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Information Technology-Based School Governance and SNBP Outcomes in Public Senior High Schools in Malang City

Tutug Sri Jatmiko[a,1,*], Anis Syamsu Rizal[b,2]

[*a,b] Universitas Pamulang, Indonesia
[1]dosen01338@unpam.ac.id; [2]dosen01955@unpam.ac.id
*Correspondent Author; *dosen01338@unpam.ac.id*

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ABSTRACT

This study examines the relationship between school governance practices and publicly reported SNBP outcomes at seven public senior high schools in Malang City during 2023–2025. Using a qualitative descriptive-comparative multiple-case design, the study analyzes secondary data from school documents, local media, and the National Selection for University Admission Committee (SNPMB). Governance practices are examined through four dimensions: school policies and strategies, accountability and student-data mapping, stakeholder involvement, and digital academic-data management. The findings reveal differences among schools. SMAN 1 Malang emphasized study-program mapping involving students, parents, and guidance counsellors; SMAN 3 focused on digital learning infrastructure; SMAN 4 developed external partnerships; SMAN 5 maintained a consistent school-development strategy; SMAN 6 showed an increase in reported SNBP outcomes; and SMAN 8 faced emerging challenges related to AI governance. The change in the national SNBP quota from 30% to 20% in 2024 is considered an important contextual factor when comparing results across years. The study suggests that consistent governance, accountability, stakeholder coordination, and effective data use may be associated with differences in SNBP outcomes. However, the findings do not establish a causal relationship. This study contributes to educational governance research by applying corporate governance perspectives and selected COBIT 2019 principles to public secondary schools.

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Introduction

The National Selection Based on Achievement (SNBP) is one of the three national pathways for admission to Indonesian public universities. It evaluates applicants through achievement-based criteria, including school-record information submitted through the national admissions system (SNPMB, 2025). Because school-level outcomes are publicly

reported for some institutions, SNBP provides a potentially useful but limited indicator for examining governance-related patterns. It should not, however, be treated as a comprehensive measure of overall student achievement.

Publicly available school and media reports show variation in reported SNBP outcomes and governance-related practices among public senior high schools in Malang City. SMAN 5 Malang reported 63 students admitted through SNBP in 2024, while SMAN 1 Malang reported 58 admitted students out of 131 eligible students in 2024. SMAN 6 Malang reported an increase from 24 to 39 students, and SMAN 10 Malang reported 36 students admitted through SNBP in 2025 (Radar Malang, 2024; Suryamalang/Tribunnews, 2024; SMAN 10 Malang, 2025). Selected 2026 publications are used only as contextual evidence. The cases provide variation in governance practices, including data-based study-program mapping, digital learning infrastructure, external partnerships, sustained non-IT strategies, transparent reporting, and emerging AI use.

These variations raise a central research question: How do differences in school governance practices, including policies, accountability structures, stakeholder coordination, digital capabilities, and academic-data use, correspond with differences in publicly reported SNBP outcomes among public senior high schools in Malang City? Rather than assuming a causal relationship, this study adopts a comparative governance perspective to identify patterns of association across cases. The analysis draws on agency theory (Jensen & Meckling, 1976), stewardship theory (Donaldson & Davis, 1991), and stakeholder theory (Freeman, 1984; Aguilera & Ruiz Castillo, 2025), complemented by selected information technology governance principles from COBIT 2019 (ISACA, 2019). Recent studies on digital school leadership and data use suggest that technology can support effective school management when integrated into leadership practices, organizational routines, and evidence-based decision-making (Setiawan & Lestari, 2025; Shamsuddin & Razak, 2024; Wollscheid et al., 2025).

The objectives of this study are: (1) to map governance practices, particularly information-technology use and academic-data management, among selected public senior high schools in Malang City; (2) to compile publicly verifiable SNBP outcome evidence for the 2023–2025 study period, with selected 2026 evidence used only for context; (3) to interpret cross-case patterns through agency, stewardship, stakeholder, and selected IT-governance perspectives; and (4) to clarify the study's contribution and limitations without making causal claims that exceed the research design.

Unlike longitudinal school-level learning achievement indices that have not been publicly released in an integrated form, SNBP data have three methodological advantages for this study: (a) they are officially published annually by SNPMB at national and provincial levels (SNPMB, 2025; SNPMB, 2026); (b) they are also frequently published at the school level by school public-relations units and local media shortly after the announcement (Radar Malang, 2024; SMAN 10 Malang, 2025); and (c) the assessment process explicitly considers the student's school record and the accuracy of digital report-card data (e-report), creating a conceptual link with the quality of academic data governance at the school level (Liputan6, 2025; SNPMB, 2025). These characteristics make SNBP a relatively accountable achievement indicator for research on school governance compared with indicators whose data are not publicly verifiable.

Agency theory (Jensen & Meckling, 1976) views the relationship between education authorities/school committees as principals and school principals/teachers as agents as potentially involving divergent interests and information asymmetry, thereby requiring clear monitoring and reporting mechanisms. The study-program preference mapping

mechanism implemented by guidance and counselling teachers at SMAN 1 Malang—which involves collecting data on preferred study programs, academic rankings, and redirecting students with lower prospects—can be interpreted as a data-based governance instrument that reduces information asymmetry between school decision makers and students/parents (Suryamalang/Tribunnews, 2024).

Stewardship theory (Donaldson & Davis, 1991) explains how educational leaders may be intrinsically motivated to pursue institutional goals without relying heavily on external monitoring. SMAN 5 Malang's three-year strategy, which emphasizes local-wisdom conservation and foreign-language development (Radar Malang, 2024), and SMAN 6 Malang's reported increase in SNBP admissions from 24 to 39 students (Radar Malang, 2024) may reflect stewardship-oriented practices. These examples illustrate how consistent leadership strategies and continuous school development may contribute to improving educational quality over time, even without direct external incentives.

Stakeholder theory (Freeman, 1984; Aguilera & Ruiz Castillo, 2025) highlights the importance of involving multiple stakeholders in organizational governance. SMAN 4 Malang's "Dream Career Profession Class," developed in collaboration with the Faculty of Medicine at Universitas Airlangga and other institutions (Malang Posco Media, 2024), and the involvement of parents in study-program mapping at SMAN 1 Malang (Suryamalang/Tribunnews, 2024) illustrate governance practices that engage different stakeholders. By incorporating the perspectives and contributions of students, parents, and external partners, these initiatives may help schools better support students' academic planning and university admission preparation.

The COBIT 2019 framework emphasizes alignment between IT strategy and institutional objectives through the Align, Plan, Organize (APO) and Deliver, Service, Support (DSS) domains, including the management of data as a strategic asset (ISACA, 2019). In the context of SNBP, these domains are reflected in the management of e-report cards and school indices used as the basis for SNPMB assessment (SNPMB, 2025), as well as in the use of digital learning platforms such as Google Workspace for Education and Belajar.id accounts at SMAN 3 Malang, which support digitally based project management and technological literacy among teachers and students (SMAN 3 Malang, n.d.). Previous COBIT-based IT governance studies in Indonesian education have largely focused on academic information systems in higher education (Jurnal Teknologi Sistem Informasi, 2024) and have not addressed academic data management at the senior-high-school level in relation to university admission outcomes such as SNBP.

A review of relevant literature indicates three related but insufficiently integrated clusters. The first concerns school leadership, quality culture, and strategic management, where recent studies emphasize leadership capacity and data-informed digital transformation. The second concerns practical discussions of SNBP and school records, which provide useful contextual information but generally do not employ a formal governance framework. The third concerns IT governance and digitalization, including COBIT-based information-system studies and broader work on digital school governance. A recent systematic review of school-governance research identifies digital governance, autonomy and control, participation, and datafication as important themes, while noting that their intersections remain an active area for research (Wollscheid et al., 2025). The present study addresses this intersection by examining selected public senior high schools in one city through a multi-case governance lens.

Table 1. Research-gap map and the position of the present study.

Research Cluster	Focus & Example Sources	Limitation	Position of the Present Study
General school management and leadership	Quality culture, supportive leadership, and school-leadership strategies (JBMP 2025; MoE 2025)	Does not use a nationally verifiable outcome indicator or a formal corporate-governance framework	Uses SNBP as a verifiable outcome indicator and agency, stewardship, and stakeholder theories as the formal framework
Practical guidance on SNBP outcomes	Practical advice on SNBP admission and the role of school records (Liputan6 2025; Stekom 2026)	Primarily popular guidance, without a formal theoretical framework or academic multi-case design	Brings school records and data-governance issues into an academic multi-school case study
COBIT-based IT governance	IT-governance maturity assessment in higher education (JTSI 2024)	Focuses on higher education rather than senior-high-school academic data and university-admission outcomes	Applies selected COBIT elements (APO/DSS) to e-report-card and digital-platform governance in Malang City public senior high schools

Method

This study employs a qualitative descriptive-comparative multiple-case design involving seven public senior high schools in Malang City. The cases are treated as information-rich cases rather than as a statistically representative sample. Quantitative SNBP figures are used as contextual outcome evidence within the qualitative comparison. The unit of analysis is the school-level governance practice and its correspondence with publicly reported SNBP outcomes

The cases comprise SMAN 1, 3, 4, 5, 6, 8, and 10 Malang—seven of the ten public senior high schools in the city for which sufficiently verifiable public evidence could be identified. Case selection followed two criteria: (1) the school is a public senior high school within Malang City; and (2) relevant governance practices and/or SNBP outcome information could be verified through identifiable public sources. SMAN 2, 7, and 9 were not included because comparable public evidence could not be verified within the available dataset. The analysis therefore does not claim statistical representativeness of all ten schools.

The analytical instrument adapts selected elements of the APO (Align, Plan, Organize) and DSS (Deliver, Service, Support) domains of COBIT 2019. These domains were selected because the study focuses on strategic alignment, organization of information resources, service delivery, and support for academic-data systems rather than the full COBIT governance architecture. The four sensitizing indicators are: (a) documented school policies and strategies; (b) accountability structures and student-data mapping; (c) external stakeholder involvement; and (d) digital-platform and academic-data capabilities. Each documented practice was coded into one or more indicators and then interpreted through agency, stewardship, and stakeholder perspectives.

Data analysis proceeded in five stages. First, documents and reports were screened and

relevant evidence was extracted. Second, evidence was coded according to the four governance indicators. Third, codes were grouped into school-level governance profiles. Fourth, the profiles were compared across cases using the governance–outcome matrix in Tables 2 and 3. Fifth, patterns were interpreted through the three governance theories and selected COBIT elements. Triangulation was performed by comparing official school sources, official SNPMB information, and local-media reports where available. Media reports were treated as corroborative sources rather than substitutes for official records. The 2024 quota change is treated as a policy-related contextual factor affecting cross-year comparability, not as a statistically estimated confounder.

The publicly available data do not cover all public senior high schools in Malang City for every year from 2023 to 2025. In addition, the available SNBP figures are not fully comparable because schools differ in the size of their eligible cohorts, reporting practices, and admission categories. Some 2026 evidence is included only to contextualize emerging digital and AI-governance issues and does not redefine the primary study period. SNBP also represents only one university-admission pathway and should not be interpreted as a comprehensive measure of learning achievement. These limitations restrict causal inference and external validity.

Results and Discussion

SNBP Outcomes of Public Senior High Schools in Malang City, 2023–2026

Table 2. Publicly verifiable SNBP outcome evidence across selected public senior high schools in Malang City

School	SNBP Year	Publicly Verifiable Evidence	Source
SMAN 1 Malang	2024	58 of 131 eligible students	Suryamalang/Tribun news (2024)
SMAN 3 Malang	2026	44 students reported; the source indicates an aggregate figure including talent scouting and IUP, so it is not treated as a pure SNBP count	Ketik.com (2026)
SMAN 5 Malang	2024	63 students admitted via SNBP; highest reported figure among the publicly verifiable cases identified in this study	Radar Malang (2024)
SMAN 6 Malang	2023–2024	24 → 39 students; reported increase	Radar Malang (2024)
SMAN 10 Malang	2025	36 students admitted via SNBP	SMAN 10 Malang (2025)
SMAN 4 Malang	2024	Specific SNBP figure not publicly reported; evidence concerns the	Malang Posco Media (2024)

		Dream Career Profession Class	
SMAN 8 Malang	2026	Specific SNBP figure not publicly reported; evidence concerns student use of generative AI	Jurnal Pendas (2026)
Malang City aggregate	2023–2024	918 students reported in 2024; cross-year interpretation is limited by the national quota change	Suryamalang/Tribun news (2024)

Table 2 indicates that the aggregate decline in SNBP outcomes in Malang City from 2023 to 2024 (to 918 students) coincided with a reduction in the national SNBP quota from 30% to 20% (SNPMB, 2025). Therefore, the decline cannot automatically be attributed to a deterioration in school governance quality. Nevertheless, amid the national quota reduction, SMAN 6 Malang recorded an increase in admitted students from 24 to 39 during the same period (Radar Malang, 2024), a trend running counter to the citywide aggregate and therefore more plausibly associated with internal school factors rather than the national quota policy alone.

Governance and Achievement Matrix by School

Table 3. Governance practices and theoretical lenses across selected public senior high schools in Malang City.

School	Main Governance Practice	Governance Dimension	Theoretical Lens
SMAN 1	Study-program preference mapping by guidance counsellors with parents and students; scheduled strengthening of SNBT-related subjects	Accountability and data structures	Agency theory
SMAN 3	Google Workspace for Education, Belajar.id accounts, and teacher digital-literacy development	IT/digital capability	IT governance (COBIT–DSS)
SMAN 4	Dream Career Profession Class; partnerships with the Faculty of Medicine at Universitas Airlangga and other institutions; internship program	External partnerships	Stakeholder theory

SMAN 5	Three-year school-development strategy based on local-wisdom conservation and foreign-language strengthening	Sustained policy/strategy	Stewardship theory
SMAN 6	Three-year improvement trend in examination and SNBP outcomes	Continuous evaluation and improvement	Stewardship theory
SMAN 10	Transparent dissemination of SNBP outcomes through official school channels	Transparency and reporting	Stakeholder theory
SMAN 8	Student use of generative AI without identified formal school policy or oversight	Formal policy not yet identified	Emerging governance challenge from an agency perspective

The matrix indicates that the publicly reported SNBP outcomes observed in this study correspond with different combinations of governance practices, rather than with a single uniform model. SMAN 5 Malang is particularly informative because its reported outcome was associated with a sustained non-IT school-development strategy, suggesting that technology adoption should not be treated as a sufficient condition for governance quality. SMAN 3 Malang provides a contrasting case in which digital capability is more visible in learning governance. These cases suggest that organizational consistency and purpose may matter more analytically than the mere presence of technology. However, the study cannot determine whether these practices caused the reported differences in SNBP outcomes.

The SMAN 8 Malang case can be interpreted as an emerging governance challenge from an agency perspective: reported student use of generative AI appears to have developed faster than the formal institutional policy evidence identified in the study. The available evidence does not permit an assessment of whether this use improved or reduced academic outcomes. The case instead highlights the need for clear accountability, guidance, and institutional readiness when emerging technologies become part of student learning.

Novelty Compared with Previous SINTA-Indexed Studies

The contribution of this study is fourfold. First, it uses publicly verifiable SNBP evidence as an observable outcome around which school-governance practices can be compared, while explicitly recognizing the indicator's limitations. Second, it brings agency, stewardship, and stakeholder perspectives into a multi-case analysis of public senior high-school governance. Third, it integrates selected IT-governance concepts with organizational governance rather than treating digitalization as an independent technological variable. Fourth, it treats the national quota change as a policy-related contextual factor that limits cross-year comparison. The contribution is therefore best understood as an extension of

governance analysis to an educational context, rather than as a claim of causal impact or universal novelty.

Theoretical And Practical Implications

Theoretically, this study extends the discussion of governance from business organizations to public senior-high-school settings by combining organizational governance theories with selected IT-governance concepts. Practically, the findings suggest several areas for institutional attention: strengthening data-based study-program guidance; improving the accuracy and governance of academic data; developing purposeful partnerships with universities and other stakeholders; establishing clear institutional guidance for student and teacher use of AI; and improving transparent reporting of admission outcomes. These implications are presented as governance options derived from the cases, not as tested causal prescriptions.

Potential governance actions emerging from the cases include: (1) strengthening data-based study-program mapping for SNBP/SNBT preparation; (2) improving digital capability and academic-data accuracy; (3) developing external partnerships with universities and other institutions; (4) establishing clear internal guidance for AI use by students and teachers; and (5) improving transparent public reporting of SNBP/SNBT outcomes.

Strengthen digital capabilities and the accuracy of e-report-card data across schools, given the direct relationship between such data and student eligibility for SNBP.

Promote external partnerships with universities and industry following the SMAN 4 Malang model, while ensuring that such partnerships are not limited to schools with stronger alumni networks or more strategic locations.

Encourage all public senior high schools in Malang City to transparently publish SNBP/SNBT outcomes, following the practices observed at SMAN 10 and SMAN 3 Malang, so that achievement data can be publicly monitored and used by the Education Office for cross-school governance evaluation.

Research Limitations And Future Research Agenda

This study is limited by its coverage of seven of the ten public senior high schools in Malang City, incomplete annual public reporting, and the use of SNBP as only one university-admission pathway. Evidence for SMAN 4 and SMAN 8 does not include verified school-level SNBP figures, so those cases are interpreted primarily as governance-context cases rather than quantitatively comparable outcome cases. Future research should: (1) obtain missing SNBP/SNBT data through direct institutional access; (2) develop and validate a governance-maturity instrument based on the four sensitizing dimensions used here; and (3) examine SNBP, SNBT, and broader educational outcomes with a larger number of schools and explicit statistical controls for annual policy conditions.

Conclusion

This study identifies patterns of correspondence between publicly reported SNBP outcomes and school governance practices across seven selected public senior high schools in Malang City during 2023–2025. The findings can be interpreted through agency theory, which emphasizes accountability and student-data mapping; stewardship theory, which highlights consistent school-development strategies; stakeholder theory, which focuses on partnerships and transparency; and selected IT governance concepts related to digital platforms and academic-data management. SMAN 5 illustrates how a sustained non-IT development strategy can coexist with relatively high reported SNBP outcomes, while SMAN 3 highlights the role of digital infrastructure in school management. Meanwhile,

SMAN 8 illustrates an emerging governance challenge associated with generative AI. The change in the national SNBP quota in 2024 also limits direct comparisons across years. Overall, the findings demonstrate the value of an interdisciplinary governance perspective for examining school practices and SNBP outcomes. However, the study does not establish a causal relationship between governance practices and SNBP outcomes. Future quantitative research using complete school-level data is needed to test these observed patterns more rigorously.

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