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Lean Thinking and Resource Efficiency in the Design of Public Services

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Abstract

Efficiency in public service organisations is often driven by the need to reduce costs and increase productivity due to the economic and government pressure to make the best use of reduced resources. However, efficiency in public services can go beyond cost cutting, thinking about how organisations design and deliver their service offerings to achieve better outcomes while using the government fund more efficiently to turn public money into positive outcomes for both individuals and society. Through a combined method of literature review and interviews, the authors aim to systematically collect and analyse existing contributions on the current public services design and how Lean Thinking can promote resource efficiency in public service organisations, followed by validating the results through interviews in different public organisations focusing on the role of human resources in the services design. The findings suggest that implementing Lean Thinking allows public service organisations to streamline their resource allocation, eliminate waste, and improve productivity, resulting in more efficient service delivery, user satisfaction, and improved organisational performance. The authors took a panoramic view across different public organisation types, which can be extended through future research on specific organisation types or different regions to explore unique dimensions and find relevant conclusions.

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Keywords: Lean Thinking; Service Design; Public Service Organisation; Public Services; Efficiency

1. Introduction

Governments worldwide developed the need to deliver better education, healthcare, and other public services while using the overall budget more efficiently [1,2]. Because public service organisations (PSOs) strategies are directly affected and controlled by the government's policies and needs [2], this increased the pressure on PSOs to improve their productivity and performance by improving their services more efficiently and effectively [3]. Measuring efficiency in PSOs is obtained by using a given level of resources for the maximum outcome while still focusing on the effectiveness of their outcomes [4].

Nomenclature

PSO	Public Service Organisation
PDA	Product-Dominant Approach
SDA	Service-Dominant Approach

Attaining nonrenewable resources is more difficult nowadays due to the growth in the world's population [5], which puts pressure on governments to address environmental, economic, and social sustainability as a top priority [5]. This growing pressure has also caused PSOs to focus their performance on resource efficiency [6] while delivering efficient and effective services to their users [7]. PSOs contribute to more than 50% of the gross domestic product of top economies [8]. The pressure to keep pace with the higher and changing user expectations increased the need for PSOs to adopt management and performance improvement tools from the manufacturing industry, such as Lean methodologies, to achieve cost savings and quality improvement [1,9].

From its origin in the automotive industry, Lean Thinking is increasingly seen as a solution to efficiency and quality problems in other industries [10]. PSOs managers are starting to focus on implementing Lean methodologies as a way to do more with less [8]; however, they should understand that Lean is not about cutting staff and resources [11], but it is a cultural

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transformation philosophy that changes how an organisation works [8]. Lean Thinking is a philosophy that enhances customers' perceived value by continuously removing non-value activities and focuses on five elements: value definition, value stream mapping, continuous flow, applying a pull approach based on customers' demands, and the aim for perfection [11,10], and often perceived as a combination of good operations and effective people management that enables organisations to improve their performance and increase their efficiency [12].

2. Efficiency and Effectiveness Conceptual Framework

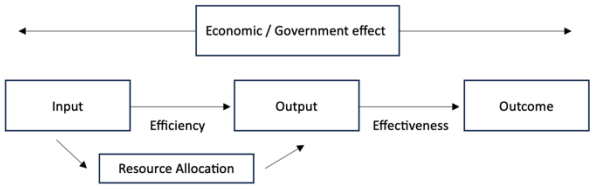


Fig. 1. Source: Directorate-General for Economic and Financial Affairs [13]

Expanding the conceptual framework of efficiency and effectiveness from Arpaia and Turrini [13], which focused on increasing the effectiveness of public services as a key variable in evaluating the performance of PSOs, and aims to increase the efficiency and value for money of public expenditures and limited public resources. We tested the variables proposed by Arpaia and Turrini [13] and their relationships in the literature, and considering the similarity of their aim and our research aim, we chose to expand their framework, as shown in Fig.1. to incorporate new perspectives and relationships between the variables by not focusing only on the economic value of the PSOs outcomes, but also on the user's value, effective resource allocation, and sustainable organisational performance.

Fig. 1. shows that public services outcomes (performance and productivity) imply a relationship between inputs (budget and resources) controlled by the economic and government effect and supplied by the government, which leads to the limitation of PSOs' resources and budget and affects their strategies of resource allocation to correlate with the pressure to increase productivity and flexibility of adapting to global and government demands. The authors mapped efficiency and resource allocation in the public service process in two dimensions (efficiency of input and efficiency of output) to focus on efficient resource allocation, effective outcomes, and public service development. This approach helps avoid the old PSOs' response to economic and government pressure and cost-cutting demands and focuses on establishing an effective performance-oriented system in designing and developing public services.

From a Lean Thinking lens and SDA, the authors focused on the users' value by studying their role as service co-producers and how this focus guides the resource allocation in the design and development process. The authors also focused on human capital as the main resource in PSOs by studying the relationship between employees' levels and service user experience, and their role in improving the quality and effectiveness of public service delivery.

3. Literature Review

This research aims to systematically collect and analyse existing knowledge on the public service process and how Lean Thinking can promote resource efficiency by focusing on the role of human resources. Multiple databases, including Scopus and Science Direct, were searched using the keywords "Resource Efficiency", "Public Services", "Lean Services", and "Lean Thinking". The search included articles published between (2000-2023). Using the framework in Fig. 1. the authors mapped the public services process and developed themes from the literature.

3.1. Economic and Government Effect

Economic systems strongly influence government dynamics [4] and affect their short and long-term decisions and regulations within their inter-organisational system, including PSOs [14]. There is pressure on PSOs to make the best use of their limited resources [15], adjust to budget constraints [16], and stay responsive to uncertainties and changes through short and long-term planning and strategies [17] while meeting government requirements to improve productivity, delivering high-quality services, meeting user expectations [15], and remaining in pursuit to achieve public value [18].

Although cost-cutting is usually associated with how PSOs respond to economic and resource efficiency challenges, establishing a result-oriented performance system enables them to allocate their resources more efficiently [19]. The more efficient the allocation of resources is, the more flexible and effective the public service development [3], while a more user-focused culture and performance-based budgeting help PSOs respond to public needs and social changes and remain focused on achieving their long-term goals [22].

3.2. Service User as a Co-producer

The impact of social and governance rules on the process of value creation and service outcomes in PSOs has led to the shift from product-dominant approach (PDA) [22] where the focus is on the efficiency of internal processes without looking at its impact or outcomes [7], to service-dominant approach (SDA) which focuses on the service user in the design and development of public services [23] and consider the impact of service design and delivery on public value creation and service outcomes [22]. The SDA was introduced by Vargo and Lusch [24] as a new service perspective which argues that value is co-created along the service process. This focus brings the roles of different stakeholders in the public service system [25]. It leads to co-creating knowledge and innovation, which help set indicators for organisational performance [26].

The service co-creation approach indicates that service value is created through the interaction between service providers and service users through the service design and delivery processes [3]. This interaction is essential in evaluating users' needs, expectations, and perceived value and has a direct impact on service quality and improvement, user experience, and the organisation's performance system [25].

3.3. Service Design

Understanding users' expectations is crucial in designing and delivering public services [23]. Users usually expect a service to be "fit for purpose"; they base their judgment on their expectations and service delivery experience; this experience affects the outcomes and effectiveness of these services [23].

Adopting SDA draws the attention of service users as key stakeholders in the public service system [23]; it carries through user engagement along service development phases including, planning, design, managing, delivery, monitoring, and evaluation [27], emphasising the need and importance of effective service management and the role of knowledge and innovation along the service system [6]. This knowledge assists in analysing the service users and their value perception [27]. Knowing who the service users are, their needs, expectations, and perceived value are some of the key elements that affect the levels of services when designing public service offerings and experience [24,6]. Effective service management emphasises the need to apply specialised skills and experience within SDA to drive service activities and production through knowledge and skills rather than units of output [23]. Which then examines the effectiveness of service outputs and outcomes through understanding the user experience and identifying critical incidents or interactions within the user journey [28]. The quality of these interactions affects the long-term relationship with service users [6], service quality, and user satisfaction [3], which yields more sustainable PSOs [6].

The management model driven by PDA tended to respond to economic and government pressure by focusing on internal cost-cutting [6]. Although this approach led to more efficient internal processes, it did not extend to effective services [7], achieving user satisfaction, and long-term sustainable services [24,6]. In PSOs, focusing on internal efficiency by, for example, reducing human capital costs can negatively affect service user experience and the effectiveness of these services [23]. Studies argue that effective human resources practices can positively impact service efficiency and effectiveness and reach a higher level of service quality [12,31].

From a service design perspective, users do not experience the complete service system but rather engage in specific "touchpoints"; these touchpoints form the user journey, simultaneously developing the user service experience [28]. This perspective drives the focus on the user as a co-producer in the service system. It emphasises the importance of knowledge in resource allocation and transfers it to a service experience [30], aligning it with the strategic objectives of PSOs and the user value [28]. Due to the budget constraints and limited resources of PSOs [20] and as it is not possible to pre-define service outcomes and create user value until the user integrates with the service provider [31], prioritising resource allocation to the user touchpoints [32] helps link resource allocation to public organisations' goals and performance, and therefore increase its efficiency and effectiveness [20].

3.4. The Role of Human Capital

PSOs are considered the largest employer in any economy [2], and their key resource is their human capital [29]. Although selecting and recruiting highly skilled employees is crucial to PSOs' success [34,35], government control over recruitment strategies and budgets in PSOs limits their control over the recruitment and development of their employees [29].

Because of the intangible nature of services, employees' interactions and behaviours with service users affect how the users evaluate the service quality and, therefore, affect their satisfaction [34]. Customer experience is often defined as the quality of the employee-user interaction [34]. It is important to recruit employees who can think and act from a user-centric perspective and align their performance with the organisation's objectives to build a quality workforce [37,31]. Therefore, PSOs should develop the ability to attract and retain highly skilled employees and engage them in continuous development and improvement while keeping them motivated to achieve the organisation's strategic objectives [38,31]. Employees' motivation and job satisfaction affect the relationship they build with service users and the quality of service delivery; the more empowered and motivated the employees are, the more they give service users individual attention [34]. Developing an employee empowerment culture enhances their motivation to meet users' needs and expectations [34]. It reduces employee turnover, positively affecting organisational performance and leading to more efficient public services [29].

3.5. Productivity and Performance

The economic and government pressure has raised the need to increase resource efficiency and productivity and develop sustainable performance management systems across the public service sector [36,27]. Performance management in any organisation should be directed and related to its long-term goals and strategies, meeting users' expectations and perceived value in the context of PSOs [3]. Considering the significance of its size, activities, employees, and utilised resources, integrating environmental, economic, and social sustainable performance practices is crucial in the public service sector [39,40]. However, researchers agree that the integration of sustainable management and reporting systems in the public service sector is still challenging due to its intangible nature, the co-creation processes in service development and delivery [26], and the challenges of developing performance indicators that define and reflect value in PSOs [19].

Service productivity can be defined as the function of internal efficiency, external efficiency, and the ability to turn resources into high-quality services through efficient and effective processes [20]. Considering that co-production and user value are the heart of public services and the key source for effective outcomes, performance, and innovation [23], PSOs' focus should be on external efficiency and the ability to create sustainable value for their users [6]. SDA drives the focus on external efficiency and user value where knowledge and skills are important rather than the internal efficiency or units of output [6], as well as driving mutual learning based on co-production, which leads to innovation, continued service improvement, and developing more sustainable business practices and indicators [28]. A continuous improvement approach focusing on effective service development develops a better view for PSOs in their design of performance management systems [35]. Systems based on indicators support the decision-making and response to global and government trends [26]; Ramos argues that sustainable

performance indicators in PSOs should integrate the effectiveness of service outcomes, the co-creation of user value with the overall sustainability measurements against the triple bottom line environmental, economic, and social sustainability. Introducing a scheme of resource efficiency, sustainable processes and services, and a reporting system is crucial for PSOs to become more sustainable [37].

4. Efficient and Effective Service Development

One of the commonly used approaches in the literature to address resource efficiency in PSOs is Data Envelopment Analysis (DEA), which is a mathematical methodology used to measure the relative efficiency of decision-making units (DMUs) based on their inputs and outputs [40,41]. Although this approach can measure internal processes and resource efficiency based on service inputs and outputs, it does not serve the aim of effective public service outcomes of service user satisfaction and sustainable performance. In this research, the authors took a different approach to fill this gap by focusing on exploring not only the internal efficiency of PSOs but also their outcomes through Lean Thinking methodology to extend the effectiveness of these outcomes by focusing on the user value and sustainable organisational performance and by linking the resource allocation to performance results.

5. Methodology

Following a thematic analysis of the literature using the themes shown in Table 1. we arrived at several indicators to analyse each theme with a Lean Thinking lens. Semi-structured interview questions were constructed based on the indicators related to each of the themes in Table 1. below:

Table 1. Interview Questions

Economic / Government effect	
Indicators	Economic pressure, Government demands, Government regulations, Compliance, Limited resources, Budget constraints, Service quality, User-centric, User experience
Q.1 How does your organisation balance the need to be flexible and responsive to government legislations and agendas while remaining able to achieve its long-term goals and performance?	
Service user as a co-producer	
Indicators	Service co-creation, User expectations, User experience, User centric, User value, Feedback
Q2. How do you ensure that the development of new services aligns with your organisation's strategies, goals, and regulatory requirements?	
Service design	
Indicators	Stakeholders' identification, User-centric, User journey, User expectations, User interaction, User experience, Feedback, User value, Service quality, Service offerings, Service co-creation
Q3. How would you describe the process of better understanding your service users and meeting their requirements or expectations?	
Indicators	Stakeholders' identification, User-centric, User journey, User expectations, User interaction, User experience, Feedback, Continuous improvement, Resource allocation, Resource efficiency, User value, Service quality, Service offerings, Limited resources, Service co-creation, Budget constraints
Q4. How do you balance resource efficiency and maintaining high-quality services outcomes in the design/ development of your services?	
The role of human capital	
Indicators	Recruitment strategy, Control over the recruitment process, Government regulations, Budget constraints, Right staffing, User experience, Limited resources, Employee level, User-centric cultural, Training/Empowering, Service quality
Q5. How does the human capital levels affect service user experience? and what role do they play in improving your service quality and delivery?	
Productivity and performance	
Indicators	Sustainable performance, Performance management, Performance indicators, Service offerings, Service quality, Efficiency, Effectiveness, Compliance, Adaptability, User experience, User centric
Q6. How does your organisation measure, evaluate, and report the effectiveness of its service system in relation with its organisational sustainable performance?	

The interviews were conducted with three relevant experts from different PSOs in the United Arab Emirates (Table 2.). The sampling technique used in selecting the interviewees was Purposive Sampling; this technique serves the need to select interviewees who can provide valuable insights and the right answers for this research and interview questions.

Table 2. Interviewees Details

Number	*Role*	*Organisation*
1	Corporate Quality and Operational Excellence Consultant	Dubai Health Authority
2	Head of Organisational Support services	Abu Dhabi Department of Health
3	Strategic Planning Manager	Sharjah Environment and Protected Areas Authority

Interview answers were recorded, transcribed into text, and coded via NVIVO according to the themes and indicators in Table 1. The occurrence of each indicator in the interview answers was analysed and compared to its mention in the literature to validate and compare the results from the literature with the results from PSO stakeholders and explore their views, experiences, and motivations.

6. Results and Discussion

Following the same thematic analysis from the literature, the authors analysed the interview results based on the output related to each theme to compare what we know to the actual practices in PSOs.

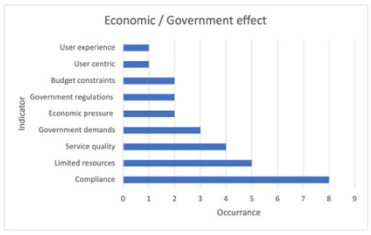


Fig. 2. Economic / Government Effect

In Fig. 2, the compliance indicator and staying responsive to government legislation scored the highest occurrence. However, there is less focus on the user, which raises the question of to what extent governments can respond to the pursuit of users' value and catalyse PSOs to focus on what is suitable for the public.

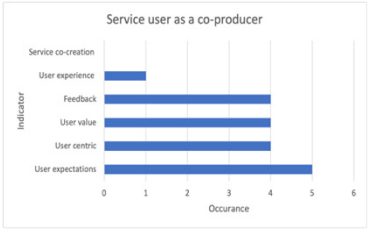


Fig. 3. Service User as a Co-producer

In Fig. 3, user expectations, user-centric, user value, and feedback indicators scored high occurrence when ensuring the alignment of public service development with the strategies

and regulatory requirements. These results align with the focus on the effectiveness of public service outcomes and user value. However, from SDA, user value is co-created along the service process development, which is essential in evaluating the users' expectations and perceived value and directly impacts the service quality, user experience, and PSO performance.

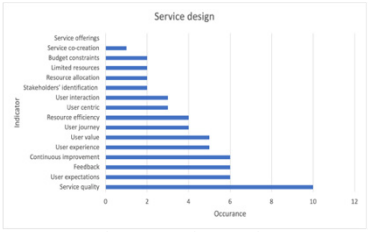


Fig. 4. Service Design

In Fig. 4. the interview results focused on maintaining high-quality service outcomes in the design and development of public services by meeting user's expectations, acquiring feedback, and focusing on continuous improvement. From the interviews, the authors noticed that understanding user needs and expectations and optimising resource allocation to produce high-quality service outcomes were mainly assessed through conducting market research using different data-gathering techniques to help PSOs create their user journey and tailor their services to high-quality outcomes.

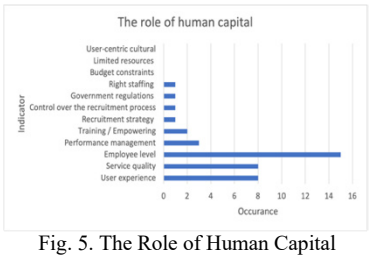


Fig. 5. The Role of Human Capital

In Fig. 5, the interview results emphasised the importance of employee level in achieving high-quality service outcomes and improving user experience. Although there was a lack of implementation of a user-centric culture, the interviewees mentioned that competent and skilled employees are more capable of understanding users' needs and delivering the services effectively and are more equipped to provide excellent customer service and enhance the overall user experience. Also, they mentioned that aligning employees' performance indicators with the organisational performance creates a cohesive work environment where employees' efforts are directed towards achieving the organisational goals, leading to improved organisational performance and service quality.



Fig. 6. Productivity and Performance

The results in Fig. 6. show the importance of implementing performance indicators to measure and evaluate the effectiveness of service outcomes. These indicators help identify trends, patterns, gaps, and areas for improvement, which contribute to more informed decision-making and resource allocation. These indicators are evaluated periodically and annually based on the strategic goals and government's agendas, including addressing sustainability challenges. From SD and user-centric approaches, PSOs should direct their productivity and performance indicators to meet their service users' needs, expectations, and perceived value to achieve effective outcomes and sustainable performance.

The literature review and interview results emphasise the need to implement performance management strategies in PSOs to maximise the effectiveness of given resources and minimise the effect of the current challenges and, therefore, the effect on service quality. Lean methodology eliminates activities that do not add value to the user, thus maximising the efficiency and effectiveness of resource utilisations [41]. Value-added activities in PSOs are defined as the activities the user is willing to pay for; anything else is defined as "waste" [11]. Adopting Lean Thinking in PSOs integrates the users' participation in service development by being a value-creation partner [10]. It links the service quality between users' expectations, perception of service output, and the overall service experience [10].

The results show a focus on the importance of human capital in the development of public services. However, there is a clear need for an effective management strategy for this focus to be influential. A key principle in Lean Thinking is the employees' empowerment and involvement in the continuous improvement process [41]. Researchers suggest that when combined with continuous improvement strategies, human resources practices such as training, empowerment, and involvement in decision-making can positively impact delivering higher service quality [12]. Applying Lean Thinking to service development can generate higher performance results and improve employee behaviours, streamlining PSOs' resource allocation and productivity [8,12].

7. Conclusion, limitations, and future research

Focusing on how PSOs design and deliver their service offerings to achieve effective outcomes of high-quality service, this research explored the implementation of Lean Thinking across public service design and development processes to fill the gap of the old approach of focusing on the internal efficiency of service inputs and outputs. From SD and user-centric approach, the authors extended a conceptual framework and studied the service process variables and their relationships by developing different themes and indicators to analyse existing knowledge in the literature and real-life views through interviews with relative expertise. The interview results showed a lack of focus on the user across all themes, emphasising the need for an effective management approach that leads the design of public services and develops more user-centric and sustainable performance development systems. The authors suggest that implementing Lean Thinking allows PSOs to allocate their resources more efficiently and effectively and improve productivity, resulting in higher quality service delivery, user satisfaction, and sustainable organisational performance. Research limitations included the restricted number of interviews due to the lack of response from other PSO stakeholders, resulting in limited views on PSOs' practices and strategies. Future research can focus on studying

different PSO types separately and tailoring the implementation of Lean Thinking to their unique characteristics and requirements.

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