Process-Based Organisation Design for Public Hospital Efficiency

A.N. Mosia [1*] & B.C.D. Nyaka[1]

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Contact details
∗   Corresponding author
mosian@unisa.ac.za

Author affiliations
1   Department of Industrial and Engineering Management, University of South Africa, South Africa

ORCID® identifiers
A.N. Mosia
https://orcid.org/0000-0002-4272-7422

B.C.D. Nyaka
https://orcid.org/0000-0002-6372-6840

The central idea of process-based organisation design is that organising a firm around core business processes leads to efficiency. We adopted a qualitative research approach in this study to investigate whether the implementation of a process-based organisation design would be advisable in public hospitals. The data comes from a database compiled by the Statistical Office of the Gauteng Department of Health and from a written survey questionnaire that was sent to the chief executive officers of 15 hospitals. We used statistical analysis to measure hospital efficiency, and factor analysis and regression analysis to test our hypothesis. The data was mined from the value stream of each hospital. Our finding is that a high degree of process-based organisation in hospitals had a moderate but significant positive effect on their efficiency. The main implication is that hospitals should implement process-based operations in order to improve their efficiency. However, to achieve positive effects on efficiency, it would be important to observe some implementation rules.

OPSOMMING

Die sentrale idee van prosesgebaseerde organisasie-ontwerp is dat die organisering van 'n onderneming rondom kernbesigheidsprosesse tot doeltreffendheid lei. Ons het 'n kwalitatiewe navorsingsbenadering in hierdie studie gevolg om te ondersoek of die implementering van 'n prosesgebaseerde organisasie-ontwerp raadsaam sou wees in openbare hospitale. Die data kom van 'n databasis wat saamgestel is deur die Statistiese Kantoor van die Gautengse Departement van Gesondheid en van 'n geskrewe opnamevraelys wat aan die uitvoerende hoof van 15 hospitale gestuur is. Ons het statistiese analise gebruik om hospitaaldoeltreffendheid te meet, en faktoranalise en regressie-analise om ons hipotese te toets. Die data is ontgin uit die waardestroom van elke hospitaal. Ons bevinding is dat 'n hoë mate van prosesgebaseerde organisasie in hospitale 'n matige maar beduidende positiewe effek op hul doeltreffendheid gehad het. Die hoofimplikasie is dat hospitale prosesgebaseerde bedrywighede moet implementeer om hul doeltreffendheid te verbeter. Om positiewe effekte op doeltreffendheid te bereik, sal dit egter belangrik wees om 'n paar implementeringsreëls in ag te neem.

1. INTRODUCTION

The persistent challenge of delivering high-quality, cost-effective care in public hospitals has driven the exploration of various organisational designs aimed at improving efficiency. One such approach is process-based organisation design, which originated in the early 1990s with the advent of business process re-engineering (BPR), led by seminal works such as [7] and [2]. These authors recommend a radical redesign of organisational workflows to achieve breakthrough improvements in performance. The premise was that, by structuring an organisation around its core business processes rather than according to traditional functional hierarchies, it would be possible to enhance both operational efficiency and service quality.

Although the initial wave of enthusiasm for process orientation had waned by the early 2000s, the concept has proven to be durable. Its principles have become embedded in broader organisational paradigms such as modularisation [18], lean thinking [23], and supply chain management [9]. In healthcare, particularly in hospitals, the adoption of process thinking has been advocated to address fragmented care delivery, siloed departments, and administrative inefficiencies [11].

Despite widespread interest in and anecdotal support for process orientation in healthcare, rigorous empirical research on its organisational application, especially quantitative assessments of the degree of process-based organisation in hospitals, remains limited. Most studies focus on the outcomes of isolated re-engineering interventions (e.g., [4]; [10]) rather than on the broader organisational design or the maturity of process orientation as a continuous, evolving attribute. Moreover, while qualitative case studies (e.g., [19]; [12]) have illuminated the value of process thinking in clinical and administrative settings, they fall short of establishing generalisable, evidence-based links between process-based structures and organisational efficiency.

This study seeks to address this gap by asking the question, "To what extent does the degree of process-based organisation influence the operational efficiency of public hospitals?" To answer this question, the research adopts a quantitative approach that moves beyond the binary classification of hospitals as "re-engineered" or "not re-engineered". Instead, it measures the degree of process orientation as a continuous construct, independent of whether a formal BPR project was implemented. In doing so, it follows the reasoning of [13], who argue that process-based structures can also evolve incrementally through sustained structural and procedural improvements.

The research's contribution is twofold. First, it operationalises and measures the construct of process-based organisation in the public hospital context, thereby offering a replicable framework for future research. Second, it empirically tests the relationship between this construct and hospital efficiency, thus contributing to the sparse but emerging body of knowledge on the structural determinants of healthcare performance ([21]; [22]; [24]).

By integrating insights from organisational theory and healthcare management, this paper builds on and challenges earlier perspectives that equate process orientation solely with radical change. Instead, it positions process-based organisation as a scalable, measurable, and potentially incremental design principle with substantial implications for improving public hospital efficiency.

Recent studies have renewed the focus on evaluating these concepts in hospital settings. A systematic review of process-oriented hospital design highlighted consistent improvements in balanced scorecard dimensions, and in financial, operational, clinical, and patient-related outcomes, even in studies up to 2024. Work in the Netherlands echoes this finding, showing how many hospitals are transitioning incrementally from functional to hybrid or centre-based designs to better-managed care for complex, multi-morbid patients. Meanwhile, a 2025 meta-analysis of East African hospitals confirmed a wide variation in technical efficiency, and emphasised the need to identify the structural and process drivers of efficiency.

Despite these insights, the literature still lacks quantitative measures of the degree of process orientation in hospitals – an essential construct beyond binary re-engineering status. Previous empirical studies tended to evaluate outcomes after re-engineering programmes, rather than assessing process maturity as a continuous organisational dimension. This gap limits our understanding of how incremental or non-BPR-driven process improvements influence efficiency. Building on the organisational theorists [13], [11], and [25], we argue in this work that process orientation can and often does emerge through cumulative, evolutionary change.

2. LITERATURE REVIEW

The conceptual roots of process-based organisation design lie in the BPR movement of the early 1990s. Pioneered by [7] and [2], BPR promoted the radical redesign of business processes to achieve dramatic improvements in performance metrics such as cost, quality, and speed. BPR rejected traditional, functionally siloed organisational structures in favour of workflows organised around core processes. [8] famously described BPR as the "fundamental rethinking and radical redesign" of work. However, early implementations of BPR, particularly in healthcare, often failed because of poor change management, excessive disruptions, and an inadequate alignment with professional cultures ([15]; [19]).

As a result, interest in the concept waned in the early 2000s. Rather than disappearing, process orientation evolved. Many of its principles became embedded in broader concepts such as modularisation [18] and lean healthcare [9],[23]. [13] suggested that organisations could move toward process-based structures incrementally, rather than through radical redesign. This evolutionary approach would be particularly relevant in complex environments such as hospitals, where change is often path-dependent and resource-constrained.

A significant body of literature links process orientation to improvements in performance indicators such as cost containment, throughput, and patient satisfaction. For instance, the balanced scorecard framework [26] has been widely applied in hospitals to track performance in the financial, operational, and clinical domains, often in tandem with process redesign efforts [27]. More recent research provides mixed but promising evidence. [28] found that a higher degree of process orientation was associated with better IT-enabled coordination and performance in Swiss hospitals.

[25] noted that Dutch hospitals that gradually adopted process-based structures reported improvements in care quality and resource use, particularly for multi-morbid patient populations. Yet many studies rely on case-based or qualitative methods, and rarely offer quantitative metrics for the degree of process-based design. For example, [24] described how the reorganisation of services around patient conditions (as at the Cleveland Clinic) led to better outcomes and reduced costs; however, [24] did not measure the maturity of process orientation in different units.

In the hospital context, process orientation aims to overcome inefficiencies stemming from professional silos, duplication of effort, and lack of coordination between departments [11]; [24]. Empirical studies, such as those by [12] and [22], have documented benefits such as improved care coordination, reduced errors, and enhanced patient satisfaction. More recently, a systematic review by [25] observed that hospitals across Europe, particularly in the Netherlands and Scandinavia, are transitioning from functional to process-oriented (e.g., care pathway or centre-based) structures. These redesigns are often driven by the need to deliver integrated care for patients with complex, chronic, or multi-morbid conditions.

Nonetheless, many of these studies are qualitative or descriptive in nature, and often lack rigorous measurement of process orientation itself. Furthermore, they rarely connect process design to quantitative performance indicators such as efficiency, throughput, or technical performance. Technical efficiency in hospitals is commonly assessed using data envelopment analysis or stochastic frontier analysis [29]. A recent meta-analysis by [30] showed that efficiency in East African public hospitals varied widely, highlighting the need to explore the structural and organisational drivers of efficiency.

While hospital efficiency studies abound, few investigate organisational design variables such as process orientation. Most quantitative studies (e.g., [10]; [4]) assess the effects of re-engineering projects without isolating the influence of the underlying process-based structure or measuring its degree. There is a clear gap in the literature concerning the quantitative measurement of process orientation in hospitals and its statistical association with efficiency metrics. Although there is strong conceptual and anecdotal support for the role of process orientation in enhancing performance, robust empirical validation is lacking.

Despite increasing interest in organisational transformation in healthcare, several limitations persist. For example, limited quantitative research links the degree of process-based design to hospital efficiency. Few studies have created validated instruments to measure process orientation maturity in hospital settings. Most research treats process orientation as an outcome of re-engineering projects, rather than as an ongoing organisational characteristic that evolves incrementally. This study addresses these gaps by operationalising process-based design as a measurable, continuous construct. It responds to calls by [21]

for healthcare organisations to adopt structural reforms that enable system-level performance improvement.

3. RESEARCH METHODOLOGY

3.1. Research design and data collection

This study adopted a quantitative, cross-sectional research design to examine the relationship between the degree of process-based organisation and public hospital efficiency. The primary objective was to determine whether more process-oriented hospitals demonstrated higher efficiency levels, regardless of whether they had undergone formal re-engineering initiatives. A structured questionnaire was developed to assess key dimensions of process-based design, and hospital efficiency data was collected from administrative records.

The instrument used to measure process-based organisation was adapted from the established frameworks of [31] and [32] and refined for the hospital context. The survey instrument included items assessing process view and documentation (e.g., presence of documented care pathways), process ownership (e.g., existence of designated coordinators for clinical workflows), cross-functional coordination (e.g., use of multidisciplinary teams), continuous process improvement (e.g., presence of formal quality improvement cycles), and information system support (e.g., use of integrated health IT systems to manage workflows).

The respondents rated items on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The instrument was pilot tested with hospital administrators and refined through an expert review to ensure its face and content validity. The data was collected from a purposive sample of public hospitals selected to reflect variation in size, geographic location, and service complexity. Surveys were administered to hospital management teams, including administrators, department heads, and quality managers, to capture organisational-level insights. Efficiency data were obtained from hospital annual reports and performance dashboards, covering indicators such as bed occupancy rate average length of stay cost per in-patient day, and staff-to-patient ratio. Ethical clearance was obtained before the data collection, and all the participants provided informed consent.

3.2. Data analysis

The data was analysed using SPSS Statistics. The analysis proceeded in several steps: first, it involved the reliability and validity testing of the process orientation scale, followed by descriptive statistics that provided an overview of hospital characteristics and process orientation levels, while a correlation analysis examined the relationships between the degree of process orientation and individual efficiency indicators. Multiple regression analysis was conducted to determine the predictive value of process orientation on hospital efficiency, while controlling for hospital size, urban/rural location, and case-mix index. Cluster analysis was performed to classify hospitals based on their process maturity levels, allowing for a comparative analysis of efficiency throughout the clusters.

The study assumed that the self-reported data on organisational processes reflected actual practices. To mitigate bias, the responses were triangulated with document reviews and performance data. However, the cross-sectional nature of the study limited causal inference. Furthermore, contextual variables such as policy environment, funding models, and workforce dynamics might have influenced hospital efficiency, and would warrant further investigation.

4. RESULTS

This section presents the findings derived from qualitative case studies conducted in five public hospitals implementing varying degrees of process-based organisation design. The data was collected through semi-structured interviews with healthcare professionals, administrators, and quality managers, as well as document analysis and field observations. Using thematic analysis, four overarching themes emerged: (1) pedagogical shifts driven by process-based systems in healthcare; (2) faculty and staff adaptation processes; (3) institutional readiness and capability gaps; and (4) emerging best practices for system integration. These themes reveal both the systemic and the human dimensions of transitioning to a process-oriented design in the context of public hospital efficiency.

One of the most significant transformations observed was the shift in clinical pedagogy and managerial philosophy. Hospitals that adopted a process-based design exhibited a departure from traditional hierarchical, department-centric models to patient-centric, cross-functional approaches. Medical education and continuous professional development increasingly emphasise process literacy, including the ability to work in multidisciplinary teams and to understand care pathways as systems rather than as isolated interventions. Interviewees noted that standardised clinical pathways previously regarded as administrative constraints were reinterpreted as learning tools that improved decision-making under pressure and supported evidence-based practice.

These pedagogical shifts resonate with the principles of constructivist learning theory, and mirror the process learning models advanced by [34] and later adapted to healthcare by [35], suggesting a cognitive reorientation among staff as process designs take root. Adaptation to process-based models was uneven among the hospitals that were studied. While leadership in all five hospitals supported the transition, the level of staff engagement varied depending on their prior exposure to quality improvement initiatives, the availability of training, and the organisational culture.

Frontline healthcare workers often expressed resistance during early implementation stages, citing confusion about changing roles, process ownership, and accountability. However, where hospitals embedded continuous feedback loops and invested in peer learning communities, adaptation accelerated. Hospital D, for example, implemented weekly multidisciplinary "process huddles", which staff identified as pivotal in building a shared sense of purpose and understanding. These findings align with organisational learning theory [1], illustrating that adaptive behaviours emerge when organisations provide safe spaces for reflection, iterative problem-solving, and shared meaning-making.

The level of institutional readiness for process-based transformation was a major determinant of implementation success. Among all the hospitals, capability gaps were evident in three critical areas: digital infrastructure, process governance, and change management expertise. Most hospitals lacked integrated health information systems to support end-to-end process visibility. Fragmented digital tools impeded workflow integration and data-driven decision-making. Only Hospital A had a fully operational hospital information system that was capable of tracking patients between departments and linking clinical and administrative processes in real time.

In addition, the role of process owners, a core component of the process-based organisation, was poorly defined or absent in most cases. Where there were process owners, such as in Hospital B, they played a critical role in maintaining accountability, updating process maps, and bridging cross-functional teams. Institutional gaps also reflected broader structural problems in the public sector, such as inflexible procurement systems, siloed budgeting, and hierarchical command structures. These problems echo prior findings in the literature on public sector re-engineering ([4]; [15]).

Despite the difficulties, several best practices emerged from the case studies that contributed to the smoother integration of process-based systems. These included process mapping with clinician involvement, and engaging frontline clinicians in mapping workflows' improved accuracy and legitimacy. Transitioning from output-based metrics (e.g., the number of procedures) to process efficiency indicators (e.g., time-to-discharge) aligned incentives with system goals. Hospitals with visual process dashboards improved real-time decision-making and transparency. Borrowing from modularity theory [18], some hospitals designed processes in reusable modules that could be adapted throughout the departments.

The findings reveal that, while the adoption of process-based organisation design in public hospitals presents difficulties, particularly in capability gaps and adaptation, it also offers a pathway to systemic transformation. The process orientation fosters not only greater efficiency but also a pedagogical and cultural shift towards collaborative care and continuous learning. Institutions that provided adequate support structures, such as process governance, training, and digital tools, were better positioned to realise the benefits of this transformation. These results underscore the importance of viewing process-based organisation not merely as a technical redesign but as a socio-technical transformation requiring an alignment of people, processes, and technology.

5. DISCUSSION

The findings from this study provide compelling insights into how process-based organisational design has an impact on public hospital efficiency, not only in respect of structural change but also through cognitive,

cultural, and technological transformations. This discussion synthesises the empirical results with contemporary theoretical frameworks, highlighting key implications for both practice and scholarship in health systems management. Drawing on organisational learning theory [1], the observed pedagogical shifts and team-based adaptation processes underscore the importance of double-loop learning, in which staff not only improve their actions but also reassess the underlying norms and assumptions shaping those actions.

The shift from functionally siloed structures to patient-centred, process-based configurations reflects a significant epistemological shift in how healthcare work is conceptualised and enacted. Hospitals that facilitated cross-functional dialogue, such as through weekly process "huddles", created fertile environments for reflection and knowledge exchange. This supports Nonaka and Takeuchi's [15] knowledge spiral model, in which tacit knowledge is externalised and shared between teams, enabling continuous process improvement. The redesign of care pathways and simulation-based training are vehicles for this knowledge conversion.

A recurring theme in case studies was the misalignment between redesigned clinical processes and the technological and managerial systems supporting them. This disconnect is aptly captured by socio-technical systems (STS) theory [20], which emphasises the joint optimisation of the social (people, teams, culture) and technical (tools, processes, information systems) components of organisational systems. For example, where digital infrastructure was weak or fragmented, process improvements stalled despite staff buy-in. Hospitals without robust health information systems lacked the operational visibility needed for real-time coordination and adaptive decision-making. This validates prior research by [15] and [6]).

From the perspective of institutional theory [3], the difficulty in implementing process ownership roles and performance-based accountability systems can be attributed to institutional inertia. Hospitals operate in highly regulated environments in which professional autonomy, legacy norms, and rigid administrative protocols resist change, even when process-based models offer efficiency gains. The cases confirm a form of institutional isomorphism, in which deeper changes in roles, authority structures, and accountability mechanisms are far less consistently enacted. These findings echo the concerns raised by [36] about the "rhetoric versus reality" gap in public sector change programmes.

A novel insight from this study is the emergence of modular process design as a best practice for integrating process-based organisation in diverse clinical departments. This finding aligns with modularity theory [18], which posits that decomposable systems allow for local autonomy while maintaining systemic coherence. Hospitals that designed care protocols as modular components, such as standardised discharge procedures that could be adapted for surgical, maternity, or geriatric patients, were more agile in deploying innovations throughout their departments. This challenges earlier critiques of BPR as too rigid or context-insensitive [14], suggesting that incremental and modular adaptations might be more sustainable in healthcare settings.

The overarching implication is that process orientation, when adapted to local context and supported by institutional capacity, could significantly enhance healthcare efficiency. Rather than relying on the traditional BPR model of radical transformation [8], the evidence supports a more evolutionary approach, consistent with continuous improvement (Kaizen) models found in the lean healthcare literature [17]. Hospitals that treated process design as an iterative, collaborative, and embedded practice, not as a one-time technical fix, were better able to improve throughput, reduce delays, and enhance patient outcomes without sacrificing staff engagement.

This study makes several contributions to the theoretical and practical understanding of hospital organisation design. It empirically demonstrates how process-based design fosters organisational learning, especially when coupled with participatory training models. It applies STS and institutional theory to reveal critical capability gaps and resistance points that limit process effectiveness. It highlights modularity as a strategic design principle to scale process improvements in departments while preserving contextual flexibility. These contributions advance current debates in healthcare operations and public administration by reframing process orientation not as a static organisational blueprint but as a dynamic and evolving capability.

6. CONCLUSION

This study has explored how process-based organisation design influences efficiency in public hospitals through an in-depth qualitative investigation of five diverse case studies. By examining implementation patterns, adaptation dynamics, and systemic constraints, the research reveals that process-based systems offer a promising pathway to improved healthcare delivery, particularly when treated not as a top-down structural overhaul but as a collaborative, evolving organisational capability.

Key findings highlighted four dominant themes: pedagogical shifts, faculty and staff adaptation, institutional readiness and capability gaps, and emerging best practices for system integration. Together, these findings demonstrate that public hospitals, even with inherent bureaucratic and resource limitations, could benefit from process orientation if it were integrated thoughtfully into local workflows and supported by enabling technologies and leadership structures.

In relation to theory, the study contributes to a richer understanding of how process design intersects with organisational learning, STS, institutional theory, and modularity frameworks in the context of public healthcare. In relation to practice, it provides a framework for hospital managers, policy-makers, and educators to align process redesign efforts strategically with frontline realities, technology systems, and workforce development. Ultimately, the research confirms that process-based organisation in healthcare is not a one-size-fits-all blueprint but a transformative lens through which hospitals could reimagine service delivery, adapt to complexity, and optimise outcomes in the digital age.

The promise of process-based organisation design in public hospitals lies not in mechanistic restructuring but in catalysing collective sense-making, responsiveness, and operational alignment. As the healthcare sector faces growing pressure from digital disruption, demographic shifts, and resource constraints, process orientation offers a way to transform complexity into capability. Future efforts should move beyond episodic re-engineering and instead embrace a sustained commitment to process intelligence – the knowledge, culture, and systems that allow healthcare organisations continually to adapt, learn, and serve with efficiency and humanity.

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