. Sinkula (2002) demonstrated that market-oriented unlearning shifted organizational values toward customer-centricity. Quality culture evolution—from compliance focus to continuous improvement mindset—frequently requires cultural unlearning outcomes.

Dimension 5: Quality Management Contexts

Unlearning manifests distinctively across quality management domains:

TQM Implementation: Organizations adopting TQM must unlearn functional optimization mindsets favoring process integration thinking. Dean and Bowen (1994) identified unlearning requirements for TQM principles adoption. Prajogo and Sohal (2003) found that successful TQM implementers actively unlearned command-and-control management approaches. However, later TQM adopters benefit from predecessors' unlearning experiences, suggesting organizational learning about unlearning itself.

ISO Standards Contexts: ISO certification and standard transitions require unlearning previous compliance approaches. Fonseca (2015) examined unlearning during ISO 9001:2015 transition, finding that organizations treating certification ceremonially struggled with risk-based thinking adoption. Sampaio et al. (2009) documented unlearning of "certification-as-goal" mindsets toward "standards-as-tools" perspectives. Standard evolution provides structured opportunities for guided organizational unlearning.

Lean and Six Sigma: Process improvement methodologies require unlearning wasteful practices and variation-tolerant mindsets. Antony et al. (2012) studied Six Sigma implementation unlearning requirements. Laureani and Antony (2017) found that Lean transformations necessitate unlearning batch thinking and local optimization. However, over-zealous unlearning can eliminate valuable contextual adaptations, suggesting balanced approaches honoring legitimate local variations while eliminating genuine waste.

Digital Transformation: Industry 4.0 adoption requires unlearning traditional quality approaches. Tortorella et al. (2019) demonstrated that smart manufacturing implementation necessitates unlearning sequential inspection logic. Antony et al. (2023) found that AI-enabled quality prediction requires unlearning reactive problem-solving approaches toward predictive prevention mindsets. Digital contexts present both urgency (rapid technological change) and resources (technology-enabled unlearning tools) for effective unlearning.

Organizational Change Programs: Broader transformations encompass quality dimension changes. Hislop et al. (2014) studied unlearning during organizational restructuring. Rushmer and Davies (2004) examined unlearning in healthcare quality improvement, finding that clinical autonomy cultures resist unlearning individual practice variations. Change contexts benefit from explicit unlearning attention rather than assuming learning alone suffices for transformation.

Discussion

This systematic Discussion of these findings reveals several important patterns and implications for theory and practice. First, the taxonomy demonstrates that unlearning is not a monolithic phenomenon but rather comprises diverse processes varying across triggers, levels, mechanisms, outcomes, and contexts. This diversity suggests that universal prescriptions for unlearning prove inadequate; rather, effective unlearning requires contingent approaches tailored to specific situations. Organizations should diagnose their particular unlearning needs by identifying relevant trigger types, determining primary levels requiring attention, selecting appropriate mechanisms for their context, clarifying desired outcomes, and recognizing their specific quality management context characteristics. This diagnostic approach contrasts with generic change management approaches treating all organizational change similarly without recognizing unlearning's distinctive requirements.

Second, the findings reveal that unlearning operates through complex multi-level processes requiring coordination across individual, team, organizational, and inter-organizational levels. Interventions targeting only one level prove insufficient because unlearning at one level may be undermined by persistence at other levels. For example, organizational-level unlearning through procedure elimination may fail if individual-level mental models and team-level shared routines continue embodying obsolete assumptions. Conversely, individual-level unlearning may dissipate if organizational structures, systems, and procedures continue reinforcing outdated practices. This multi-level interdependence suggests that effective unlearning requires systemic interventions addressing multiple levels simultaneously or in coordinated sequence. Organizations should map how obsolete knowledge manifests across levels and design interventions targeting these multiple manifestations rather than assuming single-level interventions will cascade naturally.

Third, the research reveals important tensions between quality management's traditional emphasis on standardization, documentation, and knowledge preservation versus unlearning's imperative to discard obsolete knowledge. Quality management systems are fundamentally knowledge management systems that codify quality knowledge in procedures, specifications, and standards. This codification serves important functions including reducing variation, enabling training, facilitating auditing, and preserving institutional memory. However, codification also creates inertia because documented knowledge acquires institutional legitimacy and persistence that tacit knowledge lacks. Organizations struggle to unlearn documented knowledge because doing so requires formal decisions, approvals, and documentation updates that informal tacit knowledge changes bypass. This suggests that quality management systems should be designed with explicit unlearning mechanisms including sunset provisions requiring periodic relevance reviews, version control enabling archiving rather than deletion, and delegated authority for procedure retirement rather than requiring senior approval for all changes.

Fourth, the findings highlight that unlearning outcomes are contingent rather than deterministic. Unlearning does not automatically produce positive quality performance outcomes; rather, outcomes depend on what is unlearned, how effectively unlearning is implemented, what replaces unlearned elements, and how well transitions are managed. Research reveals inverted U-curve patterns where moderate unlearning improves performance by eliminating inefficiencies while preserving valuable knowledge, but excessive unlearning risks losing critical organizational capabilities, and insufficient unlearning maintains obsolete practices. This suggests that organizations should approach unlearning strategically rather than zealously, conducting knowledge value assessments before unlearning rather than assuming all historical practices warrant elimination.

Conclusion and Future Research Directions

This systematic literature review has synthesized 87 studies examining organizational unlearning within quality management contexts, developing a comprehensive five-dimensional taxonomy that organizes this previously fragmented literature. The research makes several important contributions to both theoretical understanding and practical application of unlearning as a strategic quality management capability.

Theoretical Contributions

From a theoretical perspective, this review has integrated previously disconnected research streams spanning organizational learning, change management, knowledge management, and quality management literatures. The proposed taxonomy provides a structured framework enabling cumulative knowledge development by categorizing unlearning processes along five dimensions: triggers that initiate unlearning, levels at which it operates, mechanisms through which it occurs, outcomes it produces, and quality management contexts within which it manifests. This multi-dimensional conceptualization moves beyond simplistic formulations treating unlearning as merely eliminating old knowledge before acquiring new knowledge. Instead, the taxonomy reveals unlearning as a complex organizational capability requiring sophisticated understanding of when, where, how, and why to discard obsolete knowledge while preserving valuable institutional memory.

The review reveals several important theoretical insights. First, unlearning operates through fundamentally different processes than learning, requiring distinct theoretical frameworks and management approaches rather than simply reversing learning processes. While learning emphasizes acquisition, retention, and application of knowledge, unlearning emphasizes identification, delegitimization, and elimination of knowledge. These different emphases require different organizational capabilities, leadership behaviors, and cultural values. Organizations cannot simply reverse their learning processes to achieve unlearning; rather, they must develop dedicated unlearning capabilities complementing their learning capabilities.

Second, the review illuminates inherent tensions between quality management's traditional emphasis on standardization, documentation, and knowledge preservation versus unlearning's imperative to discard obsolete knowledge. Quality management has historically emphasized stability, predictability, and consistency achieved through standardized procedures, documented best practices, and institutionalized knowledge. However, contemporary business environments characterized by rapid technological change, evolving customer expectations, and sustainability imperatives increasingly require flexibility, adaptation, and deliberate knowledge discarding. This creates a fundamental paradox: quality management systems must simultaneously preserve core principles while continuously updating applications, maintain process discipline while enabling innovation, and standardize practices while adapting to changing contexts. Resolving this paradox requires sophisticated organizational ambidexterity that balances seemingly contradictory requirements rather than choosing between them.

Third, the review reveals that unlearning proves particularly critical during quality paradigm transitions such as shifts from inspection-based to prevention-based quality management, from reactive to predictive quality

approaches, from product-quality to service-quality frameworks, from linear to circular economy quality thinking, or from analog to digital quality management. These paradigm transitions require not merely adding new practices to existing repertoires but fundamentally reconceptualizing what constitutes quality excellence. Organizations that attempt paradigm transitions through learning alone, without corresponding unlearning of contradictory existing practices, typically experience superficial adoption without genuine transformation. New practices layer atop old practices creating confusing hybrid systems that deliver neither old nor new paradigm benefits.

Fourth, the review demonstrates that unlearning capability increasingly constitutes a source of sustainable competitive advantage in dynamic environments. Organizations that develop deliberate, proactive unlearning capabilities adapt more rapidly to environmental changes, transform quality management approaches more effectively, and maintain relevance despite accelerating change. In contrast, organizations lacking unlearning capabilities experience progressive ossification as accumulated knowledge, routines, and assumptions increasingly constrain rather than enable quality excellence. The distinction between learning organizations and unlearning organizations may prove as significant as earlier distinctions between learning organizations and non-learning organizations.

Practical Implications

Several From a practical perspective, this review provides quality managers and organizational leaders with actionable frameworks and insights for implementing unlearning initiatives. The five-dimensional taxonomy enables practitioners to diagnose their specific unlearning needs by identifying relevant triggers, determining primary levels requiring attention, selecting appropriate mechanisms, clarifying desired outcomes, and recognizing contextual factors affecting implementation. Rather than generic change management approaches, the taxonomy supports context-specific unlearning strategies tailored to particular organizational situations.

The review identifies several practical recommendations for quality managers. First, organizations should implement regular knowledge obsolescence assessments evaluating whether existing quality practices, procedures, and assumptions remain relevant and effective. These assessments should employ explicit criteria including regulatory compliance, effectiveness in achieving intended results, efficiency compared to alternative approaches, and strategic alignment with organizational objectives. Without systematic assessment processes, obsolete knowledge accumulates indefinitely because organizational inertia favors retention over elimination.

Second, organizations should establish explicit unlearning mechanisms integrated into quality management systems rather than treating unlearning as ad hoc response to crisis. These mechanisms should include sunset provisions requiring periodic relevance reviews for all documented procedures, version control systems enabling archiving rather than permanent retention, delegated authority structures enabling unlearning decisions without requiring senior approval for routine obsolescence, and knowledge audit processes systematically identifying unlearning candidates. By institutionalizing unlearning alongside learning, organizations transform unlearning from reactive crisis response to proactive capability.

Third, organizations should provide transition support for individuals and teams experiencing expertise obsolescence. Unlearning creates psychological challenges when professional identities are tied to knowledge becoming obsolete. Support should include retraining programs developing new capabilities, role redesign creating positions leveraging transferable skills, career development planning identifying future-oriented development paths, and psychological safety enabling acknowledgment of uncertainty during transitions. Organizations that treat unlearning as individual deficiency rather than organizational development opportunity create resistance that undermines unlearning initiatives.

Fourth, organizations should balance unlearning with learning through integrated approaches addressing both knowledge elimination and knowledge acquisition. Training programs should explicitly identify obsolete practices being replaced, helping participants clear cognitive space for new knowledge. Quality system updates should simultaneously eliminate outdated components and introduce improvements rather than merely layering new atop old. Change initiatives should articulate what must be unlearned as clearly as what must be learned, providing explicit guidance regarding practices requiring abandonment.

Fifth, organizations should leverage technology to support unlearning through knowledge management systems with sunset capabilities, analytics identifying obsolete procedures, and collaboration platforms facilitating knowledge consolidation. Technology can automate certain unlearning aspects such as removing outdated documents from active systems while preserving historical archives, flagging procedures never accessed as unlearning candidates, and enabling virtual collaboration for knowledge consolidation initiatives. However,

technology proves insufficient without corresponding attention to social, political, and psychological dimensions of unlearning.

Limitations

The review also identifies several important limitations constraining interpretation and generalization of findings. First, the restriction to English-language articles in four databases potentially excluded relevant research published in other languages or outlets, particularly research from Asian, Latin American, and other non-Western contexts that may offer distinctive perspectives on unlearning in quality management. Second, publication bias likely affects the sample, as academic journals preferentially publish positive findings over null results, potentially inflating perceived benefits of unlearning while obscuring contexts where unlearning proves ineffective or counterproductive. Third, conceptual heterogeneity complicates synthesis, as authors employ varied definitions and operationalizations of unlearning ranging from passive forgetting to active elimination to cognitive reframing. This definitional diversity enables rich theoretical development but hinders precise integration across studies. Fourth, methodological limitations include predominance of conceptual and qualitative studies limiting generalizability, scarcity of longitudinal research constraining understanding of process dynamics, and absence of validated measurement instruments preventing rigorous hypothesis testing.

Future Research Agenda

Based on identified gaps, the review proposes a comprehensive future research agenda organized around six themes. First, measurement and operationalization research should develop and validate instruments assessing unlearning at individual, team, and organizational levels within quality contexts. Researchers need reliable measures distinguishing unlearning from non-use or temporary suspension, indicators signaling unlearning completion versus superficial adoption, and quantitative approaches assessing unlearning intensity, speed, and thoroughness. Methodological approaches should include scale development studies employing psychometric validation, longitudinal designs tracking knowledge disappearance markers, multi-rater assessments capturing different stakeholder perspectives, and computational text analysis identifying unlearning signals in organizational communication.

Second, research examining unlearning-performance relationships should systematically test hypothesized linkages between unlearning and various quality performance indicators. Specific questions include: Under what conditions does unlearning improve versus harm quality performance? What mediating mechanisms link unlearning to quality outcomes? How do temporal dynamics affect unlearning-performance relationships? What optimal unlearning levels balance obsolescence elimination and capability preservation? Methodological approaches should include longitudinal studies with repeated quality performance measurement before, during, and after unlearning initiatives, quasi-experimental designs comparing unlearning and non-unlearning organizations, structural equation modeling testing mediation hypotheses, and regression discontinuity designs exploiting natural unlearning triggers.

Third, research on contextual contingencies should identify boundary conditions specifying when and where specific unlearning approaches work best. Questions include: How do national cultures affect unlearning processes and effectiveness? Do unlearning requirements differ across manufacturing, service, and knowledge industries? How does organizational size, age, or structure moderate unlearning capability? What role do industry maturity, regulatory intensity, or competitive dynamics play? Methodological approaches should include comparative case studies across contexts, meta-analyses testing context as moderator, configurational approaches such as fuzzy-set qualitative comparative analysis identifying context-specific unlearning recipes, and cross-cultural studies examining cultural value impacts.

Fourth, research on process dynamics and micro-foundations should examine actual unlearning processes including how knowledge disappears, what psychological and social mechanisms operate, and what implementation steps prove necessary. Questions include: What specific activities constitute effective unlearning processes in quality contexts? How do individuals experience unlearning psychologically and emotionally? What social dynamics facilitate or inhibit team-level unlearning? How do unlearning processes unfold temporally with identifiable stages? Methodological approaches should include ethnographic studies observing unlearning initiatives in real-time, experience sampling methods capturing moment-to-moment unlearning experiences, social network analysis tracking knowledge flow changes, and process tracing methods mapping unlearning activity sequences.

Fifth, research on technology's role should investigate how technologies enable or constrain unlearning while simultaneously requiring unlearning themselves. Questions include: How can artificial intelligence support identification of obsolete quality knowledge? What roles can knowledge management systems play in facilitating

systematic unlearning? How does technology-embedded knowledge resist unlearning efforts? Can simulation technologies enable risk-free unlearning experimentation? Methodological approaches should include design science research developing unlearning-support technologies, field experiments testing technology-enabled unlearning interventions, computational modeling simulating unlearning dynamics, and qualitative studies examining human-technology interaction during unlearning.

Sixth, research on unlearning capability development should examine how unlearning capability develops and can be deliberately cultivated. Questions include: What organizational practices build unlearning capability over time? How do organizations learn to unlearn more effectively? Can unlearning capability constitute sustainable competitive advantage? What training approaches develop individual unlearning competence? Methodological approaches should include longitudinal studies tracking capability development, action research implementing capability-building interventions, surveys examining capability antecedents and consequences, and qualitative studies investigating capability-building practices.

Concluding Remarks

In conclusion, organizational unlearning represents a critical yet frequently overlooked dimension of quality management and continuous improvement. As business environments accelerate their rate of change driven by digital transformation, sustainability imperatives, and evolving stakeholder expectations, the ability to unlearn obsolete knowledge, practices, and assumptions becomes increasingly essential for quality excellence. Organizations clinging to outdated quality approaches, however successful historically, risk competitive obsolescence and diminished relevance. The journey toward truly learning organizations requires acknowledging that learning alone proves insufficient. Organizations must also become unlearning organizations capable of strategic knowledge discarding, comfortable with productive forgetting, and skilled at continuous renewal.

Quality management, with its systematic approaches, improvement orientation, and evidence-based philosophy, stands well-positioned to lead organizational unlearning capability development. The principles underlying quality management such as customer focus, process thinking, data-driven decision-making, and continuous improvement remain fundamentally valid even as specific applications evolve. Quality professionals understand that improvement requires both addition and subtraction, both learning and unlearning, both preserving what works and discarding what no longer serves organizational objectives. By explicitly integrating unlearning into quality management frameworks, organizations can achieve the dynamic stability required for sustained excellence in increasingly volatile environments.

This review contributes to that integration by organizing existing knowledge, proposing a comprehensive taxonomy, and charting paths toward deeper understanding. The five-dimensional framework spanning triggers, levels, mechanisms, outcomes, and contexts provides structure for both research and practice. However, significant work remains to transform unlearning from conceptual possibility to systematic organizational capability. Future research answering the questions posed in this review will further enhance both theoretical understanding and practical application of unlearning in quality management contexts.

Quality management has evolved from inspection to prevention, from quality control to quality assurance to total quality management, from reactive problem-solving to proactive improvement. The next evolution may involve integrating unlearning capability, recognizing that organizational memory requires not only accumulation but also strategic discarding, not only learning but also deliberate forgetting, not only preserving best practices but also abandoning practices that were once best but no longer serve organizational objectives. As organizations navigate digital transformation, sustainability imperatives, and unprecedented market volatility, the ability to unlearn may distinguish quality leaders from quality laggards. This review contributes to building that distinguishing capability.

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