International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

# Establishing a Business Performance Improvement Unit in the Utility Sector

**Ruba Abdalla Abualhuda[1], Noora Alkhatib[2]**

**Abstract:** ***Utility organizations often face fragmented improvement efforts and a lack of structured follow-up, leading to inefficiencies and misalignment. This paper presents a framework for establishing a centralized Business Performance Improvement (BPI) Unit using Lean, Six Sigma, and the DMAIC methodology to address these issues. The proposed unit structure includes distinct pillars for process improvement, business support, and quality innovation, supported by qualified staff and a unified governance system. A centralized tracking database ensures transparency and informed decision-making. The framework fosters strategic alignment, operational efficiency, and sustainable performance. The paper concludes by recommending capability development and digital integration to enhance the long-term impact of BPI units.***

**Keywords:** Business Performance Improvement, Continuous Improvement, Lean Six Sigma, Governance Framework, Process Improvement

## 1. Introduction

Utilities in the electricity and water sector face increasing pressure to deliver reliable services while optimizing costs and improving efficiency. As demand rises and infrastructure ages, organizations must find innovative ways to maintain reliability while improving efficiency. The electricity and water sectors are undergoing rapid transformation, driven by technological advancements, regulatory pressures, and increasing customer expectations. Traditional operational models often struggle to adapt to these changes, leading to inefficiencies and missed opportunities. To address these challenges, many organizations have embraced structured improvement frameworks such as Lean and Six Sigma and Agile, which emphasize waste elimination, process optimization, and data-driven decision-making. These gaps included the absence of specialized professionals dedicated exclusively to managing and driving these initiatives. Without such expertise, improvement projects often lacked consistency and momentum. Another critical shortfall was in the post-implementation phase—there was no systematic approach to capturing results, analysing performance, or revisiting initiatives when adjustments were needed. Furthermore, the organization lacked a centralized database to track all improvement efforts, making it difficult to prevent duplication and ensure alignment with strategic objectives. To bridge these gaps, the Business Performance Improvement (BPI) unit was established as a strategic enabler of organizational excellence. Acting as the central hub for all improvement initiatives, the BPI unit ensures projects are well-structured, feasible, and aligned with corporate goals. Its responsibilities extend beyond implementation to include rigorous post-project evaluation, measurement of outcomes, and continuous optimization. By introducing governance, expertise, and transparency, the BPI unit not only drives sustainable performance improvements but also fosters a culture of innovation and continuous growth across the organization. This study aims to propose a structured framework, developed by industrial engineers, for the establishment and operation of a centralized Business Performance Improvement (BPI) Unit in the utility sector to enhance operational efficiency and strategic alignment

## 2. Literature Review

### Structured Improvement Frameworks

Lean methodology, originally developed within the automotive industry through the Toyota Production System (TPS), focuses on eliminating waste and maximizing customer value." *(Liker & Franz, 2023).* In utility sectors, LEAN has been adapted to streamline maintenance workflows, reduce downtime, and optimize resource allocation. Studies indicate that LEAN practices can significantly improve operational efficiency by minimizing non-value-added activities (Antony et al., 2019). However, successful adoption requires cultural alignment and leadership commitment, as resistance to change often undermines implementation efforts. Among the most effective frameworks leveraged for optimizing processes across industries Six Sigma is a data-driven methodology aimed at reducing process variability and improving quality." (NCBI Bookshelf, 2023). Within electricity and water utilities, Six Sigma projects have targeted service reliability and asset management. Empirical evidence suggests that Six Sigma enhances customer satisfaction and operational performance when integrated with robust measurement systems (Antony, 2020). Despite these benefits, sustaining improvements remains challenging without dedicated governance structures and continuous monitoring.

Literature consistently identifies the absence of dedicated improvement professionals as a barrier to success. Without specialized roles, initiatives often lack consistency, structured methodologies, and momentum (Antony et al., 2019). Internal organizational analyses reinforce the need for expertise in LEAN, Six Sigma, and process optimization to drive sustainable change. Many organizations fail to institutionalize post-project reviews, leading to missed opportunities for learning and continuous improvement. Research emphasizes the importance of feedback loops and performance tracking systems to validate benefits and identify areas for refinement (De Feo, 2023). Moreover, the absence of centralized databases for improvement initiatives results in duplication and misalignment with strategic objectives. Best practices emphasize the importance of governance frameworks that promote transparency, clear prioritization, and alignment with organizational goals." (ISO, 2021).

A review of existing literature reveals a significant research gap regarding the methodology for constructing a dedicated Business Performance Improvement (BPI) unit within organizations. While numerous studies extensively discuss Lean, Six Sigma, and Agile as frameworks for process optimization and continuous improvement, they primarily focus on implementation at the project or departmental level rather than on establishing a centralized governance structure. Published papers emphasize tools, techniques, and case studies of operational enhancements but rarely provide a systematic approach for designing, staffing, and institutionalizing a specialized unit responsible for driving enterprise-wide improvement initiatives. Even comprehensive reviews of Lean Six Sigma applications across sectors highlight success factors such as leadership commitment and cultural alignment, yet they stop short of detailing organizational models or frameworks for creating such units (Sakib et al., 2025; Mogatusi et al., 2025). This absence of guidance on structural design, authority allocation, and integration with corporate strategy underscores the novelty and necessity of research focused on developing a formal methodology for constructing a BPI unit managed by continuous improvement specialists. In conclusion, the literature demonstrates that Lean and Six Sigma methodologies have delivered measurable improvements in operational efficiency, quality, and customer satisfaction across utility sectors. However, these frameworks are predominantly applied at the project or departmental level, leaving a critical gap in guidance for institutionalizing continuous improvement through a centralized Business Performance Improvement (BPI) unit. The absence of structured governance, dedicated roles, and systematic feedback mechanisms often limits the sustainability of gains achieved. Addressing this gap requires developing a formal methodology for designing and integrating a BPI unit into corporate strategy one that ensures alignment, accountability, and long-term value creation. this research aims to bridge that void by proposing a comprehensive framework for constructing and managing such units, thereby advancing organizational capability for enterprise-wide performance improvement.

This work is significant in bridging the gap between isolated improvement projects and enterprise-wide process governance, offering a scalable model for continuous improvement across utility organizations.

## 3. Framework and Methodology

### 3.1 Gap Analysis

The starting point for establishing the Improvement & Process Management Unit was a structured gap analysis across existing operations and initiatives. Management reviewed past and ongoing projects, lessons learned, and audit findings and found recurring challenges: limited internal expertise in structured improvement methodologies, weak post-implementation tracking of initiatives, and the absence of a centralized database to record and monitor projects. Interviews with stakeholders and reviews of historical reports confirmed that improvements were often implemented in isolation, with no clear ownership or long-term visibility. These gaps highlighted the need for a dedicated unit with clear mandate, tools, and governance.

### 3.2 Unit Structure

The structure of the Business Performance & Improvement Unit is intentionally designed to create a complete, end-to-end improvement ecosystem that supports both operational excellence and strategic transformation within the organization. The unit is divided into three functional pillars, each addressing a critical dimension: Process Improvement, Business Support Improvement, Quality Management and Innovation.

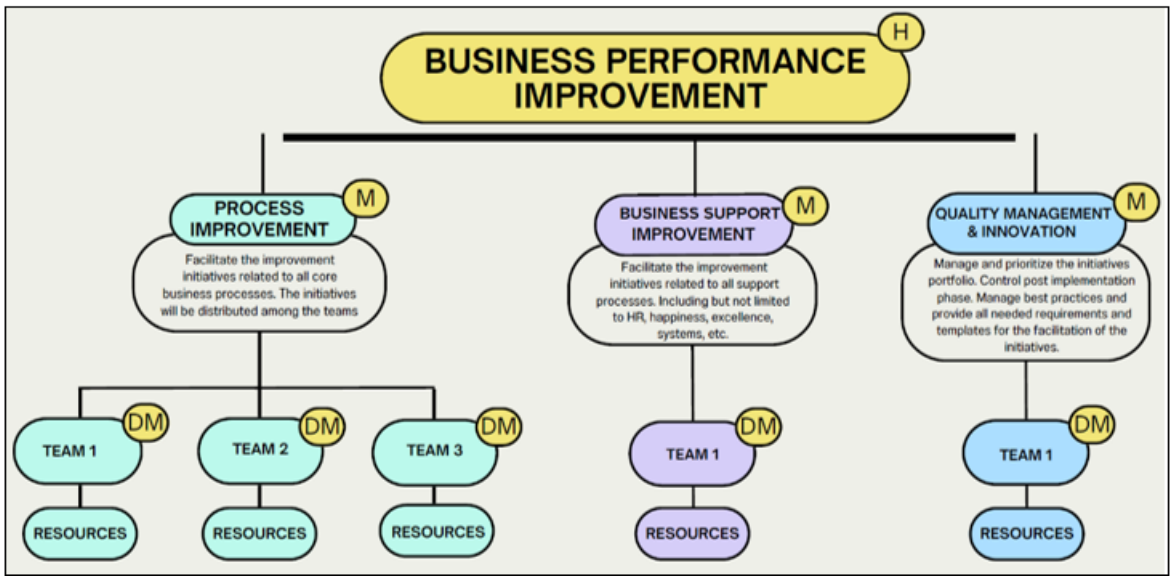


**Figure 1:** Structure of the Business Performance Improvement Unit

This figure presents the three-pillar structure of the BPI Unit, each pillar serves a distinct purpose, and together they enable the unit to manage initiatives with precision, efficiency, and long-term sustainability. Given that internal support services and core operational processes have different characteristics, levels of complexity, and stakeholders, the structure separates them to ensure each area receives the right focus and expertise. In Process Improvement the team is responsible for

improving the operational processes. These are the processes that directly impact operational performance, outcomes, and day-to-day technical activities. Business Support Improvement focuses on the improvement of non-operational, internal support processes that enable the core business to function effectively. Quality Management & Innovation plays a strategic role within the unit by ensuring that improvements are not only implemented effectively but are also aligned with global quality standards and forward-looking innovation practices. This pillar acts as the bridge between structured process improvement and future-driven organizational development.

### 3.3 Staffing and Expertise

A focused staffing strategy was adopted to recruit qualified industrial engineers with strong expertise in Lean, Six Sigma, and continuous improvement. Selection criteria prioritized accredited certifications, proven experience in leading improvement initiatives, and the ability to collaborate effectively across functions. This ensured the unit is supported by professionals with the technical proficiency and analytical capability required to deliver effective and sustainable process improvements. Beyond technical expertise, equal emphasis was placed on the soft skills that enable improvement initiatives to succeed in dynamic organizational environments. Staff were selected for their ability to communicate complex ideas with clarity, foster trust through active listening, and adapt their approach to diverse stakeholder needs. Strong interpersonal skills, resilience in the face of change, and a collaborative mindset ensured that improvement teams could build consensus, manage resistance, and inspire engagement across all levels of the organization. These qualities not only strengthened cross-functional cooperation but also created a culture of openness and continuous learning, essential for sustaining long-term transformation.

### 3.4 Methodology

To ensure consistency and methodological discipline, Lean and Six Sigma tools were systematically embedded into daily workflows across the unit. Standard techniques such as value stream mapping, root-cause analysis, process capability assessment, and waste elimination were integrated into the facilitation and evaluation of all improvement initiatives. The unit adopted the DMAIC methodology as its core project management framework, guiding teams through a structured cycle of defining problems, measuring current performance, analysing root causes, implementing targeted improvements, and establishing control mechanisms to sustain results. This structured approach ensures initiatives remain data-driven, goal-oriented, and thoroughly documented with measurable outcomes. As shown in Table 1, Business Performance Improvement (BPI) Framework provides a structured, data-driven approach for enhancing organizational efficiency and aligning improvement efforts with organization strategic objectives. Projects implemented through this framework are triggered by a variety of sources, including strategic requirements that ensure alignment with long-term business goals, direct requests from corporate leadership tied to enterprise-wide priorities, and large-scale transformation projects. Additional triggers arise from department-specific requests seeking to address operational bottlenecks or quality concerns, as well as insights gained through periodic process reviews that highlight inefficiencies or outdated practices.

**Table 1:** Framework of Business Performance Improvement unit

| | Business Performance Improvement Framework | | | | | |
|---|---|---|---|---|---|---|
| identify & Prioritize improvement initiatives that have the greatest impact and aligned with organization strategy. | **Define** | **Measure** | **Analyze** | **Improve** | **Control** | Conduct post-implementation reviews for improvement initiatives to confirm the realization of intended business benefits, as required. |
| | Clearly define the problem , project goals , customer requirements. | Understand the process | Analyze data | Generate ideas | Deliver the results and ensure sustainability of the new process | |
| | | Collect data | Identify issues, bottlenecks | Evaluate & prioritize ideas | Establish Continuous Improvement plan | |
| | | | Asses issues | Establish recommendations | | |
| | | | | Obtain management approval | | |
| **Tools** | **Tools** | | | | | **Tools** |
| Strategic Prioritization matrix | Prepare Project Charter | VSM | Fishbone diagram | Brainstorming | Dashboard | Feedback mechanism |
| Impact effort matrix | Prepare action plan | Process mapping | Pareto chart | Kaizen | Control plan | Performance indicator |
| Pareto analysis | | | Histogram | Kanban | Lesson learned | |
| SWOT analysis | | | 5S Methodology | A3 Problem Solving | | |
| | **Assessment Phase** | | | **Development & Implementation Phase** | | |

The BPI team itself also contributes recommendations based on analytical reviews, benchmarking, and best practices, while audit reports identifying opportunities for improvement (OFI) and productivity reports highlighting performance gaps. The framework begins with the Identification and Prioritization stage, where improvement opportunities are selected based on potential impact, feasibility, and strategic alignment using tools such as the Strategic Prioritization Matrix, Impact–Effort Matrix, Pareto Analysis, and SWOT Analysis. Once priorities are established, the Define phase focuses on clearly articulating the problem, project objectives, and customer requirements, supported by tools including the Project Charter and Action Plan. In the Measure phase, the current-state process is analyzed through performance data collection and workflow visualization using Value Stream Mapping (VSM) and Process Mapping. The Analyse phase aims to identify root causes, bottlenecks, and performance gaps using tools such as the Fishbone Diagram, Pareto Chart, Histogram, 5S methodology, and A3 problem solving. Based on these insights, the Improve phase concentrates on developing, evaluating, and prioritizing solutions through techniques including brainstorming, Kaizen

workshops, and Kanban, leading to actionable recommendations and management approval for implementation. The Control phase ensures that the improved process delivers sustained results through ongoing monitoring, dashboards, control plans, performance indicators, and documenting lessons learned to support organizational knowledge. Finally, post-implementation reviews are conducted to validate that the intended business benefits have been realized, using mechanisms such as structured feedback processes and KPI tracking, reinforcing a culture of continuous improvement. Together, these stages and tools form an integrated framework that strengthens decision making, enhances operational performance, and embeds sustainable improvement practices across the organization.

### 3.5 Governance and Database Development

A comprehensive governance framework was established to ensure transparency, accountability, and consistency across all improvement initiatives. As part of this framework, a centralized tracking system was established to consolidate initiative data, monitor progress, and record key milestones. This database serves as a unified source for all initiatives, including project charters, KPIs, timelines, risks, and post-implementation results. The system enables leadership to access updates, supports data-driven decision-making, and ensures that best practices and lessons learned are systematically recorded and accessible for future initiatives.

#### 3.5.1 Roles and Responsibilities

The BPI unit worked closely with process owners to ensure alignment, clarify responsibilities, and support effective implementation throughout the rollout. This collaboration began with joint planning sessions to confirm strategic objectives, identify improvement opportunities, and define the scope and expected outcomes of each initiative. Clear roles and responsibilities between the BPI unit and cross-functional departments were established, as shown in Table 2, ensuring that process owners understood their accountability in data provision, process validation, and execution of approved improvements.

**Table 2:** Roles and Responsibilities of BPI and cross depts

| BPI Role | Departments Roles | Shared Roles |
|---|---|---|
| **Improvement initiatives** | | |
| Mediate discussions, workshops, and brainstorming sessions to co-create solutions | Communicate challenges and improvement suggestions | Identify challenges and opportunities |
| Analyze data and root causes | Allocate resources to support | Setting priorities for performance improvement initiatives |
| Evaluate outcomes and lessons learned | Supply accurate and timely data for performance analysis | Co-developing action plans and implementation timelines |
| Research and introduce best practices, tools, and methodologies | Engage in workshops, pilot programs, and feedback sessions | Monitoring progress and adjusting plans as needed |
| Deliver regular performance reports and actionable insights to leadership | Maintain accountability for implementing and sustaining improvements within their areas | — |
| **Process management** | | |
| Initiate annual process review task | Communicate challenges and improvement suggestions | Identify challenges and opportunities |
| Communicate guideline and timeline | Allocate resources to support | Setting priorities for performance improvement initiatives |
| Validate accuracy of proposed update | Supply accurate and timely data for performance analysis | Co-developing action plans and implementation timelines |
| Monitor task progress and deadlines | Engage in workshops, pilot programs, and feedback sessions | Monitoring progress and adjusting plans as needed |
| Provide support and clarification | Maintain accountability for implementing and sustaining improvements within their areas | — |

To reinforce role clarity and governance during implementation, responsibilities and decision-making authority were further structured using a RACI framework, as shown in Table 3. This matrix defined accountability, responsibility, consultation, and information flows across the BPI unit, process owners, and supporting departments, reducing ambiguity and strengthening coordination. During execution, the BPI unit provided continuous support through targeted workshops, technical guidance, and one-to-one coaching on Lean, Six Sigma, and process-improvement tools. The unit facilitated process mapping, root-cause analysis, and solution prioritization to ensure that proposed interventions were practical, data-driven, and aligned with operational realities. In parallel, the BPI unit coordinated cross-departmental inputs, monitored progress against agreed timelines, and proactively addressed emerging challenges.

By combining clearly defined roles, a structured RACI model, and ongoing technical and coordination support, the BPI unit enabled smooth implementation, strengthened ownership among process owners, and enhanced the long-term sustainability of improvement initiatives.

**Table 3:** RACI Matrix of BPI unit and cross dept. for core process improvement

| Process Management Activity | BPI | Department | Vice president (VP) |
|---|---|---|---|
| Initiate annual process review task | A | I | I |
| Communicate guideline and timeline | R | C | I |
| Review existing process and workflow | C | R | I |
| Identify any process updates | C | R | I |
| Validate accuracy of proposed updates | R | C | A |
| Update workflows | I | R | I |
| Monitor task progress and deadlines | A | I | I |
| Provide support and clarification | R | C | I |
| Finalize and approve updated workflows | I | A | A |

R: Responsible, A: Accountable, C: Consulted, I: Informed

### 3.5.2 Data Governance

Having a single unit (BPI) responsible for all improvement initiatives within the organization is far more effective than dispersing responsibilities across multiple departments. Centralizing ownership ensures that data management is handled consistently by one accountable body, which strengthens governance and eliminates the risks of duplication, fragmented reporting, or conflicting interpretations. Hence, the creation of a system that consolidates all initiative data—capturing progress updates, lessons learned, and archiving closed initiatives—provides stronger governance of initiative data. This results in better analysis, easier retrieval of information, and more informed decision-making. Beyond its operational role, the centralized database is a cornerstone of data governance. By enforcing standardized data collection, consistent definitions of metrics, and controlled access, it ensures that information is accurate, reliable, and secure across the organization. The system improves clarity centralizing information in one validated reference point, reducing duplication and conflicting reports especially in Lean, Six Sigma, and data analytics reports, and strengthening accountability for project outcomes. It also embeds compliance by maintaining auditable records of decisions and results, aligning with organizational policies and regulatory requirements. Furthermore, the database enhances organizational learning by preserving and consolidating critical insights, including best practices and lessons learned, for application in future projects. In this way, the centralized database not only enables leadership to access timely updates and make data-driven decisions but also operationalizes the broader principles of data governance: integrity, consistency, accountability, and accessibility of organizational data.

### 3.6 Expected benefits

The establishment of the BPI Unit is expected to deliver a range of strategic and operational benefits across the organization. By introducing a structured approach to process improvement supported by Lean, Six Sigma, and DMAIC methodologies the unit will enhance efficiency, reduce waste, and strengthen cross-functional collaboration. The centralized governance model and unified tracking systems will improve transparency, consistency, and accountability, enabling leadership to make data-driven decisions with greater confidence. At the same time, challenges can be anticipated, including change resistance, the need for continuous capability building, and the complexity of aligning diverse stakeholders around shared process objectives. However, these challenges can be mitigated through effective communication, strong sponsorship, and sustained engagement. Importantly, the BPI Unit directly supports the organization's strategic direction by promoting operational excellence, fostering innovation, and ensuring that processes remain agile and adaptable to future demands. Through its structured methods, governance framework, and performance-driven mindset, the unit becomes a key enabler of long-term organizational resilience and strategic alignment.

## 4. Conclusion

**Summary of Key Findings**

The development of the BPI Unit demonstrates the organization's commitment to embedding continuous improvement as a core capability. The methodology covering gap analysis, unit design, specialized staffing, process integration, and governance establishes a solid foundation for consistent and sustainable results. With dedicated pillars for process improvement, business support enhancement, and quality and innovation, the unit is equipped to address both operational challenges and strategic priorities.

**Recommendations**

To maximize impact, it is recommended that the organization continue investing in capability development, particularly in Lean, Six Sigma, and data analytics. Strengthening cross-departmental collaboration and maintaining strong executive sponsorship will be essential to ensure smooth adoption of new workflows. It is also recommended to periodically review the BPI Unit's structure, tools, and methodologies to ensure continued alignment with evolving business needs.

**Suggestions for Future Research**

Future studies could explore the long-term effectiveness of centralized improvement units, comparing outcomes across different organizational models. Additional research may focus on integrating emerging technologies such as process mining, automation, and AI-driven analytics into BPI practices to enhance accuracy, speed, and predictive capability. Examining cultural factors that influence improvement adoption could also provide valuable insights for sustaining organizational transformation.

## References

[1] Antony, J. (2020). Lean Six Sigma for the service industry. Routledge.
[2] Antony, J., Snee, R., & Hoerl, R. (2019). Lean Six Sigma: Yesterday, today and tomorrow. International Journal of Quality & Reliability Management.
[3] De Feo, J. A. (Ed.). (2023). Juran's quality handbook: The complete guide to performance excellence (7th ed.). McGraw-Hill Education.

[4] International Organization for Standardization. (2021). ISO 9001:2015 quality management systems—Requirements. ISO.
[5] Kerzner, H. (2022). Project management best practices: Achieving global excellence (5th ed.). Wiley.
[6] Kotter, J. P. (2021). Change: How organizations achieve hard-to-imagine results in uncertain and volatile times. Wiley.
[7] Lean and continuous improvement use and success in energy-based utility sector. (2025). International Journal of Lean Six Sigma. Advance online publication.
[8] Liker, J. K., & Franz, J. (2023). The Toyota Way, second edition: 14 management principles from the world's greatest manufacturer. McGraw-Hill.
[9] Nonaka, I., & Takeuchi, H. (2021). The wise company: How companies create continuous innovation. Oxford University Press.
[10] Parmenter, D. (2021). Key performance indicators: Developing, implementing, and using winning KPIs (4th ed.).
[11] Tidd, J., & Bessant, J. (2021). Managing innovation: Integrating technological, market, and organizational change (7th ed.).
[12] Future trends of Lean Six Sigma and process excellence. (2025). World Journal of Advanced Research and Reviews