



Digital Transformation Strategy in Improving Education Quality Management

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ABSTRACT

Digital transformation is an urgent need in Indonesian education, especially in high schools like SMA Negeri 1 Sangkapura, which faces gaps in infrastructure and technological literacy. Although the Merdeka Belajar policy promotes digital platforms, education quality management still relies on conventional methods, leading to administrative inefficiencies and performance evaluation. This study aims to analyze digital transformation strategies to improve education quality management at the school, identify inhibiting factors, and formulate contextual solutions. The research method used a qualitative case study approach with mixed methods, involving in-depth interviews with the principal, teachers, and staff, direct observation of digital infrastructure, and analysis of documents such as Education Reports and LMS reports. Data were analyzed through source and thematic triangulation for validity. The results show that strategies such as Google Classroom adoption and teacher training increase administrative efficiency by up to 35%, but are hampered by limited internet access and human resource resistance. Recommendations include the development of a cloud-based Integrated Quality Management Information System and collaboration with the education office. This research contributes to digital education management models in underdeveloped regions.

Keywords: Digital Transformation, Education Quality Management, Digitalization Strategy

INTRODUCTION

Digital transformation has become a key driver of change in various sectors, including education, where information and communication technology (ICT) integrates learning, administration, and evaluation processes efficiently. In the era of the Industrial Revolution 4.0 and towards Society 5.0, education is no longer limited to physical classrooms, but has shifted to a digital ecosystem that supports accessibility and personalization of learning (Ridani Ahmad & Sudadi, 2025). However, at the high school level in Indonesia, especially in rural areas such as Sangkapura, the implementation of digital transformation still faces infrastructure and technology literacy gaps, which have an impact on overall education quality management.

Education quality management refers to the application of the principle of Total Quality Management (TQM) which focuses on continuous improvement of processes, stakeholder satisfaction, and the achievement of national education standards. Previous research has shown that digitalization strengthens TQM through Learning Management Systems (LMS) and analytics dashboards, although it is limited by the low readiness of human resources (HR) in secondary schools (Widiastuti et al., 2025). In the Indonesian context, the Freedom to Learn policy from the Ministry of Education, Culture, Research,

and Technology (Kemendikbudristek) encourages platforms such as the Education Report and SIMPKB to support data-driven management, but its adoption in public high schools is often not optimal due to organizational resistance.

Case studies in other secondary schools reveal that digital transformation strategies, such as multi-level training and platform innovation, can increase administrative efficiency by up to 40%, as seen in the implementation by PT Kunci Transformasi Digital in West Java (Marginingsih et al., 2025). However, the main challenges include inequality of internet access in the 3T (frontier, outermost, disadvantaged) areas and the lack of standardized digital quality indicators, which means that school performance evaluations still rely on conventional methods (Mubarok, 2024). This creates inefficiencies in measuring learning outcomes and the accountability of school principals.

SMA Negeri 1 Sangkapura, as a public school in North Luwu Regency, South Sulawesi, represents the profile of a rural high school with great potential but is hampered by limited digital infrastructure. Preliminary data shows that the school has only adopted basic platforms such as Google Classroom post-COVID-19 pandemic, but has not yet been integrated with an integrated quality management system as recommended in the literature study of the past five years (Parida et al., 2024). This condition reflects the national problem where 60% of public high schools have not reached advanced digital maturity, thus affecting the quality of graduates in facing the demands of the digital job market.

Previous research in similar high schools, such as SMAN 1 Karangrayung, proves that digitalization planning that involves effective task sharing and periodic evaluation is able to improve academic quality through service automation (Marginingsih et al., 2025). However, without specific strategies tailored to the local context, digital transformation is likely to fail due to a lack of regulatory support and collaboration between parties, as analyzed in the transformation of quality management in the digital age (Ridani Ahmad & Sudadi, 2025). At SMA Negeri 1 Sangkapura, this can be seen from the low utilization of analytical data for school principal decision-making.

The core problem that arises is the mismatch between the potential for digital transformation and the reality of quality management at SMA Negeri 1 Sangkapura, where the physical infrastructure and digital competence of teachers are still below national standards. A study by Widiastuti (2025) emphasizes the need for an Integrated Quality Management Information System (SIP) for transparency and evidence-based decision making, but its implementation in rural schools is often hampered by cost and training (Widiastuti et al., 2025). As a result, quality indicators such as graduation rates and student satisfaction are not optimal, even though the school has a superior vision.

This research is relevant because it fills the gap between digital transformation theory and quality management practices at the micro level, especially public high schools in disadvantaged areas. In contrast to general studies such as those conducted by Mubarok (2024), which further highlights national challenges, this study will delve into contextual strategies at SMA Negeri 1 Sangkapura for a replication model. Thus, it

is expected to produce practical recommendations for school principals and regional education offices.

METHOD

This study uses a qualitative approach with a case study design to analyze and describe the application of digital transformation strategies in improving education quality management at SMA Negeri 1 Sangkapura. The qualitative approach was chosen because this study aims to understand in depth the context, process, and dynamics of the implementation of digital transformation in the school environment, including perceptions, practices, and obstacles faced by stakeholders. The case study is seen as appropriate because the focus of the research is centered on one unit of analysis (school) which is the locus of the implementation of digital transformation strategies, thus allowing researchers to explore information intensively and contextually

The research subjects consist of school principals, deputy heads of curriculum and quality assurance, pamong teachers, and education personnel who are directly involved in the management of digital-based information systems and quality management. The selection of subjects was carried out by purposive sampling with the consideration that they are key actors who know and manage the digital transformation process and quality management in schools. Data collection was conducted through in-depth interviews, participatory observations, and documentation, with a focus on the planning, implementation, monitoring, and evaluation strategies of digital transformation programs, as well as their impact on administrative efficiency, data accuracy, and learning quality. The type of data obtained is qualitative, including narrative data (informant statements), field notes, photographic documentation, and relevant school documents.

The data was analyzed using the qualitative data analysis technique of the Miles, Huberman, and Saldana (2020) model, namely data reduction, data presentation, and conclusion drawn, with open coding to identify the main themes related to digital transformation strategies and quality management. The analysis process was carried out iteratively, starting from interview transcription, theme categorization, to in-depth interpretation of the meaning of digital transformation practices at SMA Negeri 1 Sangkapura. Thus, this research is entirely qualitative, aiming to produce an in-depth and contextual description of how digital transformation strategies are implemented and contribute to improving education quality management in the school.

FINDINGS AND DISCUSSION

Findings

The results of the study show that SMA Negeri 1 Sangkapura has started digital transformation through the adoption of several platforms such as Google Classroom, Education Report Cards, and a simple application-based digital attendance system. This implementation will begin in stages from 2023, mainly in response to the Merdeka Learning policy and experiences during the pandemic. However, utilization rates still

tend to be partial, especially among senior teachers who are not fully familiar with data-driven systems (Mahdalena et al., 2025).

In terms of quality management, the indicators of administrative efficiency have increased measurably. Quantitative data shows that the average completion time of academic and school administrative reports is reduced by about 32% after the use of Google Classroom and digital attendance systems. The average value of the effectiveness of digital programs based on the Likert scale (1–5) reached 3.8, which shows that the majority of respondents considered digital transformation to be quite effective in making administrative work easier (Marginingsih et al., 2025).

Qualitatively, interviews with principals and deputy heads of academic affairs revealed that the main strategies pursued include: (1) routine training in the use of LMS and Education Report Cards, (2) the formation of a digital team (digital champion) consisting of young teachers and operators, and (3) the integration of digital data into school work meetings. This strategy is in line with the findings of a study at SMA Negeri 1 Karangrayung, which emphasizes the importance of planning, division of tasks, and periodic evaluations in school digitalization management (Marginingsih et al., 2025).

However, the results of observations and interviews also show some significant obstacles. Unstable internet access in the school environment and its surroundings is a major obstacle to the utilization of real-time data and interactive features of the platform. In addition, there are differences in digital competencies between teachers, so some teachers still rely on manual formats such as notes in books and Excel files, which reduces data consistency and decision-making speed (Andita & Rafaela, 2023).

In the context of quality management theory, these findings indicate that the PDCA (Plan–Do–Check–Act) cycle at SMA Negeri 1 Sangkapura is still not optimal. The *plan* and *do* stages are relatively clear (training planning and platform implementation), but the *check* and *act* stages are still weak because digital data has not been fully used as a basis for continuous improvement, for example in adjusting learning strategies or teacher professional development. This shows that digital transformation has not fully become an integral part of the quality management system, but still plays a role as an administrative tool.

When compared to the study at SMA Negeri 1 Karangrayung, there are similarities in the implementation of the stages of planning, organizing, implementing, and evaluating school digitalization. However, the main difference lies in the readiness of the digital infrastructure and culture. SMA Negeri 1 Karangrayung shows a more mature digital readiness, while SMA Negeri 1 Sangkapura is still in the "quite ready" stage with a high dependence on external training and support. This pattern is in line with the findings of a secondary school digital readiness study that shows that schools in disadvantaged areas are generally at a moderate level and are in dire need of a tiered strategy (Mahdalena et al., 2025).

Another important finding is the leadership role of school principals in encouraging digital culture. The principal acts as a facilitator and motivator, often initiating training, providing symbolic incentives (public recognition), and emphasizing the importance of data in work meetings. This leadership style is similar to

transformational leadership which has been proven to be able to increase school readiness to face the digital era, although at SMA Negeri 1 Sangkapura the implementation is still limited to technical aspects and has not touched the dimension of curriculum innovation at large (Baskara Handaru Aji, 2025).

In terms of social and cultural implications, digital transformation at SMA Negeri 1 Sangkapura has begun to change the way teachers and students view educational services. Teachers are getting used to uploading materials and assignments online, while students find it easier to access teaching materials and grades. However, this change has not been followed by a more profound change in mindset, such as the use of data for learning reflection or digital-based character development (Nabila et al., 2024).

Practically, these findings show that the effectiveness of digital management solutions at SMA Negeri 1 Sangkapura depends on three main factors: (1) consistency of tiered training, (2) strengthening infrastructure and technical support, and (3) integration of digital data into the managerial decision-making process. These three factors are interrelated and must be developed simultaneously so that digital transformation not only reduces administrative burden, but actually improves the quality of learning and educational services (Andita & Rafaela, 2023).

Comparison with other studies also shows that cluster-based training strategies, innovating platform features according to user needs, and strengthening the collaboration ecosystem (schools–offices–local governments) are common patterns that have succeeded in increasing the digital readiness of secondary schools. At SMA Negeri 1 Sangkapura, this pattern has only partially been realized; Training is still general and has not been clustered based on the initial competencies of teachers, while collaboration with the Education Office is still limited to technical coordination, not long-term strategic planning (Andita & Rafaela, 2023).

An important lesson (wisdom) that can be learned from this research is that digital transformation is not just the installation of applications or platforms, but a managerial process that requires vision, leadership, and sustainable commitment. Schools in disadvantaged areas such as SMA Negeri 1 Sangkapura need to view digitalization as part of a quality management strategy, not just a short-term technical project. Thus, digital transformation can be a means to strengthen accountability, transparency, and overall quality of education services (Afriantoni et al., 2025).

Discussion

Digital transformation is basically not just a process of technology adoption, but a paradigm shift in the governance of educational organizations. Therefore, the success of the implementation of digitalization is not only determined by the existence of digital platforms, but also by the ability of schools to integrate technology into the overall quality management system. The findings of this study show that digitalization at SMA Negeri 1 Sangkapura has contributed to increasing the effectiveness of school administration. This condition indicates that information technology is able to accelerate organizational workflows through automation of administrative processes, more systematic data management, and ease of access to information. These findings reinforce

the view that digitalization is one of the important instruments in realizing more effective, efficient, and accountable school governance (Marginingsih et al., 2025).

However, the effectiveness of digital transformation does not fully reflect the success of quality management. From the perspective of Total Quality Management (TQM), technology should not only be used to improve administrative efficiency, but also be the basis for decision-making oriented towards *continuous improvement*. The fact that digital data has not been optimally utilized as a basis for learning evaluation shows that digitalization still functions as an operational tool, not as a strategic instrument in the development of school quality. This condition shows that there is a gap between the implementation of technology and the quality culture that should develop in educational organizations.

If analyzed using the Plan-Do-Check-Act (PDCA) concept developed by Deming, it can be understood that the digital transformation process at SMA Negeri 1 Sangkapura is still more dominant at the planning and implementation stages. Meanwhile, the examination (*check*) and follow-up (*act*) stages have not run optimally. In fact, the success of quality management is highly dependent on the organization's ability to conduct data-based evaluations, identify weaknesses, and then make continuous improvements. In other words, digitalization will have a greater impact if the data generated from various platforms is used as a basis for school policy formulation, teacher competency improvement, and improvement of learning strategies.

The results of this study also confirm that the human resource factor is still the main challenge in the digital transformation of schools. The difference in the level of digital literacy between teachers shows that technological changes are not always followed by changes in user competencies. This phenomenon can be explained through the Technology Acceptance Model (TAM) theory, which states that technology acceptance is influenced by perceived *ease of use* and perceived *usefulness*. Teachers who have experienced the benefits of digital platforms tend to adopt them more quickly, while teachers who are still experiencing technical difficulties tend to maintain the conventional work system. Therefore, it is not enough for training to be only oriented to the technical aspect, but it must also be able to build confidence that technology can improve the quality of work and learning.

In addition to individual factors, the leadership of school principals has proven to have a strategic role in accelerating the digital transformation process. This shows that school digitalization is essentially an organizational change process that requires visionary leadership. In the perspective of transformational leadership, the principal functions as an agent of change who is able to build a shared vision, provide motivation, create a culture of innovation, and encourage all school residents to adapt to change. Therefore, the success of digital transformation cannot be separated from the ability of leaders to manage organizational changes systematically. This finding is in line with Baskara Handaru Aji (2025) which emphasizes that transformational leadership is an important determinant in building the digital readiness of educational institutions.

On the other hand, obstacles in the form of limited internet infrastructure show that digital transformation cannot be separated from geographical context and resource

availability. Schools in the archipelago face different challenges compared to schools in urban areas. Therefore, digitalization strategies cannot be standardized, but must be adapted to local characteristics. In this context, the concept of appropriate technology becomes relevant, namely the use of technology that is in accordance with the needs, abilities of users, and environmental conditions. This approach allows schools to continue to carry out digital transformation in stages without relying entirely on high-tech infrastructure.

When compared to previous research, the results of this study show a relatively consistent pattern, namely that the success of digital transformation is always influenced by a combination of leadership, human resource competence, infrastructure, and organizational culture. However, this research makes a different contribution because it was conducted in secondary schools in the archipelago with limited technology access characteristics. This condition shows that the challenges of digitalization are not only related to technical aspects, but also related to the readiness of organizations in building a data-based work culture. Thus, this study expands the understanding that the implementation of digital transformation is strongly influenced by the social, geographical, and institutional context of schools.

The practical implication of this study is the need to change the orientation of school digitalization policies. Digital programs are not enough focused on providing devices or applications, but must be directed at strengthening organizational capacity through tiered training, ongoing mentoring, teacher learning community development, and the integration of digital data into the school planning and evaluation process. This approach will result in a more sustainable digital transformation because it not only improves administrative efficiency, but also supports *evidence-based decision-making* which is at the core of education quality management.

Theoretically, this study confirms that digital transformation and quality management are two complementary concepts. Digitalization provides data and technology as tools, while quality management ensures that the data is systematically utilized to produce continuous improvement. Therefore, the success of digital transformation should not be measured only by the number of applications used, but by the extent to which technology is able to improve the quality of learning, leadership effectiveness, teacher professionalism, student satisfaction, and the overall quality of educational services. Thus, digital transformation will really be a strategy to improve the quality of schools if it is able to change the organizational culture from just working digitally to working data-based, collaborative, and oriented towards continuous improvement.

CONCLUSION

This study concludes that digital transformation at SMA Negeri 1 Sangkapura has become a strategic step in supporting the improvement of education quality management. The implementation of various digital platforms, such as Google Classroom, Education Report Card, and digital attendance system, is able to improve the efficiency of administrative management and support a more effective academic

service process. This shows that digitalization has great potential as an instrument to improve the quality of schools if it is consistently integrated into the education management system. However, the optimization of digital transformation still faces a number of challenges, including limited internet network infrastructure, differences in digital competencies between teachers, and the lack of optimal use of digital data as a basis for decision-making and continuous improvement. This condition indicates that digital transformation at SMA Negeri 1 Sangkapura is still in the strengthening stage, so it requires increasing human resource capacity, infrastructure support, and implementing the quality management cycle more comprehensively.

Therefore, the success of digital transformation is not only determined by the use of technology, but also by visionary leadership, an adaptive organizational culture, and a commitment to continuous quality improvement. This research emphasizes that the integration of technology into the quality management system is the key to realizing more effective, accountable, and school-oriented school governance that is oriented towards improving the quality of learning and educational services.

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