

Smart Santri Management: The Digitalisation of Human Resources in Islamic Boarding Schools for Global Competitiveness

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Abstract

This study aims to analyse the implementation of Smart Santri Management through the digitalisation of human resources (HR) at the Darussalam Blokagung Islamic Boarding School, as well as its impact on the development of globally competitive human capital, particularly in terms of teachers' professionalism and graduates' digital competencies. The research employs a qualitative approach using a case study design. Data were collected through in-depth interviews with 18 informants (leaders, teachers and educational staff), direct observation of the digital system, and a review of documentation. The research findings indicate that the implementation of Smart Santri Management has evolved into a strategy for building global human capital, characterised by: electronic human resource management (E-HRM) for accountability; smart santri learning that integrates Salaf teachings with digital literacy; and data-driven decision-making. These efforts foster a global mindset and enhance graduates' competitiveness through digital portfolios, which balance religious traditions with global technical competencies. The contribution of this research lies in a model for the implementation of HR digitalisation in Islamic boarding schools. The limitations of the research lie in its single-case study scope, meaning the results cannot be generalised to other boarding schools, and the absence of long-term quantitative measurement of improvements in graduates' competitiveness.

Keywords: Digitalisation; Human Resources; Islamic Boarding Schools; Smart Student Management; Global Competitiveness

Abstrak

Penelitian ini bertujuan menganalisis implementasi Smart Santri Management melalui digitalisasi sumber daya manusia (SDM) di Pondok Pesantren Darussalam Blokagung serta dampaknya terhadap pembentukan modal manusia yang berdaya saing global, khususnya dalam profesionalisme guru dan kompetensi digital lulusan. Penelitian menggunakan pendekatan kualitatif dengan jenis studi kasus. Data dikumpulkan melalui wawancara mendalam terhadap 18 informan (pimpinan, guru, dan tenaga kependidikan), observasi langsung pada sistem digital, serta studi dokumentasi. Hasil penelitian menunjukkan bahwa implementasi Smart Santri Management telah bertransformasi menjadi strategi membangun modal manusia global yang

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ditandai oleh: manajemen SDM elektronik (E-HRM) untuk akuntabilitas, pembelajaran santri cerdas yang mengintegrasikan ajaran salaf dengan literasi digital, serta pengambilan keputusan berbasis data. Upaya ini menghasilkan pola pikir global dan proyeksi daya saing lulusan melalui portofolio digital, yang menyeimbangkan tradisi keagamaan dengan kompetensi teknis global. Kontribusi penelitian ini adalah model implementasi digitalisasi SDM di pondok pesantren. Keterbatasan penelitian terletak pada cakupan studi kasus tunggal sehingga hasilnya tidak dapat digeneralisasi ke pesantren lain, serta belum dilakukannya pengukuran jangka panjang terhadap peningkatan daya saing lulusan secara kuantitatif.

Kata kunci : Digitalisasi; Sumber Daya Manusia; Pesantren; Manajemen Siswa Cerdas; Daya Saing Global

I. Introduction

The digitalisation of human resources in Islamic boarding schools has developed in response to the demands of the modern world, which requires speed, precision and efficiency in human resource management (Hamid et al., 2025; Murdianto, 2021). Islamic boarding schools have begun to implement Smart Student Management as a strategy to modernise administration, guidance, and the monitoring of students' progress (Lutfiyah et al., 2025; Lundeto et al., 2021). This shift is evident in the use of student management applications, digital learning platforms, and data-driven activity documentation systems, which make the entire process more transparent and measurable. These developments indicate that Islamic boarding schools are shifting from traditional models to modern management systems capable of producing a generation of students with skills relevant to global needs.

Strengthening students' digital skills is a vital requirement for the development of human resources capable of competing at a global level. Islamic boarding schools are now integrating technological skills into their student development programmes, as the world of work and higher education demand digital skills as a basic standard (Badrun, 2024; Faizin, 2024; Musyaffa et al., 2023). This is evident in the emergence of training programmes in coding, graphic design, digital content production and data literacy, delivered either progressively or intensively. Through these various training programmes, students are becoming increasingly prepared to face the challenges of the modern era and are equipped with the ability to bridge the values of the Islamic boarding school with the professional demands of the modern world.

Changes in organisational culture within Islamic boarding schools are beginning to be seen as a consequence of the digitalisation of human resource management systems. Activities that previously relied on verbal communication and manual record-keeping are now shifting towards more structured systems utilising digital technology. The use of electronic attendance systems, online financial reports and automated activity documentation demonstrates increased accountability and professionalism in governance. This shift in work culture signifies that Islamic boarding schools are not only

places for shaping religious character, but also institutions that foster a modern organisational culture relevant to the needs of developing human resources capable of competing globally (Muhith et al., 2023; Ihsan et al., 2021; Musaddad, 2021).

Collaboration between Islamic boarding schools and the business world is growing stronger in line with the need to accelerate the transfer of technology and knowledge to students (Faizin, 2024; Parhan et al., 2024). Various partnerships with technology companies, professional training institutions and digital start-ups provide students with opportunities to take industry-led courses, participate in digital work-placement programmes and obtain skills certifications. These collaborations open up opportunities for students to familiarise themselves with the dynamics of the modern workplace and to expand their skills in areas previously under-represented in the traditional curriculum (Mahmudi & Aimah, 2025; Thornhill-Miller et al., 2023). The existence of these partnerships demonstrates that Islamic boarding schools are actively adapting to global needs through strategic external relationships.

The digitalisation of pesantren human resources has resulted in a technology-based human resources ecosystem that enables more accurate mapping of students' potential and competencies (Stuart, 2024). Systems such as competency dashboards, digital portfolios and an integrated alumni database help Islamic boarding schools monitor students' progress and draw up more targeted development plans. This well-organised data also enhances the quality of assessment and provides students with the opportunity to showcase their achievements in a digital format that can be accessed at any time. The existence of this ecosystem demonstrates that Islamic boarding schools are capable of blending traditional wisdom with modern technology to produce a generation of students who are religious, adaptable and globally competitive.

Previous research specifically examined how the implementation of Human Capital Management (HCM) software at a modern Islamic boarding school in West Java was able to map students' talents, thereby facilitating the planning of their careers in the global arena (Utama et al., 2025). These findings are consistent with a study which found that digital literacy training for teachers and students not only improves efficiency but also fosters an innovative and competitive mindset (Suryanti & Ikawati, 2025). On the other hand, the 'digital culture' readiness of boarding school staff is a key determining factor, which is often more important than the sophistication of the technology itself (Luthra et al., 2025). Meanwhile, the integration model demonstrates how the Kurasi e-learning platform can accommodate both religious knowledge and 21st-century skills simultaneously (Purbasari et al., 2025). Collectively, the findings of this study suggest that the digitalisation of human resources in Islamic boarding schools constitutes a strategic ecosystem that focuses not only on technocratic aspects but also on strengthening the

culture and values of Islamic boarding schools to produce high-calibre and contextually relevant human resources.

The novelty of this research lies in the development of the Smart Santri Management model, which integrates digital technology, pesantren human resource management, and the cultural character of the pesantren as an ecosystem for developing globally competitive human resources. Unlike the study by Utama et al. (2025), which focused solely on talent mapping via HCM software, this study presents a more comprehensive framework by linking digital mapping to the santri's career development pathways on a global scale. This study also expands upon existing findings by introducing the concept of fostering sustainable digital work behaviour, rather than merely enhancing innovative mindsets (Suryanti & Ikawati, 2025). Furthermore, this study addresses criticisms by developing a digital culture readiness index specific to Islamic boarding schools (Luthra et al., 2025), and goes beyond existing models by designing the Smart Santri Dashboard, which integrates religious knowledge, global literacy and a record of students' competencies. . Consequently, this study aims to bridge this gap by developing an approach that simultaneously integrates digital technology, human resource management and the values of Islamic boarding schools—an approach that remains under-explored in existing research on the digitalisation of human resources in Islamic boarding schools.

The urgency of this study lies in the pressing need for Islamic boarding schools to respond to changes in an increasingly digital and competitive world. Various previous studies have shown that digitalisation in Islamic boarding schools is still only partially underway, such as talent mapping, digital literacy training, cultural readiness, and the integration of e-learning. This situation indicates that there is no comprehensive model capable of combining technology, human resource management, and the values of Islamic boarding schools within a single, well-directed system. Consequently, this research is of great significance as it offers a holistic approach through 'Smart Santri Management', which not only strengthens technological capabilities but also regulates digital work behaviour, assesses cultural readiness, and maps out comprehensive career development pathways for santri. With increasingly fierce global competition, Islamic boarding schools require a modern and sustainable human resource development system to produce human resources that are competitive, adaptable, and retain the distinctive characteristics of Islamic boarding schools. The aim of this study is to analyse the implementation of Smart Santri Management through the digitalisation of human resources, as well as its impact on the development of globally competitive human capital, particularly in enhancing teachers' professionalism and graduates' digital skills.

II. Research Method

The selection of the Darussalam Blokagung Islamic Boarding School in Banyuwangi as the research site was based on its status as one of the major Islamic boarding schools in Banyuwangi, East Java, Indonesia, which has successfully integrated traditional education systems with digital innovation (Aimah et al., 2024). This Islamic boarding school has a complex educational ecosystem encompassing formal, non-formal and higher education, making it an ideal case study for examining the implementation of Smart Santri Management. Furthermore, Darussalam has developed various digital programmes, such as an integrated information system, online da'wah media, and digital literacy training for students, which align with the research focus on the digitalisation of pesantren human resources. The openness of the supervisors and management towards technological transformation also makes this pesantren a concrete model for the development of human resources based on spirituality and global competitiveness, which is relevant to the research objectives.

A qualitative approach using a case study design was chosen for this research as it enables an in-depth exploration of the processes, meanings and dynamics involved in the implementation of Smart Santri Management within Islamic boarding schools (Cole, 2024; Mtisi, 2022). This approach enables the researcher to gain a contextual understanding of how the digitalisation of human resources is applied to develop globally competitive human resources, without neglecting the distinctive spiritual values of Islamic boarding schools. Through the case study, the researcher can explore the real-life experiences of religious leaders, carers and students in undertaking digital transformation, including the challenges, adaptation strategies and resulting impacts. This method was chosen because Islamic boarding schools possess unique characteristics that cannot be measured by quantitative data alone, but must be understood through the interpretation of meaning, social interactions, and daily practices that shape the integration of technology and spirituality.

The use of primary and secondary data sources in this study aims to provide a comprehensive and in-depth overview of the implementation of Smart Santri Management in the digitalisation of human resources at Islamic boarding schools (Ajayi, 2023). Primary data was utilised as it provides factual information directly from the field through in-depth interviews, participatory observation, and documentation of human resource management activities at the Darussalam Blokagung Islamic Boarding School in Banyuwangi. Key informants in this study included boarding school supervisors and educational institution leaders with authority over digitalisation policies. Meanwhile, supporting informants comprised ustaz, administrative staff and active santri directly involved in the implementation of the digital system. Furthermore, secondary data was obtained from the pesantren's documents, activity reports, digital archives and academic

literature relating to human resource management in pesantren and the digitalisation of education to strengthen the analysis and validate the research findings.

Table 1. Informants

No	Informant	Gender		Code/Quantity
		Man	Woman	
1	The Head of the Islamic Boarding School	1		Pim./1
2	Heads of educational institutions	2		Pena./2
3	Ustadz	3	3	Ust./6
4	Students	3	3	SE / 6
5	Administrative Staff	3		SA/3
	Total	12	6	18

In-depth interviews, participant observation and documentary analysis were employed in this study to obtain rich, authentic and contextual data. In-depth interviews were conducted to explore the perceptions, experiences and strategies of carers, institutional managers and students in implementing the digitalisation of human resources. Participant observation was used to enable the researcher to gain a direct understanding of the dynamics of digital activities and behaviours within the pesantren environment, including the interaction between spiritual values and technology. Meanwhile, a documentary review was carried out to explore archives, activity reports, digital policies and other supporting data that corroborate the field findings. The combination of these three techniques enables the researcher to gain a comprehensive understanding of the processes, values and actual practices of 'Smart Santri Management' in a holistic manner.

The Miles and Huberman interactive model was used as the data analysis technique in this study as it provides an in-depth and systematic understanding of complex qualitative data (Salmona & Kaczynski, 2024). This model emphasises three main stages—namely, data reduction, data presentation, and conclusion/verification—which are carried out iteratively and are interrelated. This approach is consistent with the nature of the 'Smart Santri Management' research, which draws on a variety of sources of information, ranging from interviews and observations to documentation. Through this interactive model, researchers can identify patterns, meanings and relationships between variables in a contextual manner, producing accurate and reflective analyses, as well as depicting the reality of human resource digitalisation in Islamic boarding schools as a whole.

Triangulation of sources, methods and observers was employed in this study to ensure the validity and reliability of the data obtained from various perspectives. Source triangulation was carried out by comparing information from pesantren carers, institutional managers, ustaz and santri, ensuring that the data collected was neither

subjective nor one-sided. Methodological triangulation was applied through the use of in-depth interviews, participant observation and documentary analysis to reinforce the consistency of findings across data collection techniques. Meanwhile, observer triangulation was carried out by involving more than one researcher, namely the supervising lecturer as a second researcher who independently checked the validity of the data, reviewed the interview transcripts, and provided corrections to the lead researcher's initial interpretations. Although the second researcher was not physically present in the field at the same time, the peer review process and intensive discussions during data analysis served to minimise subjective bias. The use of these three forms of triangulation is essential to ensure that the Smart Santri Management study produces data that is credible, accurate and truly reflective of the reality of human resource digitalisation in Islamic boarding schools.

III. Result and Discussion

A. Implementation of E-HRM (Electronic Human Resource Management)

The implementation of E-HRM at the Darussalam Blokagung Islamic Boarding School focuses on enhancing the accountability and professionalism of core human resources (teachers and ustadz), as demonstrated through the use of a digital attendance system (such as fingerprint scanning or a mobile app) that is directly integrated with the calculation of salaries and allowances, ensuring consistency in the implementation of working hours and attendance in accordance with the school's standard operating procedures (SOPs). Furthermore, teachers' performance data (such as assessment results from pupil surveys and the completion of administrative tasks) is managed digitally in a centralised database, which serves as a factual basis for promotions, job rotations and the identification of specific training needs, thereby making the HR management process more meritocratic and transparent. This is as stated by Ustadz Masyrofi, a member of the Quality Control Team.

Since 2023, teacher and staff attendance has no longer been recorded manually. We now use a mobile app with geo-tagging features, as well as fingerprint scanners at the entrance. This attendance data is directly linked to the finance department, so it can be used as the basis for calculating salaries and incentives. This system also helps to reduce fraud and subjective assessments.

Ustadz Anas Saeroji, Deputy Head of the Education and Teaching Division, also spoke about the database of teaching and non-teaching staff, which corroborates the information above.

"We have a centralised database containing all data on teachers, ranging from their certification history and training to their performance evaluation results. Through this system, management can easily filter data based on teachers' competencies and track records

when carrying out rotations or promotions, thereby making the process more objective.”

This information indicates that the Darussalam Blokagung Islamic Boarding School has successfully transitioned its traditional human resources (HR) administration functions into a professional, merit-based E-HRM framework. The use of a digital attendance system (geo-tagging and fingerprint recognition), which is directly integrated with the payroll system, serves not merely as a tool for recording attendance, but as a key driver for upholding accountability and work discipline in line with modern educational standards, thereby eliminating subjective bias. Furthermore, centrally stored data on teachers’ performance, training history and teaching satisfaction surveys completed by students helps management to manage talent more effectively. Through this data, management can identify high-performing teachers, carry out staff rotations and determine the training that is genuinely required. Consequently, human resource development becomes more targeted, measurable and effective. For further clarification, please refer to the following diagram.

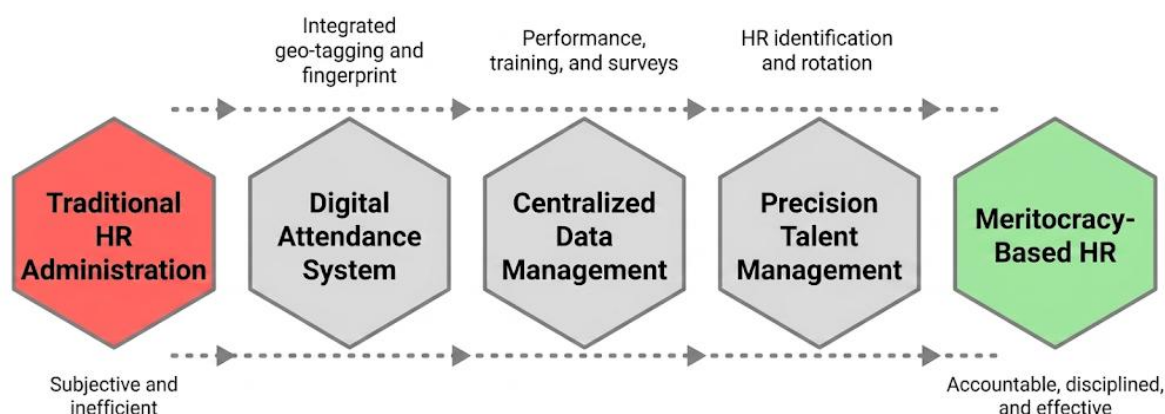


Figure 1. The Transformation of Human Resources in Islamic Boarding Schools through E-HRM

The figure illustrates the transformative journey of human resources in Islamic boarding schools from a traditional, subjective and inefficient model to a modern, merit-based system (Sahrodi & Karim, 2025; Faizin, 2024). This process began with the adoption of a Digital Attendance System utilising integrated geolocation and fingerprint technology, which forms the basis for the collection of accurate attendance data (Rana & Kaur, 2023; Talukdar & Ganguly, 2021). This data is then consolidated within Centralised Data Management, including performance results, training and survey findings, thereby enabling Islamic boarding schools to implement effective Talent Management through the identification and rotation of human resources based on competence. The culmination of this transformation is the creation of a meritocratic workforce that is accountable, disciplined and effective, demonstrating that E-HRM not only automates but

fundamentally transforms the way Islamic boarding schools manage and develop their human resources to achieve higher standards of professionalism (Zolak Poljašević et al., 2025; Guerci et al., 2022).

B. Digitalisation in Teaching (Smart Santri Learning)

The digitisation of teaching at the Darussalam Blokagung Islamic Boarding School is achieved through the use of blended learning, which combines conventional Salafiyah methods with modern technology, whereby teachers use projectors or interactive whiteboards to present material from e-books or digital journals. In formal education institutions (such as vocational schools, senior secondary schools and Islamic senior secondary schools), e-learning platforms are used for submitting assignments, online assessment and providing supplementary materials, thereby familiarising students with a digital-based academic environment. This initiative aims to equip students with adequate digital literacy whilst maintaining a strong foundation in religious principles, preparing them to face the challenges of Society 5.0. This was explained by Budi Santoso, a senior student at the school.

"As well as studying religion, we have specialised subjects or extracurricular activities focusing on IT and design. Our teachers also often ask us to look up references in the digital library and submit assignments via email or Google Classroom. This makes us feel that studying religion and technology go hand in hand, rather than being separate."

The statements made by these students provide strong evidence of the success of the Darussalam Blokagung Islamic Boarding School in integrating religious values with the demands of the Society 5.0 era. The inclusion of specialised IT and design subjects, as well as extracurricular activities, demonstrates the boarding school's commitment to producing human resources who are proficient in both religious knowledge and technology. The use of digital media such as digital libraries, email and Google Classroom in the assignment submission process not only improves administrative efficiency but also directly develops students' digital literacy and online collaboration skills, making these essential competencies. Most importantly, the assertion that religious education and technology are "aligned, not separate" confirms that Islamic boarding schools have successfully fostered an adaptive mindset in students—namely, the ability to view technology as a tool to support knowledge and professionalism, rather than as a threat—which is the key to future global competitiveness. For further details, see the table below.

Table 2. Table on the Implementation and Impact of the Digitalisation of Human Resources

Domain	Key Elements	Factual Evidence	Impact
E-HRM (Electronic Human Resource Management)	Human Resources Performance Management & Accountability	The use of a fingerprint/geo-tagging attendance system integrated with payroll. Performance data (surveys and student reports) is managed centrally untuk meritokrasi, promosi dan rotasi guru/ustadz.	Enhancing the professionalism and discipline of human resources, which are fundamental requirements untuk tenaga kerja berstandar global.
Smart Santri Learning	Curriculum & Teaching Integration	Implementation of blended learning (traditional textbooks + e-journals/projectors). Use of e-learning platforms (Google Classroom/internal LMS) for assignments, online assessment and the provision of supplementary materials.	Training in digital literacy and technology adaptation skills for pupils, to equip them with the competencies required for Society 5.0.
Data-Driven Decision-Making	Strategic Decision-Making	The implementation of the SIS (Student Information System) is integrated with financial and disciplinary data. The use of data dashboards to analyse the appropriate human resources training needs and an early warning system for students experiencing difficulties.	Management decisions are objective and on target, reflecting modern and efficient corporate governance.
Global Development of Mindset and Competitiveness	Competency Assessment & Graduate Branding	Foreign language training programmes (Arabic/English) supported by digital learning applications; the use of CBT (Computer-Based Testing) for examinations; and the development of digital portfolios for students to record their achievements and certifications.	To produce graduates who possess a competitive edge (digital and language skills) and demonstrable performance evidence to compete in higher education or the global labour market.

Source: Research findings

The table shows that the Darussalam Blokagung Islamic Boarding School has adopted a structured Smart Santri Management framework, which goes beyond the mere digitisation of basic administrative tasks. The implementation of E-HRM through a geotagging attendance system and data-driven performance management has effectively enhanced the accountability and professionalism of teaching staff (Aloqaily et al., 2024; Kambur & Yildirim, 2022), which forms the basis of a strong human resources system. Regarding the teaching dimension (Smart Santri Learning), the combination of blended learning with the use of an e-learning platform effectively fosters digital literacy and 21st-

century skills among students (Budiarto et al., 2024). Furthermore, the use of data-driven decision-making and the development of a global mindset through CBT and digital portfolios demonstrate the strategic orientation of Islamic boarding schools (Elihami et al., 2024; Alali, 2022) in producing graduates who are not only spiritually outstanding but also possess measurable competitiveness on the global stage. In conclusion, digitalisation in these Islamic boarding schools serves as a strategic instrument for developing human resources and producing graduates who are adaptable to the demands of Society 5.0.

C. Digitalisation for Data-Driven Decision-Making

The Darussalam Blokagung Islamic Boarding School uses an integrated information system (via the Darussalam Santri Information System (SIS), which can be downloaded from the Play Store) to collect operational data, ranging from tuition fee payment histories—which generate real-time financial reports—to records of student discipline and academic performance. This data is processed into a management dashboard that enables leaders and supervisors to make targeted strategic decisions, such as identifying students who may be at risk of academic or financial difficulties (an early warning system), determining the allocation of staff training budgets based on measurable needs analysis, and reviewing the effectiveness of teaching programmes. This system ensures that decisions are based not only on intuition, but also on valid facts and figures. The following is a statement from Kiai Ahmad Munib Syafa'at, Head of Finance at the Islamic Boarding School.

"In the past, if we wanted to know about a student's financial situation or academic progress, we had to wait for time-consuming manual reports. Now, through the integrated dashboard, we can quickly view real-time financial reports on tuition fees and students' discipline records. This enables us to take immediate action, such as contacting the parents of students who are late with payments or following up with students who frequently break the rules. This is our early warning system."

Information provided directly by the boarding school's leadership highlights the strategic advantages of data-driven decision-making. The transition from slow, manual reporting to an integrated dashboard presenting real-time financial data on tuition fees and academic disciplines has fundamentally transformed the speed and quality of managerial decision-making (Bhosale, 2025; Alali, 2022). This system functions as an Early Warning System and is highly effective, enabling leaders to intervene promptly on critical issues, such as outstanding payments or disciplinary breaches (Bhosale, 2025). The speed with which valid facts and figures (rather than intuition) can be accessed not only enhances the efficiency of governance but also demonstrates the pesantren's commitment to accountability and proactive service (Faizin, 2024; Buanaputra et al.,

2021), which is a hallmark of Smart Santri Management that is adaptable to modern management standards.

D. Globally-Oriented Human Resource Development (Global Mindset)

Efforts to develop globally-oriented human capital at the Blokagung Islamic Boarding School are achieved by incorporating competencies relevant to international competitiveness into the curriculum and human resource management. Students are encouraged to master Arabic and English through digital learning applications, as well as to undertake Industry 4.0-based vocational skills training (such as basic coding or digital marketing), enabling them to win national competitions. Meanwhile, teachers and ustadz are actively involved in online webinars and international seminars to absorb best practices in pedagogy and global educational governance. Consequently, graduates of the Islamic boarding school are projected not only to be competent graduates, but also professionals with a global outlook who are ready to compete in the international labour market. This explanation was provided by Ustadz Dimas, Head of the Board of Trustees of the Islamic Boarding School, as follows:

“We recognise that the key to global competitiveness is language. Therefore, our Arabic and English language proficiency programmes are supported by access to premium digital learning apps. Students are required to use these outside of class hours. The aim is clear: to ensure that our graduates are not only able to read classical Islamic texts, but can also communicate and engage in discussions in international forums.”

This explanation demonstrates that the Darussalam Blokagung Islamic Boarding School strategically views proficiency in foreign languages as a fundamental key to developing globally competitive human resources, beyond traditional religious competencies. By requiring students to access premium digital learning applications for Arabic and English outside of class hours, the boarding school is effectively utilising technology to accelerate language proficiency (Le et al., 2025; Alieto et al., 2024). This initiative reflects a shift in focus from merely the ability to read ancient texts to the ability to communicate and participate actively in international forums (Mehrpouyan, 2023; Kew & Tasir, 2022). This reaffirms that the boarding school’s objective is to produce graduates who possess sound intellectual capital and interactive skills to compete globally, whilst maintaining their Islamic identity.

E. Projected Graduate Competitiveness (Global Competitiveness)

Digitalisation is used strategically to measure and project the competitiveness of graduates from the Darussalam Blokagung Islamic Boarding School. Assessment methods have been enhanced through the use of Computer-Based Tests (CBT) for formal examinations, familiarising students with globally standardised examination formats (such as university entrance exams). Furthermore, the pesantren has developed a Digital

Portfolio system for students, which records and documents all achievements, projects and digital certifications obtained by students throughout their education. This portfolio serves as tangible evidence of graduates' competencies and marketability, as assessed by higher education institutions and prospective employers, affirming the boarding school's output as human capital possessing a competitive edge at both national and global levels. This is as explained by Ustadz Komarudin as follows:

"We have fully transitioned to CBT (Computer-Based Testing) for promotion exams and final exams. The aim is not only to improve the efficiency of marking, but also to train the students to become accustomed to a globally standardised testing environment, such as the UTBK or overseas scholarship entrance exams. Their mental and technical preparedness is far better."

This information indicates that the transition from traditional examination models to CBT (Computer-Based Testing) at the Darussalam Blokagung Islamic Boarding School is a strategic move, not merely an improvement in administrative efficiency. This decision demonstrates a strong focus on enhancing the competitiveness of graduates on the global stage. By familiarising students with the digital testing environment from an early stage, Islamic boarding schools proactively develop their mental and technical readiness to meet the international assessment standards applied in higher education (such as the UTBK or overseas scholarship tests) (Maulidati & Abbott, 2024; Juhaidi et al., 2023). The implementation of CBT underscores that Islamic boarding schools are investing in a learning process that prepares human capital to meet global academic expectations (Faizin, 2024); Anggadwita et al., 2021), ensuring that their spiritual and academic competencies can be assessed and demonstrated through widely recognised formats (Li et al., 2024; Fopka-Kowalczyk et al., 2023). For further details, see the following figure:

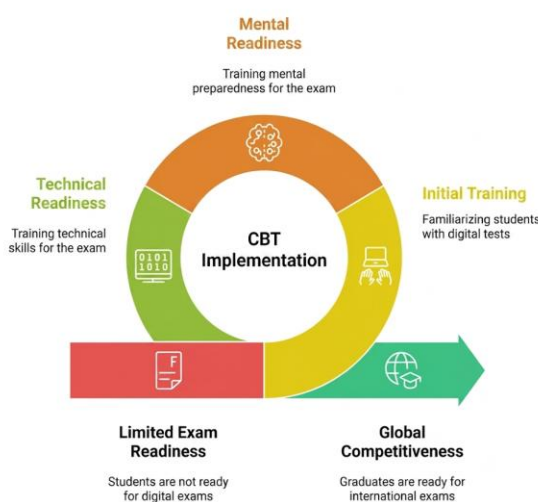


Figure 2. Enhancing Graduates' Competitiveness Through CBT

The figure illustrates that the implementation of CBT is a strategic step in addressing students' limitations regarding digital examinations, steering them towards global competitiveness (Faloye & Taiwo, 2025; Mohamed Hashim et al., 2022). The process begins with an Initial Training programme to familiarise students with digital testing, which simultaneously builds Mental Readiness (overcoming exam anxiety) and Technical Readiness (proficiency in operating the system) (Deng & Liu, 2025; Hawes & Arya, 2023). This cycle of continuous improvement ensures that students at Islamic boarding schools are prepared to tackle internationally standardised examination formats, such as university entrance exams or global scholarship assessments (Juhaidi, 2024; Efendy et al., 2023). Thus, CBT serves as a vital tool that holistically prepares graduates to compete effectively in technology-based academic and professional arenas.

IV. Conclusion

The implementation of Smart Santri Management at the Darussalam Blokagung Islamic Boarding School has evolved from the digitisation of administrative processes into a comprehensive strategy for developing globally competitive human capital, characterised by the use of E-HRM to ensure the accountability of teaching staff through attendance- and data-based evaluations, as well as the strengthening of Smart Santri Learning, which integrates Salaf teachings with digital literacy and modern vocational skills. Furthermore, digitalisation has facilitated data-driven decision-making by leaders, enabling informed decisions based on analyses of student performance and teachers' training needs, rather than relying solely on intuition. All these efforts culminate in the development of a global mindset and the enhancement of graduates' competitiveness through proficiency in foreign languages supported by technology and the creation of measurable digital portfolios. Thus, the Darussalam Blokagung Islamic Boarding School has succeeded in balancing religious traditions with the demands of professionalism and global adaptation, producing graduates who are not only spiritually outstanding but also technically competent in the digital age.

The main limitation of this study is its methodological scope, which is largely descriptive and qualitative in nature, with the case study confined to the implementation at the Darussalam Blokagung Islamic Boarding School; consequently, it is difficult to generalise the findings to other Islamic boarding schools with different characteristics and scales. Furthermore, a limitation may lie in the accuracy of measuring the long-term outcomes of globally competitive human capital, as the impact of digitalisation on graduates' careers requires longitudinal analysis. Therefore, further research is strongly recommended to conduct a comparative quantitative study involving several Islamic boarding schools that have implemented E-HRM or SIS, to test the significance of the relationship between the level of digitalisation in human resource management and the measured levels of teacher professionalism and graduate competitiveness, as well as to

conduct periodic alumni surveys to measure the ROI (Return on Investment) of digital-based human resource development..

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