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Enhancing Sustainable Education through Strategic Information System Planning: A Case Study of Digital Learning Implementation at SMP Islam Darussalam

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Abstract

This study aims to design a strategic information system plan to support digital learning implementation at SMP Islam Darussalam using the Ward and Peppard approach. The current implementation of e-learning at SMP Islam Darussalam is not yet optimal due to the absence of a well-defined strategic plan, resulting in misalignment between systems and user needs. Previous studies on IS/IT strategic planning have mainly focused on universities and business organizations, while limited research discusses its implementation in Islamic junior high schools. This study employs a qualitative case study approach. Data were collected through interviews, observations, and documentation. The analysis applies the Ward and Peppard framework, supported by SWOT, Value Chain, PEST, Porter's Five Forces, and McFarlan Strategic Grid analyses. The results show that the approach effectively identifies organizational needs and formulates IS/IT strategies aligned with institutional goals. The study produces recommendations in the form of an application portfolio and development roadmap focusing on a Learning Management System (LMS), an online examination system, and a student performance analysis system to support sustainable digital learning implementation.

[Penelitian ini bertujuan untuk merancang perencanaan strategis sistem informasi guna mendukung implementasi pembelajaran digital di SMP Islam Darussalam menggunakan pendekatan Ward and Peppard. Implementasi e-learning di SMP Islam Darussalam saat ini masih belum optimal karena belum adanya perencanaan strategis yang terstruktur, sehingga menyebabkan ketidaksesuaian antara sistem dan kebutuhan pengguna. Penelitian sebelumnya mengenai perencanaan strategis SI/TI sebagian besar berfokus pada perguruan tinggi dan organisasi bisnis, sementara penelitian pada tingkat sekolah menengah Islam masih terbatas. Penelitian ini menggunakan pendekatan kualitatif dengan metode studi kasus. Data dikumpulkan melalui wawancara, observasi, dan dokumentasi. Analisis dilakukan menggunakan framework Ward and Peppard yang didukung oleh analisis SWOT, Value Chain, PEST, Porter's Five Forces, dan McFarlan Strategic Grid. Hasil penelitian menunjukkan bahwa pendekatan tersebut efektif dalam mengidentifikasi kebutuhan organisasi dan merumuskan strategi SI/TI yang selaras dengan tujuan institusi. Penelitian ini menghasilkan rekomendasi berupa portofolio aplikasi dan roadmap pengembangan yang berfokus pada Learning Management System (LMS), sistem ujian online, dan sistem analisis hasil belajar siswa guna mendukung implementasi pembelajaran digital yang berkelanjutan.] © The Authors.

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1. Introduction

In this rapidly evolving era of digital transformation, the use of Information Systems (IS) and Information Technology (IT) has expanded into various sectors, including education. Educational institutions are required to adapt to technological advancements in order to improve service quality, enhance the effectiveness of the learning process, and increase operational efficiency. In line with this, education has also become a key focus of the Sustainable Development Goals, particularly in ensuring inclusive, high-quality, and sustainable education [1]. Therefore, the integration of information technology into the education system is viewed as a strategic step to support Education for Sustainable Development (ESD), through improved accessibility, learning flexibility, and efficiency in resource utilization. The use of IS/IT in education has provided various benefits, including improving learning effectiveness, expanding access to education, and reducing dependence on conventional paper-based media [2][3][4]. Furthermore, the use of technology also enables educational institutions to manage data and information more accurately, quickly, and in an integrated manner. Thus, the implementation of IS/IT not only serves as an operational support tool but also acts as a key driver in the transformation of education toward a more modern and sustainable system.

One form of IS/IT implementation that is a key focus in the digital transformation of education is e-learning. E-learning serves not only as a digital learning medium but also as a strategy for improving the quality and flexibility of learning[5][6][7]. Additionally, e-learning supports sustainability principles by reducing paper usage and enhancing efficiency in the learning process. One school that has implemented e-learning to support its learning process is SMP Islam Darussalam. However, although the system plays a crucial role in supporting academic activities, its implementation remains suboptimal. A lack of coordination in e-learning planning within the school environment has resulted in the implemented system failing to fully support learning objectives. This is due to a lack of alignment between the information technology administrators and school management. Consequently, various challenges have emerged, such as a lack of integration between systems, mismatched features with user needs, and the system's failure to be fully utilized in supporting comprehensive digital learning. This situation indicates that the implementation of e-learning in schools has not yet been able to provide significant added value to the digital learning process. These findings indicate that the implementation of IS/IT in schools is not yet fully aligned with the institution's strategies and needs. Meanwhile, alignment between IS/IT strategies and organizational goals can be achieved through effective communication and collaboration between IT managers and all parties involved in school operations [8][9][10][11].

The situation faced by SMP Islam Darussalam is also common in many other schools. Many educational institutions face similar problems, where the implementation of e-learning is not yet fully aligned with organizational goals. This prevents the objectives of e-learning implementation from being optimally achieved and has the potential to hinder the effectiveness of the ongoing teaching and learning process. These issues not only impact technical aspects but also affect the organization's overall performance. Non-integrated systems can lead to data duplication, information inconsistencies, and increased administrative workload[12][13]. These findings certainly do not align with the school's expectations regarding e-learning implementation. One of the primary causes of the ineffective implementation of e-learning is the absence of a comprehensive strategic IT/IS plan, as well as a lack of understanding regarding the importance of alignment between technology and organizational objectives. The success of e-learning implementation fundamentally depends on thorough strategic planning[14]. However, the limited knowledge schools possess regarding IS/IT strategic planning often leads to difficulties in identifying and developing information systems that align with their needs. If this misalignment persists, it may result in a decline in the quality of educational services provided. This alignment issue is also closely related to the organization's level of readiness and its existing information technology capabilities. Therefore, sound strategic IS/IT planning is necessary to ensure the organization's readiness to implement technology optimally[15][16].

Given the various challenges faced by SMP Islam Darussalam in the current implementation of e-learning, the school plans to develop a Learning Management System (LMS) to support a more integrated and effective learning process, as well as to address the shortcomings of the previous e-learning system. However, developing a new system without thorough planning risks repeating the same problems encountered with the previous system. This situation aligns with various research findings indicating that e-learning implementation in educational institutions often fails to operate optimally due to resource constraints, low digital literacy, insufficient managerial support, and the lack of system integration[17][18][19]. Additionally, many educational institutions adopt technology

merely to follow digital trends without considering alignment with organizational needs and objectives. Consequently, the developed systems are unable to optimally support business processes and struggle to provide significant added value to the organization[20][21][22]. Therefore, the implementation of information technology cannot be carried out on an ad hoc basis but requires strategic IS/IT planning capable of guiding technology utilization to align with the organization's vision and mission.

Strategic IS/IT planning enables organizations to accurately identify needs, determine development priorities, and develop a focused and sustainable application portfolio and implementation roadmap[23][24][25]. In the context of educational institutions, strategic planning is particularly important because the educational environment is dynamic, involves many stakeholders, and requires alignment between academic and administrative needs. Without proper planning, technology implementation risks failing to meet user needs and may be difficult to optimize to support the learning process. Furthermore, the adoption of information technology should also be viewed as a strategic investment expected to provide added value in the form of improved efficiency, effectiveness, and the quality of educational services [26][27][28]. Therefore, every decision in information system development, including LMS, must be carefully planned to ensure that the investment does not result in waste but instead provides long-term benefits for the educational institution. To support this planning process, a systematic and comprehensive approach is required. One widely used method is the Ward and Peppard framework, which excels at integrating business environment and information technology analysis, both from the internal and external perspectives of the organization. This approach helps organizations identify strategic needs, evaluate existing IS/IT conditions, and formulate development strategies aligned with organizational goals. Additionally, this method produces an application portfolio and implementation plan that can serve as a reference for sustainable information system development [8][29][30][31]. However, studies discussing the implementation of the Ward and Peppard framework in Islamic junior high schools, particularly to support digital learning and LMS development, are still limited.

Based on the above discussion, it is evident that research on strategic planning for information systems and information technology has been extensively conducted; however, the majority of studies still focus on the application of methods without linking them to the context of sustainable education. Furthermore, research specifically addressing the role of IS/IT strategic planning in supporting e-learning development at the secondary school level remains limited. This situation indicates a need for research that not only focuses on IS/IT planning but also integrates it with the development of sustainable digital learning. In IS/IT strategic planning, various approaches can be employed; one of them is the Ward and Peppard framework, which comprehensively integrates business environment and information technology analysis from both internal and external organizational perspectives [24][32][33]. Therefore, this study aims to design a strategic information systems plan to support the development of a Learning Management System (LMS) at SMP Islam Darussalam using the Ward and Peppard approach. This study is expected to produce an IS/IT strategy that aligns with the organization's needs and supports the improvement of sustainable learning quality.

2. Method

Strategic planning for information systems and information technology (IS/IT) is an approach used to determine the direction of IS/IT development so that it aligns with organizational objectives. Through this planning, organizations can identify information system needs in a more structured manner and generate strategic recommendations that support the achievement of organizational objectives [8][24][30][31][34]. In this study, the method used is based on the Strategic Information Systems Planning (SISP) model by Ward and Peppard. This method was selected for its ability to comprehensively analyze organizational needs from both business and IS/IT perspectives, encompassing both internal and external aspects.

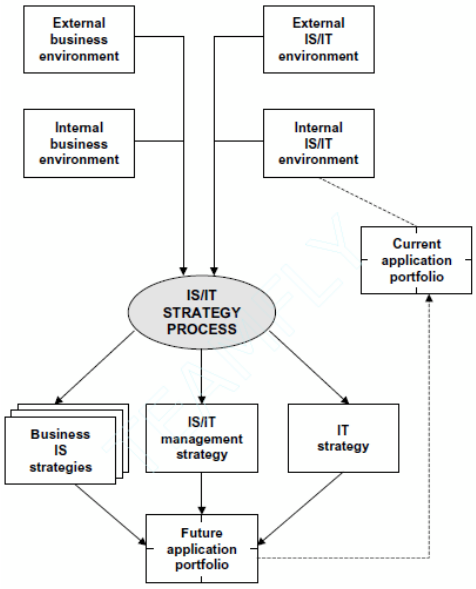

Figure 1. Ward and Peppard Strategic Information Systems Planning Model [30][31][34]

This study adopts a qualitative approach using a case study method at SMP Islam Darussalam. Data were collected through interviews, observations, and documentation. Interviews were conducted with school management, teachers, and information system administrators to obtain insights into the current e-learning implementation and future system development needs. Observations were carried out to understand the existing learning business processes, while documentation was used to support data related to organizational structure, policies, and existing systems.

The strategic information systems planning in this study follows the Ward and Peppard Strategic Information Systems Planning (SISP) Model, which consists of two main stages: input and output. The input stage involves several analytical processes to understand the organizational condition. Internal business environment analysis is conducted to identify organizational strengths and weaknesses using SWOT and Value Chain methods to examine primary and supporting activities in the school's learning process. External business environment analysis is applied to identify opportunities and threats from outside the organization through PEST and Porter's Five Forces analyses to understand the educational environment and competitive landscape. In addition, internal IS/IT environment analysis evaluates the current information systems in use, including the existing e-learning system and its utilization in supporting learning activities. External IS/IT environment analysis is also conducted to identify technology trends and opportunities for system development, particularly in the implementation of a Learning Management System (LMS).

The next stage is the output stage, where the results of the analyses are used to formulate IS/IT strategies. The outputs consist of IS business strategy, IT strategy, and IS/IT management strategy. The IS business strategy focuses on the use of IS/IT to support learning processes and academic needs. The IT strategy includes the development of infrastructure and technology required to support system implementation, while the IS/IT management strategy covers policies and governance to ensure effective management of IS/IT resources.

3. Results

Data and information in this study were collected through interviews and observations. The informants involved include school management, teachers, and staff responsible for managing information systems at SMP Islam Darussalam. The selection of these informants is based on their direct involvement in business processes and the utilization of information systems within the school environment. In strategic IS/IT planning, there are two key roles that play an important part, namely parties who understand the technical aspects of information technology such as systems, infrastructure, and applications, and parties who understand the organization's business processes and operational needs. These roles are essential to ensure that the formulated IS/IT strategy aligns with organizational requirements.

Based on the analysis of the vision, mission, and objectives of SMP Islam Darussalam, it is identified that the school aims to improve the quality of educational services through the utilization of technology in the learning process. The results of this analysis serve as the foundation for formulating IS/IT strategies that support more effective and efficient learning processes. In developing the IS/IT strategy, this study is conducted through two main stages, namely the input stage and the output stage.

3.1. Input Stage

3.1.1 Internal Business Environment Analysis

In accordance with the Ward and Peppard model, the next step is to analyze the organization's business condition from an internal perspective. In this study, the internal business environment analysis is carried out using several approaches, namely Critical Success Factors (CSF), SWOT analysis, and Value Chain analysis. The CSF analysis is used to identify key factors that determine the organization's success in achieving its objectives. Based on the analysis, it is found that the success of SMP Islam Darussalam is influenced by the quality of the learning process, the availability of information systems that support academic activities, and the capability of human resources in utilizing technology. The detailed results can be seen in Figure 2.

Main Objectives	Strategies	Strategic Programs	CSF
Improving the Quality of Islamic-Based Education	Improvement of Islamic-based curriculum	Revision and enhancement of the Islamic-based curriculum	High-quality Islamic curriculum aligned with the Merdeka Curriculum
	Professional development training for teaching and educational staff	Regular training programs for teachers and staff	
Integration of Educational Technology	Increase access to and use of technology	Provision of equipment and technology training	Effective use of technology in education
	Integrate technology into the learning process	Development of online learning or e-learning platforms	
Diversification of Extracurricular Programs	Identify students' interests and talents	Development of diverse extracurricular programs	Variety of extracurricular activities
	Encourage student participation in program planning	Student involvement in program development	
Development of Leadership and Teacher Well-being	Leadership training for teaching staff	Regular leadership training programs	Supervision for improving teaching quality of teachers and staff
	Monitoring and evaluation of teacher well-being, supervision programs	Emotional and professional support programs for teachers and staff	
School Promotion and Marketing	Development of marketing strategies	Collaboration with local media and marketing institutions	Effective strategies to achieve student enrollment targets
	Participation in educational workshops		
Improving Student Learning Outcomes	Analysis of test items for each subject	Development of computer-based applications	Improved evaluation of student learning outcomes
	Increased use of information systems/technology in assessments	Faster grading of student learning outcomes	
Improving Student Services and Satisfaction	Implementation of counseling and student support programs	Provision of effective counseling services	Improved student services and satisfaction

Figure 2. Main Objectives and CSF Analysis

Furthermore, SWOT analysis is used to identify the organization's strengths, weaknesses, opportunities, and threats. The results indicate that SMP Islam Darussalam has strengths in its commitment to utilizing technology in learning and its support for digital transformation in education. However, several weaknesses are identified, such as the lack of system integration and the limited ability of users to optimally utilize technology. The detailed results can be seen in Figure 3

SWOT ANALYSIS	Strength	Weakness
	Having a strong foundation of Islamic values, creating an environment that supports students' character development.	Limited financial resources that may restrict the development of facilities and extracurricular programs.
	Having a team of competent and experienced teachers in delivering the curriculum and Islamic values.	Limited facilities that hinder comfort and the continuity of extracurricular learning processes.
	Providing a safe and technology-based learning atmosphere to support students' learning development.	Lack of program diversification, including limited variety in extracurricular and non-academic activities.
	Providing a curriculum that integrates Islamic values in every aspect of learning and incorporates the Merdeka Curriculum to promote diversity across different ethnicities and cultures.	
Opportunities	**SO Strategies**	**WO Strategies**
Utilization of educational technology to improve teaching methods and expand access to learning resources.	Develop and utilize technology comprehensively to support information management in the learning process and school operations.	Conduct an assessment of inventory asset management to be further developed, either as facilities/infrastructure or as business units.
Building partnerships with local communities to support extracurricular activities and student development programs.	Continuously improve and maintain the school's reputation and conduct proper and effective promotion.	Utilize technology comprehensively within the school environment to enhance the learning process.
Development of creative programs by introducing innovative activities such as seminars, workshops, or student exchange programs to increase the school's attractiveness.	Recruit competent educators and conduct training and development of human resources.	Optimize human resource management by utilizing information systems and technology (IS/IT).
Threats	**ST Strategies**	**WT Strategies**
Competition with other educational institutions in attracting students and resources.	Develop school programs and improve human resources to achieve good accreditation.	Improve the quality and service standards of the school.
Changes in education policies that may affect curriculum structure or academic requirements.	Optimize the use of information systems and technology (IS/IT) in schools to keep up with technological developments that affect teaching quality.	Optimize and further develop the current use of information systems and technology (IS/IT).
Difficulty in keeping up with technological advancements that may impact teaching quality.	Provide training and development for existing human resources to become more competent and reliable.	Maximize the potential of existing human resources and provide continuous development to enhance their capabilities.

Figure 3. SWOT Analysis

In addition, Value Chain analysis is conducted to identify primary and support activities within the organization. The results show that primary activities, such as the learning process, evaluation, and academic management, are highly dependent on information system support. Meanwhile, support activities, including infrastructure management and human resource management, play an important role in ensuring smooth school operations. The detailed results can be seen in Figure 4

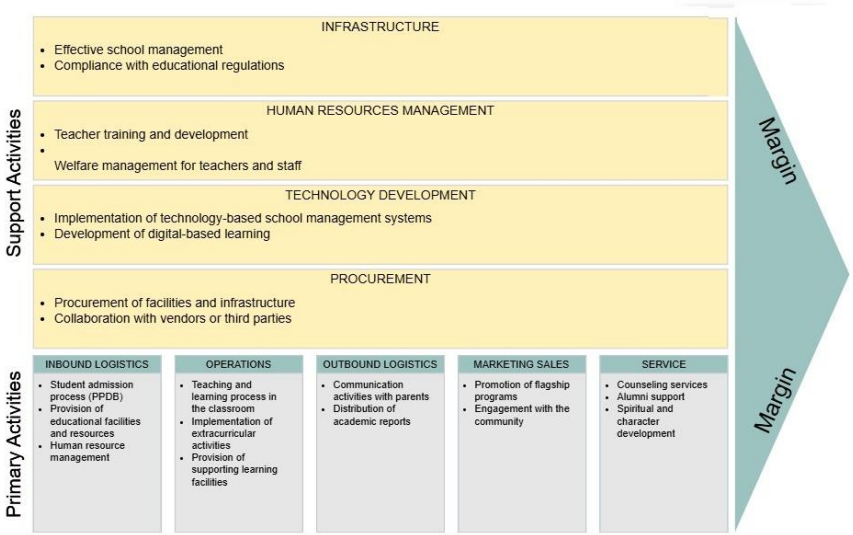

Figure 4. Value Chain Analysis

Based on the overall results of the internal business environment analysis, it can be concluded that SMP Islam Darussalam has established a solid foundation in utilizing technology. However, further development of integrated information systems is required to optimally support business activities.

3.1.2 External Business Environment Analysis

In analyzing business conditions, it is important to consider not only the internal environment but also the external business environment. This analysis aims to identify external factors that influence organizational operations, including stakeholder behavior, competition, and industry conditions. Based on the external business environment analysis using the PEST framework, it is identified that technological advancements and changes in learning behavior significantly influence the development of information systems at SMP Islam Darussalam. The increasing adoption of digital learning creates opportunities for the school to enhance its educational services, while at the same time requiring adaptation to more flexible and technology-driven learning models. The detailed results of the PEST analysis are presented in Figure 5.

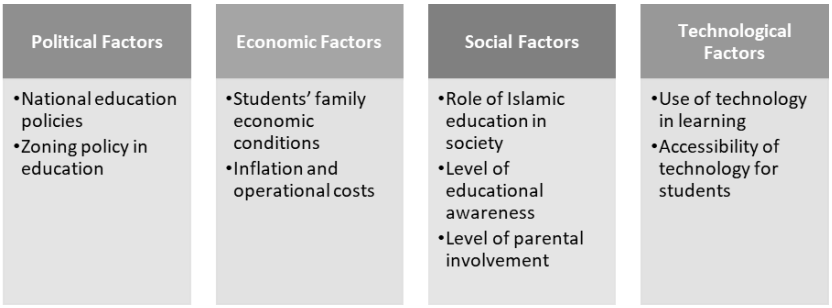

Figure 5. PEST Analysis

Furthermore, Porter's Five Forces analysis indicates that competitive pressure arises from other educational institutions as well as alternative education services that offer more innovative learning approaches. This condition may influence students and parents in selecting educational institutions that better meet their expectations. In addition, the availability of alternative learning platforms increases the level of competition in the education sector. If these external pressures are not properly addressed, they may affect the school's ability to maintain competitiveness and meet stakeholder expectations. Therefore, it is necessary for the organization to respond strategically to these conditions in order to ensure that IS/IT implementation remains aligned with organizational objectives. The results of Porter's Five Forces analysis are illustrated in Figure 6.

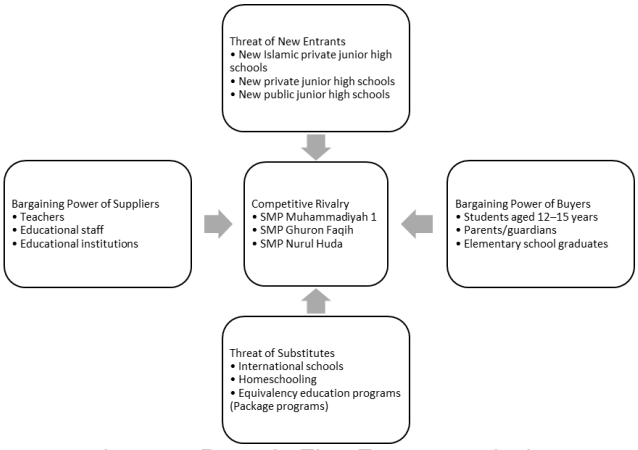

Figure 6. Porter's Five Forces Analysis

3.1.3 Internal IS/IT Environment Analysis

Following the analysis of the business environment, the next step is to examine the existing IS/IT conditions within the organization. This analysis is conducted to evaluate the current state of information systems and technology at SMP Islam Darussalam. From the technological perspective,

the school is supported by several hardware components, including personal computers, laptops, projectors, printers, scanners, and smartphones.

Table 1. IT Infrastructure

No	Hardware	Quantity
1	Personal Computer (PC)	15 units
2	Laptop	3 units
3	Projector	3 units
4	Printer	3 units
5	Scanner	1 unit
6	Smartphone	2 units

These devices support teaching and learning, administrative processes, and organizational communication. Their availability indicates that the school has basic technological support. However, the limited number of devices may restrict optimal use of information systems, particularly for large-scale digital learning. From the application perspective, SMP Islam Darussalam uses various software to support academic and operational activities, including Moodle, Zoom Workplace, Google Chrome, and Microsoft Office (Word, Excel, and PowerPoint). Design and multimedia tools such as Canva, Adobe Photoshop, Premiere Pro, and CorelDraw are used for content creation. The school also uses Visual Studio Code and XAMPP for system development and web-based applications. Further details are presented in Table 2.

Table 2. List of Information Systems Applications

No	Application Name	Main Function
1	Moodle	Supports web-based learning management system
2	Zoom Workplace	Supports online meetings and virtual learning
3	Google Chrome	Provides access to web-based systems and information
4	Canva	Supports digital content and design creation
5	Microsoft Office (Word, Excel, PowerPoint)	Supports document processing and academic administration
6	Adobe Photoshop & Premiere Pro	Supports multimedia content creation
7	CorelDraw	Supports vector-based graphic design
8	Visual Studio Code	Supports system and web development
9	XAMPP	Supports local web and database development

Although a variety of applications have been implemented, most of them operate independently and are not fully integrated. This condition may limit the efficiency of information flow and reduce the effectiveness of system support across organizational processes. Overall, the findings indicate that while SMP Islam Darussalam has adopted various information systems and technologies, improvements are still required in terms of system integration and infrastructure optimization to better support organizational needs.

3.1.4 External IS/IT Environment Analysis

The final step of the analysis examines the external IS/IT environment to identify technological trends influencing system development at SMP Islam Darussalam. The findings indicate that rapid advancements in mobile technology and internet accessibility have transformed the delivery of educational services, enabling users to access information and participate in digital learning anytime and anywhere. Additionally, technologies such as Learning Management Systems (LMS), cloud services, and online communication platforms are increasingly adopted in education, supporting more flexible, efficient, and interactive learning processes. The growing familiarity of users with digital platforms also encourages institutions to implement more user-friendly systems. However, these developments require continuous adaptation to remain relevant and competitive. Therefore, understanding external IS/IT trends is essential to ensure that future system development aligns with user needs and technological advancements.

3.2. Output Stage

After obtaining the results from the input stage, the next step is to formulate IS/IT strategies that align with the organizational conditions of SMP Islam Darussalam. In this stage, the proposed IS strategy is further mapped and translated into an application portfolio. The development of the application portfolio is carried out using the McFarlan Strategic Grid, which is used to classify applications based on their contribution to organizational operations and strategic objectives.

3.2.1 IS/IT Strategy Mapping

ased on the analysis of internal and external business and IS/IT environments, an IS/IT strategy mapping is developed in line with the objectives of SMP Islam Darussalam. The results of CSF, SWOT, and Value Chain analyses, combined with external business and technological factors, identify critical business needs that must be supported by information systems. These needs are translated into strategic solutions in the form of system development and enhancement aligned with organizational goals.

The strategies are categorized into three components: IS business strategy, IS/IT management strategy, and IT strategy. The IS business strategy focuses on supporting core processes to improve educational service quality. The IS/IT management strategy ensures proper governance through risk, security, change, and asset management. Meanwhile, the IT strategy provides the infrastructure and technology required for optimal system performance. The overall IS/IT strategy mapping is presented in Table 3.

Table 3. IS/IT Strategy Mapping

Strategy Category	Strategic Focus	Description
IS Business Strategy	Development of academic and learning systems	Focuses on developing and improving information systems that support core educational processes, such as e-learning, academic management, student services, and evaluation systems to enhance education quality and user satisfaction.
IS/IT Management Strategy	IT governance and system management	Focuses on strengthening IS/IT governance through the establishment of IT management processes, including risk management, security management, change management, and asset management to ensure effective and sustainable system implementation.
IT Strategy	Infrastructure and technology support	Focuses on improving IT infrastructure, optimizing hardware and software, adopting web-based technologies, and enhancing network security to support system integration and operational efficiency.

Based on the formulated IS strategy, a more detailed identification of information system solutions is then conducted. This process refers to the results of CSF, SWOT, and Value Chain analyses, as well as external business and IS/IT environment considerations, ensuring that each proposed system is aligned with organizational needs and technological developments. The result of this process is a set of proposed information system solutions designed to support both primary and supporting activities within the organization. Each solution is mapped based on the business needs it supports and the analytical sources that justify its development. The mapping of information system solutions is presented in Table 4.

Table 4. Mapping of IS Requirements to IS Solutions

IS Code	IS Solution	Supported Requirements	Source of Analysis
SI01	E-Learning Information System	Provision of digital learning materials and online learning support	CSF, Value Chain (Primary & Support Activities)
SI02	Extracurricular Information System	Management and recording of extracurricular activities	CSF, Value Chain
SI03	Teacher and Staff Information System	Competency assessment, management, and welfare of teachers and staff	CSF, Value Chain (Support)
SI04	School Website / CRM	School information services, promotion, and stakeholder relationship management	CSF, Value Chain
SI05	Quality Assurance Information System	Evaluation, control, and improvement of educational quality	CSF, SWOT (SO, WT)
SI06	Online Examination Information System	Question analysis and digital examination implementation	CSF, Value Chain
SI07	IS/IT Monitoring Information System	Monitoring and evaluation of IS/IT development and utilization	SWOT (SO, WO, ST, WT)
SI08	Human Resource Management Information System	Recruitment, management, training, and development of human resources	SWOT, Value Chain
SI09	Facilities and Infrastructure Information System	Management and control of facilities and infrastructure assets	SWOT (WO), Value Chain (Support)
SI10	School Management Information System	Integration of school data and overall operational processes	Value Chain (Support)
SI11	Academic Information System (SIAKAD)	Academic data management and educational planning	CSF
SI12	Strategic School Development Information System	Strategic decision-making and school program development	SWOT (ST)
SI13	Student Admission Information System (PPDB)	End-to-end management of new student admissions	Value Chain (Primary)

SI14	Procurement Information System (SIPlah)	Management of procurement for educational resources and facilities	Value Chain (Primary)
SI15	Classroom Information System	Support for classroom learning activities	Value Chain (Primary)
SI16	Online Report Card Information System	Management and presentation of student academic reports	Value Chain (Primary)
SI17	Alumni Information System	Alumni data management and tracking	Value Chain (Primary)
SI18	Student Guidance Information System	Spiritual guidance and character development support	Value Chain (Primary)
SI19	Financial Information System	Comprehensive financial management	Value Chain (Support)

3.2.2 Application Portfolio

Based on the IS strategy mapping in the previous stage, it is identified that SMP Islam Darussalam requires various information systems and technologies to support its academic and operational activities. The large number of proposed systems indicates the need for proper planning in system development and implementation. By developing an application portfolio, the organization is able to determine the priority of system development based on its strategic impact and operational importance. This portfolio helps the organization plan system development in short-term, medium-term, and long-term periods. The application portfolio is developed using the McFarlan Strategic Grid, which classifies applications into four categories: Strategic, High Potential, Key Operational, and Support. The complete application portfolio mapping is presented in Figure 6.

Strategic	High Potential
SI01 – E-Learning Information System SI06 – Online Examination Information System	SI05 – Quality Assurance Information System SI07 – IS/IT Monitoring Information System SI12 – Strategic Program Development Information System SI17 – Alumni Information System
Key Operational	**Support**
SI11 – Academic Information System (SIAKAD) SI13 – Student Admission Information System (PPDB) SI16 – Online Report Card Information System SI19 – Financial Information System SI03 – Teacher and Staff Information System	SI02 – Extracurricular Information System SI04 – School Website / CRM System SI08 – Human Resource Management Information System SI09 – Facilities and Infrastructure Information System SI10 – School Management Information System SI14 – Procurement Information System (SIPlah) SI15 – Classroom Information System SI18 – Student Guidance Information System

Figure 6. Application Portfolio of SMP Islam Darussalam

Based on the portfolio mapping results, systems that fall into the Strategic category are considered as top priorities due to their significant impact on achieving organizational goals. In this study, the E-Learning Information System (SI01) and the Online Examination Information System (SI06) are identified as strategic applications, as both systems play a crucial role in supporting digital learning processes and form the core components of the Learning Management System (LMS).

4. Discussion

The results indicate that IS/IT strategy development at SMP Islam Darussalam is driven by organizational needs identified through internal and external analyses. The use of CSF, SWOT, and Value Chain highlights critical needs in improving education quality, integrating technology into learning, and enhancing student services, which is consistent with previous studies on IS/IT strategic planning in educational institutions [15][34] The organization shows strong commitment to technology adoption; however, challenges such as limited system integration, suboptimal system utilization, and infrastructure constraints remain. These issues emphasize the need for a structured IS/IT strategy aligned with organizational goals[10][11].

The classification of strategies into IS business, IS/IT management, and IT strategy provides a comprehensive approach to addressing these challenges. The IS business strategy supports core educational processes, while IS/IT management ensures governance and sustainability. The IT strategy provides infrastructure to enable integration and optimal performance. Additionally, the identification of 19 proposed systems reflects a clear translation of business needs into relevant technological solutions. The McFarlan Strategic Grid analysis shows a shift toward a more integrated digital learning environment, supporting previous findings that digital learning systems improve educational effectiveness and accessibility [2][5][26]. The positioning of the E-Learning and Online Examination systems in the Strategic quadrant highlights their importance for both current operations and future development. Prioritizing these systems within the Learning Management System (LMS)

aligns with broader educational trends and addresses existing limitations in e-learning implementation.

Systems categorized as Key Operational and Support remain important for daily activities, while High Potential systems offer future opportunities. Overall, the Ward and Peppard framework provides a structured approach to aligning IS/IT strategy with business needs, ensuring relevance to current conditions and future challenges, as also identified in previous studies on strategic IS/IT planning implementation[8][23][24][30].

5. Conclusion

Based on the results of this study, the implementation of IS/IT strategic planning using the Ward and Peppard approach at SMP Islam Darussalam provides a clear and structured overview of system requirements and future development directions. Through business, IS/IT, and organizational analyses, this study identifies several issues in the current e-learning implementation, including suboptimal system performance and limited integration, as well as opportunities for more systematic development. The findings indicate that the Ward and Peppard approach is effective in formulating IS/IT strategies aligned with organizational goals and supporting decision-making in system development. The study also produces strategic recommendations in the form of an application portfolio focusing on a Learning Management System (LMS), an online examination system, and a student performance analysis system to support digital learning implementation.

The strength of this study lies in the comprehensive use of the Ward and Peppard framework, which integrates business environment analysis and IS/IT analysis to produce structured strategic recommendations. The use of analytical tools such as SWOT, Value Chain, PEST, Porter's Five Forces, and McFarlan Strategic Grid provides a more systematic understanding of organizational needs and technology development priorities. In addition, this study contributes to the limited discussion of IS/IT strategic planning implementation in Islamic junior high schools, particularly in supporting digital learning and sustainable educational development.

However, this study is limited to a single case study at SMP Islam Darussalam and focuses mainly on strategic planning rather than full system implementation and evaluation. Therefore, future research may explore the implementation and effectiveness of the proposed systems, including user satisfaction, system performance, and the impact of digital learning systems on educational outcomes. Further studies may also involve comparative analysis across different educational institutions to obtain broader insights into IS/IT strategic planning implementation in the education sector.

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