

IMPORTANCE OF STAKEHOLDERS AND KEY PERFORMANCE INDICATORS IN CAMPUS MANAGEMENT

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Abstract. Campus managers need to balance the competing claims of different stakeholders of higher education institutions (HEIs). Previous studies in general management have indicated that the decision-making processes are highly related to stakeholders' attributes (power, legitimacy and urgency). However, such studies have not yet been conducted in the field of campus management. Therefore, this paper aims to identify the importance of key stakeholders in campus development and relevant key performance indicators (KPIs) that are essential for decision-makers in determining and explaining how their efforts are progressing towards achieving various stakeholders' goals. To explore the underlying importance of campus stakeholders, a theory on stakeholder salience and a questionnaire survey among Polish public HEIs were employed. In turn, to identify various KPIs, the content analysis of institutions' strategies was conducted. Empirical research suggests that in Polish public HEIs, authorities and academic staff continue to be regarded as the most important stakeholders (at different stages of the building's life cycle, respectively). This contrasts with the growing market-oriented approach seen in higher education globally. Moreover, the KPIs presented in HEIs' strategies are predominantly result-focused and rarely user-centric (which have begun to be perceived as the most significant with respect to building performance).

Keywords: campus management, stakeholders, buildings life cycle, key performance indicators (KPIs), user-centric KPIs, higher education institutions (HEIs).

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1. Introduction

The process of campus management has changed significantly over the last decades. Campus managers are now required to deliver an environment that not only serves as a physical place for higher education institutions (HEIs), providing practical attributes such as protection from the weather and a setting for teaching and learning (Rymarzak & Marmot, 2020), but also facilitates research and other activities. Furthermore, this environment should enhance HEIs' performance in terms of sustainable development, profitability, competitive advantage and productivity of their users (den Heijer, 2011). These multiple demands often place campus managers in a position of navigating the diverse and frequently conflicting expectations of various stakeholders. Additionally, in public HEIs, as governments progressively reduce their direct funding, campus managers are challenged to take into consideration the increasing prominence of other financial stakeholders, which they must obtain from the market. As a consequence, they are expected to rethink the management of campuses, understood as buildings and land that a HEI uses, i.e. their physical as well as the virtual environment (Ninnemann et al., 2020; den Heijer, 2021), to address the competing claims of different stakeholders (including those who have

previously been underestimated) and extract key information that advances their goals.

So far, little has been known about these new challenges. Therefore, the paper aims to identify the importance of key stakeholders in campus development and relevant key performance indicators (KPIs) that are essential for decision-makers in determining and explaining how their efforts are progressing towards achieving various stakeholders' goals.

As previous publications on campus decision-making have predominantly focused mostly on either external or internal stakeholders (Rytönen & Heywood, 2015; Wanke, 2017; Rymarzak et al., 2020), this paper expands existing theory by incorporating their respective roles at different HEI buildings' life cycle stages. Additionally, the paper develops earlier research (introducing stakeholders as involved in the decision-making process, however, without their prioritization) by classifying stakeholders according to their relative importance (attributes) based on the theory of stakeholder salience. Moreover, it also presents user-centric KPIs (which have begun to be perceived as the most significant with respect to building performance), as the existing literature has primarily focused on result-oriented metrics in HEIs.

In the following sections, the literature on campus management and stakeholder salience is examined, along with key performance indicators for background. Then, the data and methods are described, along with the results of the empirical analysis relying on the survey conducted among Polish public HEIs and the content analysis of strategies available on their websites. Finally, the discussion on key stakeholders' importance and key performance indicators is outlined, followed by a contribution of this work and its implications.

2. Theoretical background

2.1. Theories on campus management and stakeholder salience

The theory of campus management (den Heijer, 2011; Beckers et al., 2015) is grounded in Corporate Real Estate Management (CREM) theory (Joroff et al., 1993; Nourse & Roulac, 1993; Krumm, 1999) which belongs to the stakeholder theory originating in sociology, organizational behavior, politics of special interests and managerial self-interest (Jensen, 2009). According to den Heijer (2011), campus management is a complex process that enhances the performance of higher education institutions by integrating all stakeholders' perspectives, incorporating location, condition, energy aspects (physical perspective), benefits and costs (financial perspective), institutional goals (organizational perspective), and user demand (functional perspective). Among stakeholders who are linked with the four mentioned perspectives (den Heijer, 2011, p. 100, 250) are:

- specific managers, project managers, portfolio managers, and spatial department personnel,
- finance controllers from the department, faculty, HEI, and economic department,
- chairpersons, deans, executive board members, and public authorities,
- specific users, building occupants, campus users, and society at large.

It is worth noticing that these groups include not only internal stakeholders (who participate directly in campus-related activities and intervene in various aspects of campus management performance) but also external ones (who may not engage directly but can impact or be affected by the outcomes of campus management). Furthermore, the literature on higher education categorizes stakeholders differently. Commonly identified groups are: HEI authorities, including governance bodies (such as the board of trustees or supervisory council) and administrative leaders (like rectors/presidents, vice-rectors/vice-presidents, and deans); support staff (including campus managers); academic staff; students (undergraduate, postgraduate, PhD); business entities and local nonprofit or community-based organizations; suppliers; and public authorities (including both general and local governments) (Weaver, 1976; Smith & Cavusgil, 1984; Licata & Frankwick, 1996; Rowley, 1997; Alves et al., 2010).

Moreover, the literature on general management suggests that stakeholders do not have the same influence on institutions. Mitchell et al. (1997), identify three key attributes for evaluating stakeholder salience: power (voting, economic, and political to get things done), legitimacy (the perception or assumption that the actions are desirable and appropriate according to societal norms, beliefs and values) and urgency (claims for the immediate action due to time-sensitive nature i.e. short-term economic results, long-term sustainability).

In this article, as modern campus management seems to require not only the consideration of various stakeholders' perspectives (including their relations with campus management and goals) but also the determination of which stakeholder claims to give priority through different stages of buildings' life cycles, a combined classification approach is adopted. It is essential because decision-makers are often responsible for developing campuses comprising multiple buildings, which are at various life cycle phases (including planning, design, construction, or operation and maintenance). Furthermore, not all stakeholders exert the same influence at each stage of the building's lifecycle (Table 1).

Only public authorities are similarly involved in all phases. They provide financial resources to public HEIs and establish laws, regulations, and policies to support campus design and construction. Additionally, by overseeing campus operations and expenditures, they ensure public safety, compliance with environmental standards, and maximization of the return on investment for the community while ensuring accountability in the use of taxpayer resources. They exhibit three attributes: power, legitimacy and urgency. These attributes position them as definitive stakeholders (Benneworth & Jongbloed, 2010).

In turn, while HEI authorities, designers and construction companies participate the most actively at the beginning of the buildings' life cycle, additional stakeholders (such as support staff and campus users) become involved primarily during the operation and maintenance stage.

HEI authorities are responsible for allocating financial resources and approving the campus development process, ensuring it aligns with institutional goals (which often include minimizing operating costs and maximizing the campus's overall value). However, due to constraints such as limited budgets and the necessity to adhere to public procurement regulations, they tend to choose projects with the lowest initial construction or renovation costs. Given their influence in academic, financial and strategic matters, they are viewed as possessing power, legitimacy and urgency, which positions them as definitive stakeholders (Szarek, 2023).

While designers propose various design alternatives to identify and recommend the most optimal campus configuration, the construction companies are responsible for executing the project, ensuring it is completed on time, within budget, and according to the approved specifications (Sleiman et al., 2024). The quality of their work will

Table 1. Stakeholders of public HEIs and their relations with campus management (source: own elaboration based on Rymarzak et al., 2020; Sleiman et al., 2024)

Buildings' life cycle stage	Key stakeholders	Relations with campus management and their goals	Attributes
Planning, design & construction	Public authorities	Provide financial resources and establish building regulations and standards for the design and construction of facilities Support the development of HEIs through quality infrastructure	Power, legitimacy, urgency
	HEI authorities	Allocate financial resources as well as approve and oversee campus development Primarily interested in the operational costs and the overall value of the campus	Power, legitimacy, urgency
	Designers and construction companies	Propose various design alternatives to identify and recommend the most optimal campus configuration Execute the project and ensure it is completed on time, within budget, and according to the approved specifications	Legitimacy
Operation & maintenance	Public authorities	Oversee campus operations for public safety and adherence to environmental standards Verify the effective expenditure of public funds to maximize the return on investment for the community and ensure accountability in the use of taxpayer resources	Power, legitimacy, urgency
	Support staff	Determine the campus's performance on a day-to-day basis and its overall development Focus on the technical aspects of the campus (related to the maintenance and operation), and others (linked to climate change, reduction of operating costs, and enhancement of campus users' productivity)	Legitimacy, urgency
	Campus users	Interact with the campus, which affects HEI performance Primarily interested in ensuring their physical, social and mental well-being	(Power), legitimacy, urgency

ultimately determine the campus's durability, longevity, operational costs, and attractiveness to users. Given that their primary attribute is legitimacy, the relationship remains discretionary.

Support staff play a crucial role in determining the campus's daily performance and overall development. Traditionally, their focus was primarily on technical aspects of the campus related to maintenance and the efficient, safe and comfortable operation (Galiano-Garrigos & Andújar-Montoya, 2018). However, over the past decades, as higher education has changed, including the need to pay considerable attention to international global rankings, they have become involved in many activities aimed at combating climate change (Antonowicz et al., 2025), reducing operating costs, and enhancing the productivity of campus users (den Heijer, 2021). With legitimacy and urgency as their predominant attributes, they find themselves in a dependent position, relying on other stakeholders (particularly HEI authorities) to fulfil their demands.

Campus users represent a wide-ranging group of stakeholders, encompassing academic and administrative staff, students, business entities, and local non-profit or community-based organizations. Their interactions with the campus significantly impact not only HEI performance but also their physical, social and mental well-being. Traditionally, these stakeholders have demonstrated attributes of legitimacy and urgency, placing them in the dependent stakeholder positions. Due to their often conflicting

needs and diverse perceptions of satisfaction in educational buildings (shaped by characteristics such as activity, routines, age, gender, etc.), they have been criticized for lacking clarity about their preferences. As a result, decisions have frequently been made without their involvement. However, as market-oriented reforms are increasingly adopted in higher education systems across various countries, including the USA, Spain, the UK, Finland, Japan, Australia, Sweden, and the Netherlands, among others (Rothschild & White, 1995; Kaklauskas et al., 2012; Rymarzak & Marmot, 2020), students and business entities in particular have gained a third attribute: power. This shift arises from their direct or indirect financial contributions (whether through tuition fees, state subsidies, or co-funding research activities, respectively), which elevate their status to that of definitive stakeholders. It also led to the need to develop appropriate KPIs to measure how campus management efforts are progressing towards meeting their goals.

2.2. Key performance indicators for campus management

The scientific literature presents numerous definitions of key performance indicators (KPIs), which are generally viewed from both a narrower and a broader perspective. According to the narrower perspective, terms such as "metrics," "measures," and "indicators" are treated as

synonymous (de Wilde, 2018; Re Cecconi et al., 2019). In contrast, the broader perspective recognizes that these terms carry different implications. “Metrics” typically reflect how performance changes over time or across various dimensions. “Measures” denote the values or quantities that represent the performance. In contrast, “indicators” are often combined values that reflect the performance with easy-to-understand information rather than relying on raw operational measurements. Originating from the business world, key performance indicators (KPIs) serve as essential navigational instruments that monitor performance and draw attention when a project diverges from its intended path (Li et al., 2021). In this study, all terms are synthesized as KPIs, defined as a set of metrics, measures, and indicators that focus on those aspects of campus management that are the most critical for the process and achieving goals.

Existing studies have proposed a range of KPIs, which are primarily categorized as follows (Lavy et al., 2014a; Lai & Man, 2017; Sangwa & Sangwan, 2018):

- quantitative vs. qualitative: quantitative KPIs (i.e. hard, objective) are quantifiable by giving a magnitude value, while qualitative KPIs (i.e., soft, subjective) are typically measurable descriptively by using adjectives,
- input vs. output: input KPIs (i.e. process-oriented) measure the resources consumed during the generation of the outcome, whereas output KPIs (i.e. result-oriented) reflect the outcome or results of the process activities.

To evaluate campus management, many metrics have been designed. A considerable number of these are result-oriented indicators from a managerial perspective (i.e. HEI authorities and support staff aimed at facilitating strategy

execution), especially in the context of higher education institutions’ (den Heijer, 2011, p. 100):

- sustainable development – physical perspective (i.e. energy use per m², energy use per user, CO₂ emission per m², CO₂ emission per user, energy labels of buildings, footprint in m² per user),
- profitability – financial perspective (i.e. revenue minus costs, solvency, liquidity, position on the innovation index, citation score, economic value of alumni, increased real estate value),
- competitive advantage – organizational perspective (i.e. international rankings, market share of students, quality of alumni, student satisfaction, alumni satisfaction, employee satisfaction),
- users’ productivity – functional perspective (i.e. publications per academic FTE, output per m², students per m², employees per m², energy costs per m², total costs of ownership as % of total costs, etc.).

However, the literature on building performance has emphasized the significance of occupant-centric (sometimes called relationship-oriented) indicators for many years. In campus management, this issue is only beginning to gain greater recognition. This shift reflects the view of campus management as a process that should deliver added value not only to HEIs (as organizations), but also to individuals or groups who are their stakeholders (Mustafa, 2017; Hassanain et al., 2024), including campus users who play a crucial role in campus operation and maintenance.

In the literature, occupant-centric KPIs are defined as those that prioritize occupant needs and utilize a broad spectrum of information related to, and originating from, occupant to support occupant-centric building design, construction, operation and maintenance (Heimar

Table 2. User-centric KPIs for campus management (source: own elaboration based on Lavy et al., 2014a; Mustafa, 2017; Hassanain et al., 2024; Rymarzak, 2025; Umar et al., 2025)

Aspect	Examples of KPIs
Physical well-being	Availability and quality of sports facilities and dormitories Availability and quality of healthy food Overall satisfaction with the lighting level (both natural and artificial), acoustics, temperature, air quality, furniture ergonomics, and cleanliness Overall satisfaction with the workstation spacing/number of students and employees per m ² of building area Availability and adequacy of safety features (first aid, fire extinguishers, fire alarms, labelling, exit signs) Number of accidents or incidents on campus Percentage of absentees due to accidents Number of thefts, break-ins, aggressive behaviour, and fraud incidents
Social well-being	The quantity and quality of interaction rooms Overall satisfaction of minority groups (including international students) with campus facilities (i.e. English labelling) Accessibility for individuals with disabilities and elderly people Size and adequacy of spaces for social interaction Availability of interactive rooms
Mental well-being	Availability and quality of individual spaces and their equipment (furniture quality, size, appearance and adequacy) Overall satisfaction with privacy and territoriality Availability, size, and atmosphere of relaxation, reflection, and contemplation areas Overall satisfaction with building services Overall satisfaction with the campus’s aesthetics (paint quality, colours, etc.), decoration, and interior design (interior and exterior) The quantity and quality of greenery and vegetation on campus Number of days of absence due to mental disorders

Andersen, et al., 2024). These indicators (hereafter referred to as user-centric KPIs) can be associated with various aspects. Preiser (1995) asserted that they are connected to: 1) health, safety and security, 2) functionality and efficiency; and 3) psychological, aesthetic and socio-cultural. In turn, recent literature – following ideas promoted by organizations such as the World Health Organization (WHO) – indicates that such KPIs should focus on users': 1) physical well-being (related to features of the campus environment that impact health, comfort, safety and security), 2) social well-being (associated with various solutions that encourage cooperation, creative problem-solving and social interaction) and 3) mental well-being (connected to the strengthening of cognitive or mental processes) (Lee, 2019; Rymarzak, 2025). Table 2 presents their examples.

User-centric KPIs can be measured through two approaches to data collection: objective and subjective (Alwaer & Clements-Croome, 2010; Lavy et al., 2014b). The objective approach encompasses both direct observation (by an external observer) and other sources, including environmental monitoring – such as the real-time and large-scale collection of data from Building Management Systems (BMS) and Building Automation Systems (BAS).

In turn, the subjective approach seeks the perceptions of building users through feedback mechanisms, such as complaints received via calls, emails, texts, apps, occupant voting systems or interpersonal interactions. However, many researchers find these methods insufficient for generalizing the analysis of users' comfort, as they rely on incidental subjective responses, which pose significant challenges in addressing such situations. Consequently, they advocate for the implementation of a systematic and rigorous building assessment process, including surveys for data collection. This approach has become mandatory in some countries for public projects to ensure the optimization of building operational performance and enhance user satisfaction. Additionally, it contributes to the standardization of best practices and continuous improvement by recording and transferring lessons learned to future design and construction processes (Nawawi & Khalil, 2008; Kirwan & Rogers, 2020), as well as increasing managers' accountability.

3. Data and methods

The study is based on the example of the Polish higher education system. It was chosen as the largest in Central and Eastern Europe and one of the largest in the European Union regarding student enrollment, following only Germany, France, Spain, and Italy (Eurostat, 2022). In 2023, it catered to more than 1.2 million students. Primarily funded by public sources, the Polish higher education landscape consists of 416 institutions, including 103 public academic (research-intensive) universities. Of these, 64 HEIs are under the supervision of the minister responsible for higher education and science, while the remaining 39 others

(comprising medical, artistic, military, naval and civil service institutions) are overseen by other ministers.

The total enrollment across all institutions reached 747,329 students, with the majority being full-time, while approximately 149,260 (19.97%) were part-time students (RAD-on, 2023). Publicly funded HEIs are not permitted to charge tuition fees for full-time studies conducted in Polish, which are instead funded through taxation. Tuition fees are applicable only for studies offered in languages other than Polish (an increasingly popular in recent years) and for part-time programs (including postgraduate studies), with the fee levels determined by each HEI (Rymarzak & Marmot, 2020).

Quantitative and qualitative research was conducted between May 2023 and December 2024 to identify, respectively, the importance of key stakeholders in campus development and relevant key performance indicators that are essential for decision-makers in determining and explaining how their efforts are progressing toward achieving various stakeholders' goals.

Since the significance of key stakeholders is relatively unexplored in general and at Polish public HEIs, and pertinent information is not publicly available, quantitative research utilizing a structured questionnaire was deemed appropriate (Saunders et al., 2023). The questionnaire was anonymous to increase the response rate. It asked the respondents to: 1) specify the importance of the named stakeholders in campus management; 2) indicate the frequency with which opinions are collected from campus users to address their needs. To quantify responses, a 5-point Likert scale was employed, with ratings ranging from 1 to 5, where 1 indicates "not important" and 5 signifies "very high importance". Campus managers as respondents were selected based on institutional literature emphasizing that those routinely involved in organizational decisions (like particular stakeholders) are more influential actors than those whose participation is more sporadic (Greenwood et al., 2011). In Polish HEIs, the campus managers' role is played by the chancellors and general directors.

The survey questionnaire was distributed via email to 62 out of 64 HEIs under the supervision of the minister responsible for higher education and science (representing the entire study population). Two HEIs, specifically Pi-otrzkow Academy and Nicolaus Copernicus University, were not included, as they were in the process of being established. Although Poland has a total of 103 public academic HEIs, the 39 overseen by other ministers and mentioned above were not covered in the analysis due to the unique characteristics of their campuses.

The feedback of 31 HEIs was obtained (including 17 universities, 7 universities of technology, and 7 academies), accounting for 50% of the total public academic HEIs considered in the study. The survey results are based on descriptive statistical analyses (including median, mean, and standard deviation). To examine the differences between: 1) the importance attributed to the various stakeholders by respondents, 2) the answers from different types of HEIs, the

Wilcoxon signed-rank test (for dependent observations) and the Mann-Whitney U test (for independent samples) were used, respectively. These non-parametric tests are suitable for identifying differences between two groups, and are appropriate for non-normally distributed data and ordinal variables (McKnight & Najab, 2010).

In turn, to identify the relevant key performance indicators (KPIs), qualitative research was conducted through a content analysis of strategies from 62 HEIs. All these documents, obtained through the institutions' websites, were analyzed to provide a comprehensive overview of KPIs within the entire study population. They exhibited significant variation in both content length (ranging from 3 to 100 pages) and the duration over which they were developed (spanning from 4 to 21 years).

In each strategy document, individual keywords (nouns, verbs or adjectives), as well as their synonyms or logically interconnected words with KPIs, were searched. The content analysis was conducted manually. The examination of documents resulted in the identification of 37 text fragments related to KPIs. Similar fragments were reformulated and consolidated, ultimately leading to a total of 25 KPIs. These KPIs were then categorized into the two aforementioned groups of KPIs: result-focused and user-centric. Result-focused KPIs were further associated with four perspectives (physical, financial, organizational and functional), while user-centric KPIs were linked to three dimensions of well-being (physical, social and mental). These categories were derived from literature to ensure coherence and relevance to the research objective.

4. Results

4.1. Key stakeholders of public HEIs and their importance

The research results reveal that stakeholders can have different levels of importance in campus management. Ta-

ble 3 presents an overview of how the Polish public HEIs ranked the importance of the named stakeholders at various stages of the buildings' life cycle, from not important to very important.

At the planning, design and construction stage, HEI authorities were ranked higher (with an average of 4.58 out of 5) than designers and construction companies (4.29). The opinions of HEI authorities, as well as those of designers and construction companies, were at least important for 96.77% and 90.32% of respondents, respectively. The difference in the influence levels between stakeholders was statistically significant (Wilcoxon signed-rank test, p -value = 0.049). Moreover, for HEI authorities, statistically significant differences in their importance were observed between universities of technology and academies (Mann-Whitney U test, p -value < 0.0001), universities of technology and universities (p = 0.002), as well as universities and academies (p = 0.039). Regarding designers and construction companies, significant differences were found between academies and universities of technology (p < 0.0001) and academies and universities (p = 0.047).

In turn, at the operation and maintenance stage, academic staff were the highest-ranked stakeholders (4.19 out of 5). According to 90.32% of respondents, they exert an important or very important influence on campus decision-making. Students followed closely (4.13), and 87.09% of respondents considered them to have at least an important impact on decision-making processes. In contrast, the opinions of business entities and local non-profit or community-based organizations were viewed as having the least influence, with only 51.62% of HEIs acknowledging their importance. Nevertheless, they were regarded as having a degree of salience to the sector.

Notably, a statistically significant difference was found in the importance of academic staff opinions between academies and universities of technology (Mann-Whitney U test, p -value < 0.0001), with academic staff regarded as more influential in academies. Additionally, significant

Table 3. The importance of various stakeholders in campus management – in total and by type of HEI (source: own study)

Campus life cycle stage	Stakeholders	Per cent					Median	Mean	Standard deviation
		Not important	Slightly important	Mod-erately important	Impor-tant	Very impor-tant			
Planning, design & construction	HEI authorities								
	Total	0	0	3.23	35.48	61.29	5	4.58	0.56
	University	0	0	5.88	58.82	35.29	4	4.29	0.59
	University of technology	0	0	0	0	100.00	5	5.00	0.00
	Academy	0	0	0	14.29	85.71	5	4.86	0.38
	Designers and construction companies								
	Total	0	6.45	3.23	45.16	45.16	4	4.29	0.82
	University	0	11.76	5.88	52.94	29.41	4	4.00	0.94
	University of technology	0	0	0	42.86	57.14	5	4.57	0.54
	Academy	0	0	0	28.57	71.43	5	4.71	0.49

End of Table 3

Campus life cycle stage	Stakeholders	Per cent					Median	Mean	Standard deviation
		Not important	Slightly important	Mod-erately important	Impor-tant	Very impor-tant			
Operation & maintenance	Support staff								
	Total	0	9.68	3.23	70.97	16.13	4	3.94	0.77
	University	0	11.76	5.88	70.59	11.76	4	3.82	0.81
	University of technology	0	14.29	0	85.71	0	4	3.71	0.76
	Academy	0	0	0	57.14	42.86	4	4.43	0.54
	Campus users								
	Academic staff								
	Total	0	0	9.68	74.19	16.13	4	4.19	0.48
	University	0	0	5.88	82.35	11.76	4	4.06	0.43
	University of technology	0	0	0	71.43	28.57	4	4.29	0.49
	Academy	0	0	28.57	57.14	14.29	4	4.43	0.54
	Students								
	Total	0	6.45	6.45	67.74	19.35	4	4.13	0.72
	University	0	5.88	5.88	70.59	17.65	4	4.12	0.70
	University of technology	0	0	0	85.71	14.29	4	4.14	0.38
	Academy	0	14.29	14.29	42.86	28.57	4	4.14	1.07
	PhD students								
	Total	0	19.35	3.23	58.06	19.35	4	3.77	0.99
	University	0	11.76	5.88	64.71	17.65	4	3.88	0.86
	University of technology	0	42.86	0	57.14	0	4	3.14	1.07
	Academy	0	14.29	0	42.86	42.86	4	4.14	1.07
	Business entities, local non-profit, community-based organizations								
	Total	3.23	35.48	9.68	48.39	3.23	4	3.13	1.06
	University	5.88	23.53	5.88	58.82	5.88	4	3.35	1.12
	University of technology	0	42.86	14.29	42.86	0	3	3.00	1.00
	Academy	0	57.14	14.29	28.57	0	2	2.71	0.95

Table 4. Frequency of collecting feedback on campus – in total and by type of HEI (source: own study)

Frequency of collecting opinions	Total	Type of higher education institution		
		University	University of technology	Academy
Other frequency (as needs arise)	45.16%	41.18%	57.14%	42.86%
Annually	35.48%	35.29%	42.86%	28.57%
Every two years	9.68%	5.88%	0%	28.57%
No feedback collection	9.68%	17.65%	0%	0%

differences were observed in the perceived influence of various student groups (Wilcoxon signed-rank test, p -value = 0.020). Undergraduate and postgraduate students were considered more influential compared to PhD students. This difference may be attributed to the larger number of undergraduate students at Polish HEIs.

Most higher education institutions, representing 90.32% of respondents, actively collected feedback from campus users to address their needs and expectations (Table 4).

Among these institutions, 45.16% gathered opinions on an as-needed basis, while 35.48% collected feedback

annually, and 9.68% did so every two years. Importantly, only 9.68% of institutions reported that they did not engage in any dialogue with campus users, and this group consisted solely of universities.

4.2. Key performance indicators in public HEI strategies

The analysis of 62 strategies reveals that only 35.48% of Polish public HEIs incorporate KPIs as part of their goal implementation monitoring. However, some institutions, integrate KPIs: in the full version of the strategy such as

Silesian University of Technology (2021), in separate documents published by order such as Cracow University of Technology (2021), within operational programs such as Gdansk University of Technology (2020), or in other formats such as Poznan University of Technology (2021), and Wroclaw University of Science and Technology (2023). Others indicated that they plan to establish KPIs at a later stage, such as University of Life Sciences in Lublin (2019), and Poznan University of Life Sciences (2022).

The analyzed HEI strategies in the context of campus management mainly featured result-oriented KPIs (primarily related to the financial and physical perspectives), with significantly fewer user-centric KPIs (Table 5).

Data were collected at HEIs through two approaches: objective and subjective. The first approach, based on direct observations (conducted predominantly by administrative staff) and other sources (including environmental monitoring through Building Management Systems – BMS), was implemented at Wroclaw University of Environmental and Life Sciences (2024). The subjective approach, in turn, included gathering opinions through:

- regular or sporadic meetings which were held mainly with employees and/or students, as in Cardinal Stefan Wyszyński University in Warsaw (2022) or Casimir Pulaski Radom University (2022),

Table 5. Key performance indicators in Polish public HEI strategies (source: own study)

Type of KPIs	Category	Examples of KPIs	Examples of HEIs
Result-focused	Physical perspective	Number of installations utilizing renewable energy sources Number of implemented low-emission and energy-saving technologies Demand for heat and electricity Number of bicycle parking spaces Area of sustainable university infrastructure Number of initiatives aimed at enhancing the university's technical infrastructure	AGH University of Krakow (2022); Jędrzej Sniadecki Academy of Physical Education and Sport in Gdansk (2020); University of Physical Education in Krakow (2021); Józef Piłsudski University of Physical Education in Warsaw (2020); Wroclaw University of Health and Sport Sciences (2021); University of Warmia and Mazury in Olsztyn (2021); University of Warsaw (2023); Warsaw University of Life Sciences (2021)
	Financial perspective	Costs of maintaining buildings Value of financial outlays allocated for investments and modernization of campus facilities and laboratories Revenue from rent and leases Proportion of renovation and maintenance expenses relative to total income Share of investment expenses in total income Percentage of income from renting premises within the university's overall income Ratio of own income to the value of net fixed assets	AGH University of Krakow (2022); Bialystok University of Technology (2021); Lublin University of Technology (2021); Kielce University of Technology (2023); Jan Kochanowski University of Kielce (2021); University of Agriculture in Krakow (2021); University of Szczecin (2019); University of Silesia in Katowice (2021); University of Warsaw (2023)
	Organizational perspective	Institution's standing in international rankings Number and scope of activities aimed at adapting infrastructure to fulfil the university's missions	Józef Piłsudski University of Physical Education in Warsaw (2020); Jan Długosz University in Czestochowa (2018); Adam Mickiewicz University Poznan (2020); AGH University of Krakow (2022); Maria Curie-Skłodowska University (2019); University of Szczecin (2019); Casimir Pulaski Radom University (2022)
	Functional perspective	Number of student publications Number of publications in the most prestigious scientific journals Average percentage of campus utilization Proportion of students with disabilities to other students	AGH University of Krakow (2022); Krakow University of Economics (2021); Maria Curie-Skłodowska University (2019); Józef Piłsudski University of Physical Education in Warsaw (2020); University of Agriculture in Krakow (2021); University of Szczecin (2019)
User-centric	Physical well-being	Number of accidents per 1,000 individuals on campus Availability of places created for recreational activities Extent of adaptations made to university buildings to meet fire protection regulations	Lublin University of Technology (2021); Kielce University of Technology (2023); Wroclaw University of Health and Sport Sciences (2021)
	Social well-being	Availability of accommodations/solutions designed for individuals with disabilities	Józef Piłsudski University of Physical Education in Warsaw (2020); Maria Curie-Skłodowska University (2019); University of Silesia in Katowice (2021)
	Mental well-being	Percentage of employees, students and PhD students considering the university as a friendly environment to work and study	Warsaw University of Technology (2021)

- with the academic community, as in University of Economics in Katowice (2018),
- opinions obtained from working groups, as in Jędrzej Sniadecki Academy of Physical Education and Sport in Gdansk (2020),
- competitions for infrastructure projects (whether investment or renovation) submitted by employees, students, and PhD students within civic budgets, as in Gdansk University of Technology (2020),
- satisfaction surveys, as in University of Physical Education in Krakow (2021), Krakow University of Economics (2021) and University of Warsaw (2023).

5. Discussion

The research findings show that stakeholders hold varying levels of importance at different stages of the building's lifecycle. Authorities and academic staff emerge as the most influential stakeholders at HEIs, aligning with the studies of Falqueto et al. (2020). Given the increasing competition among HEIs, the insufficient government funding and the growing prominence of other financial stakeholders, Polish public HEIs need to reduce their role in line with managerialism/corporatism (McCann et al., 2022) and market-oriented reforms (Kaklauskas et al., 2012) increasingly implemented in the higher education sector. They have to pay more attention to business entities (using various campus spaces such as laboratories, science parks, and business incubators) and students (especially those enrolled in paid undergraduate programs conducted in English, as well as postgraduate and PhD studies) and recognize them as one of the most important stakeholders, which corroborates the research of Kettunen (2015). This shift is particularly relevant as their role in financing public higher education is growing. Moreover, they are beginning to demonstrate three attributes: power, legitimacy and urgency.

To assess campus managers' progress in achieving stakeholder goals, Polish HEIs currently provide few KPIs in their strategies. The ones included (mainly result-oriented) have so far primarily focused on monitoring and improving HEI performance, particularly in terms of profitability (financial perspective) and sustainable development (physical perspective). With the ongoing changes in higher education and the evolving importance of stakeholders (the growing prominence of other financial stakeholders), performance assessment practices should increasingly concentrate on non-financial qualitative aspects, particularly those related to campus users and their satisfaction, as reaffirmed by Wilkins et al. (2022).

The few existing KPIs that pertain to them primarily focus on measures or indicators related to legal requirements (including health and safety regulations), overall safety on campus, and the needs of individuals with disabilities. There is a notable absence of numerous examples of KPIs addressing: features of the campus environment that encourage comfort and safety (associated with physical well-being), solutions that foster cooperation, creative

problem-solving and social interaction (linked to social well-being), as well as initiatives strengthening cognitive or mental processes (connected to mental well-being). Although the latter ones are gaining increasing importance in contemporary campus settings, as discussed by Travia et al. (2020).

The KPIs were measured mostly through a subjective approach (involved gathering opinions). In many cases, however, students' needs were addressed predominantly from the perspective of managers rather than directly from the students themselves, which is a common characteristic of HEIs with a less customer-focused approach (Falqueto et al., 2020). Only a small portion was collected through objective ones, likely due to the high cost of measuring user-related information. As sensing technologies, Internet of Things (IoT) advancements, and user prediction methods continue to mature, collecting user-related information is expected to become more affordable. This data is crucial for the effective functioning of facilities, helps with better future-proofing of the buildings and mitigates risks of failing functionally or being vacated prematurely. Furthermore, it can ensure the long-term health of the institution and its stakeholders (Massen, 2000; Sleiman et al., 2024).

6. Conclusions

This paper has identified the importance of key stakeholders in campus development and relevant key performance indicators (KPIs) that are essential for decision-makers in determining and explaining how their efforts are progressing towards achieving various stakeholders' goals. It offers at least two important theoretical contributions to improve campus decision-making and provides valuable insights for future work. First, it expands existing theory on campus management by incorporating the roles of stakeholders (based on stakeholder salience theory) at different stages of the HEI buildings' life cycle. Second, it presents user-centric KPIs (aligning closely with the needs and behaviors of occupants), as the existing literature has primarily focused on result-oriented metrics in HEIs. However, it is important to note that these metrics should not replace other campus management indicators; rather, they are intended to complement the overall assessment and support occupant-centric campus design, construction, operation and maintenance.

The study also provides a significant contribution to practice. The insights presented can be instrumental for HEIs seeking more effective campus management. They may assist managers in developing strategies that align with and support the goals of key stakeholders.

Furthermore, the study's findings can have important political implications. They signal the necessity for policy-makers to consider implementing a systematic and rigorous assessment process for HEI buildings. As similar procedures (i.e. surveys for data collection) are already mandatory in some countries for public projects, adopting such an approach could help standardize best practices

and foster continuous improvement. Additionally, it would enhance managerial accountability in the use of taxpayer resources.

However, several limitations of the current research should be acknowledged. The findings may not be universally applicable, as stakeholders in different national and institutional contexts may possess varying context-dependent salience. Moreover, the three key attributes – power, legitimacy, and urgency – are dynamic rather than static (may fluctuate over time). Therefore, recalibration of the relative importance of each stakeholder may be necessary, along with the adaptation or selection of different KPIs.

Future studies could incorporate an analysis of supplementary internal documents (those not publicly available) to identify more KPIs (in particular, user-centric), as the current study included a review of existing KPIs within the strategies of Polish public HEIs. Exploring data collection methods is also necessary to enhance the robustness and depth of analysis. Addressing these areas will facilitate both theoretical understanding and practical application, contributing to the ongoing development of campus management.

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