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Assessing Efficiency in State Universities: Evidence from the Analytical Hierarchy Process

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Abstract

The introduction of agencification in state universities, marked by the provision of varying degrees of autonomy, aims to improve service quality and operational efficiency. This study investigates the efficiency of state universities through the lens of agencification, i.e., the use of semi-autonomous or autonomous agencies to deliver public services. The Analytical Hierarchy Process is employed to identify and prioritize key criteria influencing university performance. Drawing on semi-structured interviews and focus group discussions with university managers, policymakers, and academics, we reveal twelve critical factors that contribute to efficiency. The findings reveal an urgent need for innovation across leadership, human resource management, information technology, strategic planning, and governance. The findings highlight the role of visionary leadership, effective human resource management, and stringent internal controls as the dominant criteria. We explore the challenges faced by state universities, including the complexities of autonomy models and bureaucratic constraints. The results imply that while university autonomy can enhance operational efficiency, it must be balanced with accountability mechanisms to prevent disparities. This research contributes to the efficiency scholarship by explaining actionable insights for policymakers and university managers to improve service quality in contemporary governance frameworks.

Keywords: agencification, analytical hierarchy process, efficiency, state universities, university autonomy

INTRODUCTION

The New Public Management (NPM) doctrines promote agencification as a strategy to increase efficiency (Vining et al., 2015, p.195). Agencification refers to establishing semi-autonomous agencies that operate at arm's length of

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the government to carry out public tasks, such as services, policy implementation, or regulation (Van Thiel, 2011). In the context of higher education, agencification has been employed to grant state universities with varying degrees of autonomy to improve their performance. However, the effectiveness of university autonomy under the auspices of NPM doctrines remains unclear. While proponents contend that autonomy enhances efficiency, critics argue its applicability in attaining sustainable outcomes (Bolli et al., 2016).

The NPM doctrines assume that task specialization of public sector organizations will result in efficiency (Lægreid & Verhoest, 2010, p.1). Therefore, agencification emphasizes operational efficiency and revenue generation (Bertelli, 2006, p.232). Efficiency is essential for universities in the context of competition and productivity. A study by Izadi et al. (2002) concluded that the majority of universities in the UK are efficient, with Oxford, Cambridge, and Sheffield among the top three. Bolli et al. (2016) contend that although bureaucracy burdens university funding procedures with administrative tasks, control mechanisms force universities to increase efficiency.

University autonomy, characterized by the capacity of institutions to make their own choices regarding governance, financial, and human resource matters, is fundamental to contemporary higher education reform. Research emphasizes many aspects of autonomy—academic, financial, organizational, and staffing—that affect the efficiency of universities (Witte & López-Torres, 2017). Nonetheless, the effectiveness of autonomy is contingent upon context, exhibiting varied evidence across different countries. For example, Autonomy in Japan and Korea has demonstrated positive effects on some performance metrics; nevertheless, research in European contexts indicates difficulties in linking autonomy with measurable outcomes (Yamamoto, 2006; Overman & Van Thiel, 2016). This prompts essential inquiries about the implementation of autonomy and its connection with governance frameworks, especially in developing nations such as Indonesia.

University autonomy is a fundamental aspect of higher education reform, defined by the ability of universities to independently determine policies related to academic governance, finance, human resources, and organizational matters. The dimensions of autonomy are frequently influenced by broader governance frameworks and regulatory environments (Van Thiel, 2011; Witte & López-Torres, 2017). Financial and human resources autonomy can enhance efficiency; however, excessive autonomy without strong accountability mechanisms may lead to disparities and inefficiencies (Bolli et al., 2016).

Autonomy fosters innovation and improved performance in service delivery in universities (Kantabutra & Tang, 2010). Granting greater autonomy to universities is linked to significant improvements in institutional productivity and innovation capacity (Hieu & Niem, 2024). It allows them to engage in more proactive strategic planning and achieve better outcomes in education quality and research innovation (Al-Gharsi et al., 2024). However, formal autonomous status alone does not automatically improve research output or efficiency; rather, universities that actively utilize autonomy – for example, by adopting innovative staff management and internal governance practices – achieve higher publication rates and overall efficiency (Agasisti & Shibanova, 2021).

Agencification, which is closely linked to university autonomy, denotes the delegation of public responsibilities to semi-autonomous organizations that operate independently from governmental oversight. Following the wave of NPM, agencification has been implemented globally since the 1980s. The NPM doctrine suggests a form of government "agency" that provides public services with management inspired by the private sector. "Agency" operates within a distance from the government to carry out public tasks, implement policies, regulate markets and policies, or provide public services. This model, based on NPM principles, highlights operational efficiency, accountability, and performance-oriented management (Verhoest et al., 2012).

In different countries, agencies are translated into various governance patterns. The agency is expected to generate economic, political, and organizational impacts. To examine the economic impact, Overman & Van Thiel (2016) measure the effect of agencification in 20 countries. They conclude that it is challenging to relate agencification to outputs and outcomes (p.628). Kim & Cho (2014) found a significant relationship between human resources management autonomy and performance in 44 semi-autonomous agencies in Korea. Financial and human resources autonomy have a negative effect on the performance of these agencies. In contrast, control over outcomes positively affects performance (p.229). Meanwhile, Yamamoto (2006) concludes that the autonomy of operational management significantly impacts the performance perception of semi-autonomous agencies in Japan.

Autonomy minimizes the agency's hierarchy of responsibilities and gives managers greater policy discretion (p.41).

Regarding the effect of agencification on organizations, Wynen & Verhoest (2013) conclude that managerial autonomy has a positive effect on customer-oriented culture in 78 semi-autonomous bodies in Belgium. However, managerial autonomy does not make the culture dominant (p.356). Using interviews with nine agencies operating in Northern Ireland, Hyndman & Eden (2001) conclude that 'tightness' in planning and control systems in semi-autonomous institutions is lower than in other institutions (p.596). The impact of agencification was more pronounced and brought significant changes to the management and focus of the agency's activities (p.586).

Efficiency in higher education encompasses various dimensions, including resource utilization, quality of outcomes, and organizational performance. Stiglitz & Rosengard (2015) assert that, within the Pareto efficiency framework, efficiency is achieved when resources are allocated to maximize outputs without disadvantaging other stakeholders. Efficiency in public management represents a relatively recent paradigm, in contrast to traditional government agencies, which are often viewed as less efficient. Efficiency is essential in a dynamic environment characterized by limited resources, impacting both competition and productivity. Stiglitz & Rosenguard (2015) define efficiency as a state in which resource allocations guarantee that no individual can improve their situation without adversely affecting another individual. The concept of Pareto optimal efficiency indicates that in the presence of limited resources, enhancing one party's situation will reduce the resource availability for others. In the context of higher education, efficiency involves balancing economic, academic, and social objectives, often under resource constraints.

Pareto efficiency is achieved under two main conditions: (1) consumption efficiency, which occurs when consumers achieve maximum satisfaction at minimal cost, and (2) production efficiency, where producers deliver high-quality products while minimizing expenditure. Public organizations encounter a conflict between two frequently opposing objectives: efficiency and equity. Emphasizing efficiency may compromise equity, as initiatives to optimize resource utilization may undermine from objectives focused on reducing inequality. Conversely, an emphasis on equitable policies may result in a trade-off with efficiency, as resources are directed towards ensuring fairness instead of maximizing output.

Glendinning (1988) identifies three principles of value for money: economy, efficiency, and effectiveness. Efficiency is defined as the achievement of the highest possible output from available resources to meet designated requirements. Efficiency entails the optimization of output relative to specified inputs. Deloitte (2013) articulates this concept as “doing more for less”, highlighting the achievement of higher results with reduced effort or resources. Efficiency can be assessed using three comparative approaches: (1) analyzing the costs of an activity relative to its costs in the previous year, (2) benchmarking costs against those of comparable organizations, and (3) evaluating the costs of an activity in relation to the outcomes achieved from a particular level of expenditure.

A growing body of research investigates the factors influencing efficiency in universities, emphasizing the roles of leadership, human resources, and governance mechanisms as critical elements (Izadi et al., 2002; Mergoni & De Witte, 2022). Effective leadership is essential for aligning institutional objectives with stakeholder expectations, while strong human resource management guarantees that staff skills and competencies meet organizational needs. Technological advancements, particularly integrated information systems, are recognized as key factors enhancing efficiency by streamlining administrative processes and improving decision-making capabilities (Bolli et al., 2016).

Notwithstanding the substantial literature on efficiency in higher education, many gaps remain. Primarily, a significant portion of current research emphasizes operational efficiency in developed countries, while neglecting the distinct governance and regulatory frameworks of emerging economies. Secondly, although many studies investigate how universities attain efficiency, few examine the unique criteria and strategies that managers emphasize in semi-autonomous and non-autonomous universities. Ultimately, little emphasis has been directed into the implications of bureaucratic culture and the interplay between universities and their parent ministries in shaping efficiency outcomes.

This study aims to address these gaps by investigating the characteristics that influence efficiency at Indonesian state universities, characterized by varying levels of autonomy. The research employed the Analytical Hierarchy Process, a systematic decision-making technique, to identify and prioritize essential efficiency drivers, including

leadership, human resources, and internal control. The technique facilitates a detailed comprehension of how university administrators navigate the complexities of autonomy and regulation to improve institutional performance.

The present study is looking for answers to the following question: what are the criteria for assessing efficiency in state universities? This study enhances the wider discourse on efficiency in higher education by focusing on the Indonesian setting. It presents insights of the challenges and opportunities associated with agencification in developing nations and offers practical recommendations for policy makers and university managers. The findings seek to bridge the gap between theoretical discourse on university autonomy and the practical challenges of achieving efficiency in various governance contexts.

METHOD

This research employs the Analytical Hierarchy Process (AHP), a systematic decision-making framework established by Saaty (1982). AHP offers a structured approach for identifying and prioritizing options in complex decision-making contexts (Firdaus et al., 2011; Ghoni, 2018). Decision-making in personal and professional contexts frequently entails multiple criteria (Özcan et al., 2017). AHP addresses these issues by offering a method for quantifying intangible factors via pairwise comparisons on a scale of 1-9, thereby establishing priorities for the criteria. The AHP, as a mathematical model, is well-suited for assessing qualitative attributes and managing multiple criteria in multicriteria decision-making (Monga et al., 2021).

The AHP necessitates expert input to evaluate the significance of factors, facilitating a comprehensive understanding of the situation (Firdaus et al., 2011). Experts may encompass academics, regulators, industry associations, and practitioners (Laila, 2020). The AHP employs a hierarchical structure that organizes criteria and their corresponding sub-criteria within a layered framework (Ghoni, 2018). The advantages are: (1) a hierarchical structure that enables analysis from general criteria to specific sub-criteria; (2) the capacity to consider the validity of results within an acceptable tolerance for inconsistencies in the criteria and alternatives selected by decision-makers; and (3) strong and dependable output analysis, ensuring sustainable decision-making results.

The decision to employ AHP arises from its capacity to systematically address both qualitative and quantitative attributes. AHP distinguishes itself from other decision-making models by allowing researchers to integrate expert judgments within a mathematical framework, thereby offering a solid method for prioritizing criteria. This research employs AHP to identify and rank efficiency determinants according to their perceived relative importance among university managers, policymakers, and academics. The approach is suitable considering the study's emphasis on examining how stakeholders rank particular elements of efficiency in the context of Indonesian higher education.

The study collected data through a four-step process, incorporating a combination of literature review, focus group discussions (FGD), surveys, and interviews, adhering to the systematic procedures of the AHP (see Table 1).

Table 1. Data Collection

Step	Source	Data Collection Method
Designing a preliminary hierarchy structure	Literature, journals, and regulations related to state universities	Literature review
Validating the hierarchy structure	Regulators, operators, practitioners, and academics	FGD and interviews
Administering the survey	Regulators, operators, practitioners, and academics	Questionnaire
Confirming results and exploring strategies	Regulators, operators, practitioners, and academics	FGD

The study examined a sample of nine state universities in Indonesia, including autonomous universities (*Perguruan Tinggi Negeri Badan Hukum*, PTNBH), semi-autonomous universities (*Perguruan Tinggi Negeri Badan Layanan Umum*, PTN BLU), and non-autonomous universities (*Perguruan Tinggi Negeri*). The sample was chosen to capture variation across different types of institutional autonomy and governance structures. The participants included university managers, vice-chancellors, deans, finance officers, and representatives from the Ministry of Education. Table 2 provides an overview of the sample distribution and informant role.

The preliminary stage involved identifying critical efficiency factors via a comprehensive literature study. A focus group discussion involving

policymakers, university management, and experts was conducted to validate the preliminary efficiency elements. The hierarchical structure was amended based on the results of the FGD. A questionnaire was later created for experts to enable pairwise comparisons of the elements within the hierarchy of strategies to improve efficiency in state universities.

Table 2. Research Objects and Informants

University Code	Autonomy	Informant Role	Informant Code
A	Semi-autonomous	Vice Chancellor	A1
		Head of Bureau	A2
B	Semi-autonomous	Vice Chancellor	B1
		Dean	B2
C	Semi-autonomous	Vice Chancellor	C1
		Head of Internal Control	C2
		Head of Business Development Unit	C3
		Head of Planning and Budgeting	C4
D	Semi-autonomous	Vice Chancellor II	D1
		Financial Officer 1	D2
		Financial Officer 2	D3
		Financial Officer 3	D4
		Financial Officer 4	D5
		Financial Officer 5	D6
		Financial Officer 6	D7
E	Autonomous	Director of Finance	E1
		Secretary to the Directorate of Finance	E2
		Treasurer 1	E3
		Treasurer 2	E4
		Finance Coordinator	E5
		Treasurer Supervisor	E6
F	Non-autonomous	Deputy Director	F1
G	Non-autonomous	Vice Chancellor	G1
H	Non-autonomous	Deputy Director	H1
		Student Affairs Staff	H2
		Finance Officer 1	H3
		Treasurer 1	H4
		Finance Officer 2	H5
		Treasurer 2	H6
		Finance Officer 3	H7
I	Non-autonomous	Deputy Director	I1

The survey was administered following the completion of the revised hierarchical structure by all FGD participants. The survey participants were the same as those involved in the FGD. Data on comparisons among elements within the hierarchical structure were obtained through the survey. A geometric average was calculated from the responses, and a Comparison Pairwise Matrix (CPM) was developed. This step ensured the consistency of the comparative data obtained from each CPM. Results are presented in Appendix A.

Appendix A indicates that the comparison of elements at both the criteria and sub-criteria levels results in a Consistency Ratio (CR) that is below the threshold of 0.10. The requirements established by Firdaus et al. (2011) suggest that all respondents have offered consistent and reliable opinions. Consequently, expert opinions can be utilized in subsequent stages of analysis.

We validated the results in the second FGD to confirm findings and enhance the hierarchical structure for assessing efficiency in state universities. This FGD enables experts to suggest improvements to the hierarchy, establishing a solid framework for evaluating efficiency, as outlined in Table 3.

Table 3. Result Confirmation from FGD

Organization	Participant Role
University A	Planning Staff
University D	Rector
University E	Secretary to the Directorate of Finance and Treasury
University E	Lecturer and Treasury Coordinator
The Ministry of Education	Coordinator, Sub-Directorate of Institutional Arrangement for Academic Higher Education
The Ministry of Education	Coordinator, Sub-Directorate of Academic Higher Education Institutional Development
-	Academic Expert

RESULT AND DISCUSSION

RESULT

This study identified 12 criteria influencing efficiency in state universities, each with varying weights (see Table 4). The findings from FGDs provide deeper insights into these criteria. The following discussion examines the criteria and outlines strategies for managing state universities.

Table 4. Weight and Ranking of Each Element

No	Element	Weight	Rank
K1	Leadership	0.14170	1
K2	Human Resources	0.10882	2
K3	Facilities and infrastructure	0.04663	11
K4	Organizational Planning	0.08763	6
K5	Financial Management	0.07518	8
K6	Organization	0.06090	10
K7	Information Technology	0.08812	5
K8	Internal Control	0.10233	3
K9	Work Culture	0.08231	7
K10	External Environment	0.04431	12
K11	Business Strategy	0.09919	4
K12	Standard Compliance	0.06288	9

Leadership

The criteria of 'Leadership' consistently appeared as a key factor throughout all research stages. This highlights the essential role of leadership in enhancing efficiency within Indonesian state universities. The FGD further confirmed that leadership is unanimously regarded as the most critical determinant of efficiency. Five critical sub-criteria were identified: leadership style, track record, commitment, decision-making style, and entrepreneurship. Commitment (33.19%) and entrepreneurship (26.45%) were identified as the most significant factors in enhancing efficiency within universities.

Universities must enhance their vision by fostering strong leadership to achieve efficiency. A shift in mindset is necessary to comprehend the distinct characteristics of each university. Mindset transformation can be accomplished through continuing education and coaching initiatives.

> Universities need goal-oriented leaders. In different situations, the required leadership style varies. In some situations, it is necessary to clarify the leader's decisions. We need commitment from all parties, especially the leaders, to achieve efficiency. (Interview, H1)

> If a leader implements policies that promote efficiency, others will follow. Visionary leaders will optimize the existing capital and assets. Using the existing or minimum capital to achieve maximum output. That is the essence of efficiency. (Interview, A2)

Human Resources

Human resources emerged as the second most crucial factor in achieving efficiency. This encompasses five primary sub-criteria: competence, selection quality, assignment suitability, adequacy ratio, and education level.

University managers consistently emphasize the critical role of human resources in enhancing efficiency. Stringent regulatory frameworks constrain human resources management in state universities. Hiring lecturers with state-employee status requires approval from the Ministry of Finance and the Ministry of State Apparatus and Bureaucratic Reform. Non-autonomous universities are restricted from employing temporary lecturers, and the processes for their recruitment are unclear. Autonomous universities (PTNBH) operate with greater flexibility, allowing them to independently recruit staff and lecturer according to their needs, thereby enhancing efficiency.

> PTN BH does not receive state-employee lecturers from the Ministry of Education. It must hire lecturers or staffs by itself and pay the salary from its own budget. So they will hire employees according to their needs. The efficiency will be achieved. (Interview, A2)

Budgetary efficiency in human resources poses challenges, as salary reductions are typically impractical. Universities are exploring alternative measures to reduce costs, including restrictions on travel and meeting budgets. During the pandemic, travel budgets were notably decreased, and meeting budgets were limited to those with external stakeholders. Certain universities, such as University E, have adopted innovative strategies, including utilising virtual accounts for petty cash management, which reduces dependence on physical cash transactions.

> Initially, each department required two treasurers. So, 17 departments required 34 treasurers. Now, just one treasurer manages 5-6 departments. So, for 17 departments, there are only five treasurers in total. (Interview, E2)

> To achieve efficiency, active and productive employees are needed. They must be

competent and have necessary skills to carry out their duties properly. (Interview, H1)

Internal Control

At the initial stage, internal control was characterized by two sub-criteria: quality control (45.07%) and periodic supervision (20.33%). Following discussions in the FGD, two additional sub-criteria were identified: the effectiveness of the supervisory board (17.36%) and risk-based control (17.24%). Internal control accounts for 10.23% of efficiency relative to other criteria within the hierarchical framework.

Internal control in state universities is implemented following the governance framework. Universities utilize both internal and external control mechanisms. The Supervision Unit and the Supervisory Board implement internal control, whereas the Supreme Audit Board oversees external control.

University managers assert that compliance with internal control guidelines is crucial for achieving efficiency. Reviews should be conducted during the preparation of activities to ensure effective planning. Discussions regarding activities planned for 2025 took place in early 2024, highlighting the significance of effective planning. Website-based applications streamline budgeting, bookkeeping, and reporting processes, allowing university leaders to monitor proposed activities, track their implementation, and identify divisions that have not yet completed reporting. Control is implemented through the use of digital signatures for documents, such as financial statements. Control in procurement is implemented through a vendor management system.

> We use the software for budgeting and activity planning. This software features a tiered user authorization system, from the top leader's level to divisions to faculties. The top-down function ensures the implementation of the leader's policies to the bottom, while the bottom-up function allows divisions to propose activities to higher management. (Interview, A1)

Business strategy

According to the FGD, the business strategy consists of three sub-criteria: collaboration (40.90%), innovation (25.19%), and promotion (33.91%). According to the FGD participants, collaboration is needed between universities, corporations, and government agencies.

Regarding business strategy, university leaders must be guided by the university's vision and mission. The new governance is expected to facilitate the achievement of goals by allowing collaboration and creating innovation space. During the COVID-19 pandemic, universities deliver online lectures. This is a momentum for universities to grow by offering better education in response to the community needs. At University D, procurement is centralized to reduce costs.

> We have partnerships with overseas universities for specific programs. We will develop a hybrid learning system. The number of students is expected to increase because we do not need a classroom. We are improving the facilities, especially the internet connection and modern devices. The abandoned classrooms are turned into workshop spaces. (Interview, F1)

Information Technology

The FGD identified four sub-criteria for Information Technology. The components consist of data and system integration (45.78%), service digitization (27.84%), data-based decision-support systems (13.26%), and document digitization (13.12%). University management suggests that achieving efficiency requires the support of appropriate technology and information systems. Procedures are necessary to ensure the provision of accurate, relevant, and reliable information. Advancements in technology have led to integrating IT assistance into various university activities to improve efficiency.

> We are developing the Digital Learning Ecosystem (DLE), which has three stages. First, we use the existing system while improving the existing one. Second, we develop an entirely new system. Third, we implement breakthroughs to organize the whole system. Currently, DLE is already in the third stage. We will continue moving toward existing complementary points due to implementation needs. DLE has reached 85-90% of office automation, representing a breakthrough. (Interview, D7)

Universities have optimized their operations by minimizing manual procedures and digitizing essential processes such as correspondence and activity management. ERP systems are extensively utilized to enhance administrative efficiency, minimize human error, and provide real-time data presentation. Online exams have decreased students' expenses. Advancements in information technology

have led to enhanced management efficiency, allowing universities to deliver improved services.

> In the past, we had to manually re-journalize files from the Treasury. Now, with an integrated ERP system, this process is no longer needed. Several receipts are fully integrated, but others still need reconciliation. We used to have ten accounting staff members in the past, but now we manage with only four. (Interview, E6)

> Accounts between the Treasury and the Accounting Division have been synchronized. So that we can do quicker reviews. (Interview, E2)

Organizational Planning

The first stage of the FGD (compilation of hierarchy structure designs) identified five sub-criteria for Organizational Planning: vision and mission alignment, review of previous achievements, realistic plans, planning maturity, and policy consistency. During the second stage of the FGD (expert confirmation to finalize the hierarchical structure), "planning maturity" was removed and replaced with "planning for the use of funds". The final analysis identified the three most influential sub-criteria: vision and mission alignment (28.19%), policy consistency (20.57%), and planning for the use of funds (17.55%).

A significant challenge in organizational planning involves reconciling constraints with the mission of state universities. Government-calculated single tuition fees are often insufficient to cover all operational expenses. To align with their vision of providing education to all students, universities implemented low-cost measures, including distance learning and online assignments, to reduce operational expenses.

> We reduced the tuition fees. This can be reduced fees or an extension of the payment period. This resulted in a tighter review of the budget. Some capital expenditures were postponed. (Interview, C4)

State universities represent the government's responsibility to provide education across various disciplines. However, the closure of Study Programs with low student enrollment is permitted. Meanwhile, strategic or rare study programs deemed essential for the nation are maintained.

> The first key to efficiency is good planning. All activities must be well planned. Universities can not rely on revenue from students, such as tuition fees. They must develop a business that generates revenue (Interview, I1).

DISCUSSION

This study identifies 12 factors that influence efficiency in state universities. It reveals that leadership, human resources, and internal control are the key factors influencing efficiency. The other factors include business strategy, information technology, and organizational planning. In addition, facilities and infrastructure, financial management, organization, work culture, external environment, and standard compliance also foster efficiency. The findings align with and enhance the current literature regarding university efficiency. The focus on leadership and human resource management supports previous studies (e.g., Bolli et al., 2016; Witte & López-Torres, 2017).

Strong top management is critical to ensuring universities achieve their vision and mission. Leadership development needs to focus on changing mindsets to embrace long-term planning. In addition, leaders must cultivate future leaders ("leaders create leaders"). Effective leadership is essential for establishing strategic direction, promoting innovation, and optimizing resources (Anindhyta et al., 2023). This finding corresponds with studies emphasizing leadership as a critical factor in institutional performance, especially when integrated with digital technologies to promote innovation (Chusniyah & Munadi, 2024).

Moreover, human resources are essential for implementing strategic objectives and cultivating a culture of excellence (Bolli et al., 2016). Competent staff not only improve institutional performance but also foster sustained competitiveness. This is particularly essential for semi-autonomous universities (PTN BLU), which experience restricted human resources management and recruitment compared to autonomous universities (PTN BH).

This research shows that improving efficiency depends on effective internal control. University top management must explain their vision to all employees to enhance a good governance culture. They need to provide space for employees to respond to challenges. Furthermore, digital technology enhances efficiency in state universities by improving decision-making and streamlining processes. Relevant service procedures, supported by technology, can significantly improve efficiency. For example, integrated systems reduce manual processes, speed up processes, and overcome distance-related constraints. Digital leadership

models are expected to leverage data-driven insights for resource allocation and strategic planning (Anindhyta et al., 2023).

Accountability and effective financial management are essential to improve efficiency in state universities (Siregar & Putra, 2024). University revenue streams include government funding, tuition fees, and other sources, including income from university-managed businesses such as convention centres, hotels, cooperatives, bookstores, and community or corporate training programs. Efficient budget allocation is essential for achieving strategic goals. Universities are expected to prioritize expenditures that directly support their primary objectives. These findings resemble Lai et al. (2015), who, based on AHP, emphasize the value of comparing operational efficiency to inform decision-making. University managers and policymakers can leverage these insights to evaluate institutional performance better and implement strategies for sustained efficiency enhancements. Global best practices underscore the importance of prudent resource allocation (Chusniyah & Munadi, 2024). Therefore, regular financial audits are essential for preventing fund misuse and enhancing accountability (Dahlan et al., 2024).

These findings show contextual factors distinct to Indonesian state universities. Autonomy influences decision-making processes, with autonomous universities showing greater flexibility than semi-autonomous and non-autonomous universities. Bureaucratic culture and regulatory frameworks present obstacles to implementing efficiency strategies, especially in human resource management and financial planning. A university's organizational culture influences its efficiency. Khumalo (2024) emphasizes the influence of physical and social environments on academic performance. A supportive and socially equitable workplace promotes collaboration, which is essential for efficiency.

The results suggest that policymakers should address the disparities in autonomy levels among state universities, as semi-autonomous and non-autonomous models encounter increased bureaucratic challenges. Comparative studies illustrate how structural governance and resource allocation reforms can address efficiency disparities between state and private universities (see e.g., Alam & Ahmed, 2024). Standardized governance frameworks that include innovative managerial practices and stakeholder participation are expected to improve organizational performance (Siregar & Putra, 2024). If governments intend to reduce gaps between state universities, they must strengthen competition and increase public, private, and international funds. Therefore, government authorities should emphasize competitive funding resources and consider the need to reduce administrative tasks.

The findings reveal an urgent need for innovation across leadership, human resource management, information technology, strategic planning, and governance. Leadership innovation is critical, as traditional top-down styles often hinder change, while more adaptive and entrepreneurial approaches allow institutional improvement (Laufer et al., 2024; Marlia et al., 2025). Similarly, human resource management must evolve beyond rigid recruitment systems toward strategic talent development and performance-based incentives to enhance institutional capacity (Yudianto et al., 2021; Tusriyanto et al., 2024). The increasing complexity of university operations also underscores the necessity of IT-driven innovation, where integrated digital systems streamline processes, reduce errors, and support data-driven decision-making (Aswar et al., 2022). These findings align with broader international evidence that innovation in leadership, human resources, and technology is indispensable for universities seeking greater efficiency and responsiveness to changing environments.

Beyond internal management, the study highlights that strategic planning and governance structures in state universities also require significant innovation. Traditional static planning is insufficient; instead, participatory, agile, and evidence-based strategies are needed to guide resource allocation and institutional priorities (Graves & Erickson, 2024). Governance reforms must further strengthen accountability, transparency, and performance monitoring, to ensure that autonomy leads to greater institutional agility rather than administrative inertia (Ngo & Meek, 2019). The cases show that when universities innovate across these dimensions, they are better positioned to deliver high-quality education and research, achieve institutional growth, and meet societal expectations. Thus, comprehensive innovation across administration and governance is not optional but essential for the future of Indonesian state universities.

The findings highlight that state universities must address institutional autonomy to enhance efficiency, including the interplay between autonomy and bureaucratic constraints. Using AHP to prioritize efficiency criteria represents a methodological advancement, providing a structured approach to understanding stakeholder perspectives.

CONCLUSION

This study identifies 12 critical criteria influencing efficiency in Indonesian state universities. The criteria include: (1) leadership; (2) human resources; (3) facilities and infrastructure; (4) organizational planning; (5) financial management; (6) organization; (7) information technology and systems; (8) internal control; (9) work culture; (10) external environment; (11) business strategy; and (12) standard compliance.

The AHP was employed to prioritize these criteria, with leadership (14.17%), human resources (10.88%), internal control (10.23%), business strategy (9.92%), information technology (8.81%), and organizational planning (8.76%) emerging as the most significant contributors to efficiency. Collectively, these six criteria represent 62.76% of the total weight.

The most influential was leadership style. To facilitate innovation and resource optimization, university leaders are expected to employ entrepreneurial approaches. Human Resources ranks second, underscoring the importance of skilled and competent personnel in enhancing organizational performance. Competence and staffing adequacy were identified as essential factors. Regulatory constraints on hiring and budgetary limitations for professional development were identified as challenges.

Internal control is positioned third, highlighting the importance of solid governance and risk-oriented controls. Effective governance practices, such as risk-based control and periodic supervision, are associated with enhanced accountability and resource management.

Business Strategy and Information Technology and Systems significantly enhance operational processes and decision-making capabilities. Collaboration with external partners and emphasizing innovation are essential for financial sustainability and competitiveness. Incorporating digital tools, including enterprise resource planning systems, has been acknowledged for minimizing manual processes and improving decision-making efficiency.

Organizational planning highlights the urgency of aligning institutional strategies with long-term objectives. Goal alignment and resource allocation are also considered essential. Participants emphasized the necessity of flexibility in planning to adapt to evolving educational needs.

This study can be considered an attempt to enhance the discourse on university efficiency by providing a nuanced analysis of how contextual factors impact performance. It aligns with scholarly discussion while offering distinct insights into the context of Indonesian higher education. This study utilizes a qualitative approach, which includes the subjective opinions of the experts. Future research may involve more diverse state universities, experts representing academics and regulators, and students to obtain a more comprehensive point of view.

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