Main Issues of Pedagogy and Psychology
e-ISSN 1829-1295 (Online)
miopap.com/en

Volume 4 · Issue 2 · 2026
Pages 1475–1483

The Zinki.ai Platform: Its Role and Significance in Supporting Manuscripts and the Islamic Sciences

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Received: 23/05/2026 | **Accepted:** 22/09/2026 | **Published:** 17/10/2026

ABSTRACT

Throughout their long history, the Islamic sciences have placed exceptional emphasis on the documentation of knowledge and the preservation of its sources. Arabic manuscripts have constituted the principal repositories through which the intellectual achievements and scholarly thought of successive generations have been transmitted across the centuries. As scholarly activity increasingly moves into contemporary digital environments, artificial intelligence technologies—particularly handwritten text recognition (HTR) and optical character recognition (OCR)—have emerged as key means of revisiting this vast intellectual heritage, facilitating access to its contents, and transforming manuscripts from static images into dynamic digital texts that can be searched, edited, and collated.

Nevertheless, the application of these technologies to manuscripts relating to the Islamic sciences involves more than a purely technical undertaking. It must take into account the distinctive characteristics of this heritage and the textual sensitivity of its contents, which require a high degree of precision in reproducing wording, identifying Qur'anic verses and Prophetic hadiths, and verifying quotations and personal names. Accordingly, this study undertakes a systematic and critical examination of specialised digital platforms, particularly Zinki.ai, to explore their potential contribution to research in Islamic jurisprudence, Qur'anic exegesis, and hadith studies. It also seeks to identify the epistemological and methodological safeguards necessary to ensure that scholarly and editorial judgement remains firmly in the hands of the researcher, thereby avoiding uncritical reliance on automated outputs in the absence of verification and documentation.

INTRODUCTION

The use of artificial intelligence technologies in processing heritage documents has become one of the contemporary approaches capable of contributing to the preservation of knowledge, improving access to it, and facilitating its scholarly utilisation. The significance of this application is particularly pronounced in the field of the Islamic sciences, since a substantial proportion of their scholarly sources remains preserved in Arabic manuscripts that vary in image clarity, script styles, the physical condition of their folios, and the arrangement of their texts and marginalia. The challenges involved are not confined to the recognition of individual letters; they also extend to the accurate reproduction of Qur'anic verses and hadiths, the identification of quotations, the recognition of personal and scholarly names and book titles, and the understanding of the contexts in which particular expressions occur.

In this context, the Zinki.ai platform emerges as a tool for the automated recognition of Arabic texts, including handwritten manuscript materials, and for converting images into digital texts that can be edited and searched. The platform's official project page presents an example of its use in the scholarly editing of a well-known traditional exegetical gloss entitled Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd. According to that page, the tool assisted the editorial

team in reading and transcribing the text, as well as in preparing it for scholarly editing, while enabling the comparison of manuscript copies and the identification of textual variants among them.[1]

Examining this experience requires more than merely describing the platform's advertised technical functions. It also entails identifying what these functions can offer researchers in the Islamic sciences, while distinguishing between the potential benefits afforded by the tool's capabilities, the outcomes documented in the published case study, and claims that still require independent testing. Accordingly, this section approaches the Zinki platform from an applied and critical perspective, examining its contribution to manuscript studies and Islamic scholarship, as well as the limits of reliance on its outputs.

Research Problem

The present study addresses the following central question: How can the Zinki platform be employed in support of manuscript studies and the Islamic sciences? What forms of scholarly benefit does it offer, and what safeguards are necessary to ensure that the outputs of automated transcription do not become an unverified substitute for the original heritage text?

This central question gives rise to several operational questions: What functions does the platform demonstrate in the published case study? How can it assist in digitising manuscript texts, searching their contents, and collating different manuscript witnesses? What is its significance for researchers in Qur'anic exegesis, hadith, Islamic jurisprudence, the principles of Islamic jurisprudence, and the Arabic language? What are the limitations of the published accuracy rates? And what procedures should be followed before citing an extracted text or adopting it in scholarly editing?

We shall seek to address these questions in the sections that follow, asking God for guidance and success.

1. THE ZINKI PLATFORM AND THE CASE STUDY UNDER EXAMINATION

1.1. Defining the Platform's Function in the Field of Manuscripts

In the sources examined in this study, the Zinki platform is presented as a tool for the automated recognition of Arabic handwriting and the conversion of photographed or scanned documents into machine-transcribed texts that can be edited and searched. The significance of this function lies in the transition from treating a manuscript page as a static image to engaging with its contents as a digital text whose words can be searched, specific passages retrieved, and content reorganised, including for the preparation of preliminary indexes. Ben Sassi has also highlighted the potential use of this conversion process for indexing and searching textual content, in the context of his discussion of the application of artificial intelligence to hadith studies.[2]

A distinction must be drawn here between digitising an image of a manuscript and converting its contents into a digital text. A digital image preserves the visual appearance of the page and allows researchers to consult the original image, whereas a text generated through automated recognition enables research and editorial functions that are not as readily available through the image alone. Nevertheless, the extracted text remains an automated representation of the image and may be affected by image quality, script type, overlapping letters, line distribution, and the presence of marginalia and other markings. The fact that a text can be edited or searched therefore does not necessarily mean that it accurately reproduces the original, nor does it mean that it has become a critically edited text.

From a methodological perspective, the most appropriate role of such a platform is to provide a preliminary digital draft that facilitates the work of the researcher and textual editor, rather than to deliver a definitive judgement as to the correct reading. Automated recognition processes an image according to the system's technical capabilities, whereas the critical editing of a text requires linguistic and contextual knowledge, an understanding of the history of the manuscript witnesses, the collation of textual evidence, and the documentation of variant readings. Maintaining this distinction between the technical function and scholarly judgement is an essential condition for benefiting from artificial intelligence without compromising the integrity of textual transmission.

1.2. The Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd Project: An Applied Case Study

The official project page states that the Zinki platform was used to assist the manuscript-editing team affiliated with the Centre for Maliki Manuscripts and Islamic Studies in Tunisia in processing an exegetical work known under the

titles Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd and Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd ʿalā Irshād Shaykh al-Islām Abī al-Suʿūd. The page describes the work as extensive in size and notes the diversity of scripts found in its manuscript witnesses. It also provides an example involving the Tunisian Husayni script. According to the same source, the platform assisted in reading and transcribing the text, preparing it for scholarly editing, and facilitating the collation of manuscript copies and the identification of differences among them.[3]

The significance of this case study derives from the nature of the material being processed. An exegetical gloss may contain Qur'anic passages, Prophetic hadiths, statements by Qur'anic commentators, linguistic citations, quotations from other works, as well as scholarly comments and objections. In such a context, an error involving a single letter or word may have consequences extending beyond an inaccurate reading: it may affect the attribution of a statement to its author, the interpretation of an argument, or the identification of the source from which a quotation was taken. Accordingly, the use of automated recognition in exegetical manuscripts must be accompanied by specialised scholarly review.[4]

Nevertheless, the published information does not provide a comprehensive and detailed account of all the stages involved in implementing the project. It does not specify the number of pages processed, the number of manuscript copies entered into the system, the extent of subsequent human correction, or the time required for each stage. It is therefore reasonable to state that the official source reports the use of the platform for reading, transcription, textual preparation, and collation; however, this description alone does not justify quantitative estimates of the amount of work completed or the time saved.

A bibliographical examination also reveals discrepancies in certain bibliographical details concerning the title of the work, the name of its author, and the author's date of death in the Gregorian calendar, as presented on the project page and in the al-Raq al-Manshur catalogue. These discrepancies are not, in themselves, sufficient to establish the definitive form of the relevant information; rather, they necessitate consultation of biographical sources and manuscript records. This observation confirms that digital tools, however useful they may be in extracting text, do not automatically resolve questions of attribution, title, or dating. Such matters require independent bibliographical verification.[5]

2. THE ROLE OF THE ZINKI PLATFORM IN SUPPORTING THE ISLAMIC SCIENCES

2.1. Converting Manuscripts into Searchable and Editable Digital Texts

The principal benefit of automated manuscript recognition lies in producing a digital text that can be treated as research material, rather than merely as an image to be read visually. Once the contents of a page have been converted into searchable text, it becomes theoretically possible to locate a particular word or technical term, retrieve all the passages in which it occurs, trace the recurrence of an expression, search for a reference or personal name, and compile preliminary lists of sources and topics. These functions can assist researchers in organising their material before proceeding to detailed analysis.

The importance of this capability becomes particularly evident in the case of extensive manuscripts or works comprising multiple volumes, since manually locating a particular word across numerous pages may require considerable time and effort. A digital text can shorten the preliminary search process, provided that the extraction is sufficiently accurate and that the researcher checks the search results against the original images. If a word is omitted from the extracted text or incorrectly recognised, it may not appear in the search results. Digital searching should therefore not be regarded as a complete substitute for visual examination, particularly when conducting an exhaustive survey intended to cover all relevant occurrences.

In the Islamic sciences, this functionality may prove useful for tracing technical terms in the principles of Islamic jurisprudence, collecting passages in which a Qur'anic verse or hadith is used as evidence, identifying a jurist's references to works within a particular legal school, or preparing preliminary indexes of scholars and books. These are examples of potential research applications made possible by digital texts in general; they should not be understood as claims that all such functions have actually been tested in the Maṭāliʿ al-Suʿūd project. Their practical value remains dependent on the quality of the extracted text and the extent to which its correspondence with the original image is documented.

2.2. Supporting the Critical Editing of Manuscripts and the Collation of Copies

The platform's official project page indicates that it can collate manuscript copies and highlight the differences among them. This functionality may be valuable in scholarly editing projects that rely on more than one manuscript witness, as digital comparison can help identify passages in which the texts differ, organise these locations, and draw the editor's attention to places requiring further examination. In this way, the tool may assist in structuring the editorial process and reduce the need to rely exclusively on sequential visual comparison at every point.[6]

However, identifying a difference is not equivalent to determining its textual significance. A discrepancy between two digital texts may arise from the automated misrecognition of a letter, the omission of a word, the merging of two words, or differences in line arrangement or the representation of marginalia. Not every discrepancy identified through automated comparison may therefore be incorporated into the apparatus of variants before consulting the manuscript images, since a difference may be technical rather than an authentic feature of the manuscript. Moreover, preferring one reading over another requires consideration of the relationships among the manuscript witnesses, their dates, the context, textual evidence, and the adopted editorial methodology.

Accordingly, the safest role for the platform in collation is to assist in detecting and organising potential points of divergence. Verifying whether a discrepancy is genuine, evaluating its significance, and determining which reading should be preferred remain the responsibility of the textual editor. This requires preserving the raw extracted text of each manuscript copy, linking every variant passage to the image from which it was derived, and documenting any human intervention that may affect the meaning.[7]

2.3. Supporting Qur'anic Exegesis, Hadith, Islamic Jurisprudence, Its Principles, and Related Disciplines

The significance of the Zinki platform for the Islamic sciences is closely connected to the nature of the sources used in these disciplines and the ways in which they intersect. An exegetical manuscript may contain Qur'anic verses, hadiths, statements by the Companions, Successors, and Qur'anic commentators, as well as linguistic, rhetorical, and jurisprudential discussions. Hadith works may include commentaries, annotations, and references to transmission routes, while works of Islamic jurisprudence and its principles may contain quotations from different legal schools, terminological discussions, the use of textual evidence in legal reasoning, and debates concerning opposing scholarly positions. Digital texts can facilitate searching across these components and assist in preparing their indexes, provided that they undergo appropriate review.[8]

In Qur'anic exegesis, searchable texts may help gather the passages in which an author discusses a particular verse or exegetical term, or trace references to works of Qur'anic interpretation and linguistics. In hadith studies, they may facilitate the retrieval of passages mentioning a particular hadith, narrator, or book, while making it essential to verify the wording and attribution and to distinguish the hadith text from the commentator's own remarks. In Islamic jurisprudence and its principles, they may support the collection of legal questions in which a particular technical term occurs, the identification of passages quoting and using scholarly opinions as evidence, or the preparation of preliminary subject indexes. In the Arabic linguistic sciences, they may facilitate the tracing of linguistic and grammatical citations on which an author relies when interpreting texts.

It must be emphasised that these applications represent potential capabilities that may be developed through the conversion of manuscripts into digital texts. They do not mean that the platform independently issues legal rulings, verifies the authenticity of hadiths, or determines which jurisprudential opinions should be preferred. Such tasks are scholarly in nature and require methodological tools, specialised knowledge, and independent verification sources. Distinguishing between assistance in locating a text and the assessment of its meaning or authenticity preserves the researcher's role and prevents the attribution to the system of scholarly authority beyond the function established by the available sources.

2.4. Contributing to Cataloguing, Heritage Accessibility, and the Development of Digital Resources

One potential outcome of converting manuscripts into searchable texts is the ability to prepare preliminary lexical and subject indexes, develop textual corpora for academic research, and facilitate the retrieval of information from lengthy works. Digital texts may also help organise references to Qur'anic verses, hadiths, scholars, and books, provided that such references are reviewed and verified before being adopted. The literature consulted in this study has highlighted

the potential use of automated conversion for indexing and searching within textual content.[9]

The importance of this capability increases when heritage materials are distributed across numerous volumes or multiple manuscript copies, or when the aim is to make texts accessible to researchers who need to locate specific passages without having to browse through images page by page. Digital accessibility, however, does not necessarily mean that a text is ready for publication or citation. The platform or project should indicate the level of review to which the text has been subjected and distinguish clearly between the original image, the automated output, the corrected text, and the critically edited text.

Furthermore, preserving the images, raw and corrected texts, and a record of modifications makes it possible to review the work at a later stage and reduces the risk of losing the decisions made by the editor during the review process. Such practices may contribute to a more transparent research environment in which results can be independently re-examined, provided that the rights of libraries and custodial institutions, as well as the conditions governing access to and republication of manuscript images, are respected.[10]

3. ASSESSING REPORTED PERFORMANCE AND THE LIMITS OF RELIANCE ON AUTOMATED OUTPUTS

3.1. A Critical Examination of the Published Accuracy Rates

A review of the published sources reveals two reported accuracy rates relating to automated recognition in an example involving the Tunisian Husayni script. The Zinki platform’s official project page reports an accuracy rate of 94% for character recognition and 88% for word recognition. By contrast, a news report published by Al-Araby Al-Jadeed on 31 December 2022 cites a rate of 94% for characters and 76% for words. Thus, the two sets of figures coincide at the character level but differ at the word level.[11]

These data alone are insufficient to establish whether the platform’s performance improved or deteriorated, since the published material does not provide enough detail to determine whether the two rates were obtained using the same sample and an identical evaluation protocol. A reliable comparison would require information about the sample size, the method used to select the pages, the reference text against which the outputs were compared, the treatment of diacritics and punctuation, word segmentation procedures, the system version, and the conditions under which it was operated. Each figure should therefore be attributed to its respective source and should not be presented as an independent finding of the present study.

It is also necessary to distinguish between character recognition accuracy and word recognition accuracy, as these are two different measures. A single character error may cause an entire word to be classified as incorrect in word-level evaluation, even when most of its characters have been recognised correctly. Similarly, the omission of a word or the merging of two words may affect the evaluation in a way that is not reflected in the same manner by the character-level metric. A high character recognition rate does not, therefore, mean that the text is equally accurate in terms of meaning or suitable for adoption in scholarly editing.

The published figures are therefore useful for describing what the developer has announced or what the news report has conveyed, but they cannot replace independent testing. Such testing requires the preparation of a verified reference text, the definition of a sample of known size, the standardisation of the comparison procedure, and the calculation of both character error rate and word error rate, accompanied by qualitative examples of the errors identified. The reference study on the evaluation of historical handwriting recognition systems emphasises the importance of documenting the dataset, as well as the normalisation and comparison procedures; its findings, however, should not be transferred directly to Arabic manuscripts without appropriate qualification.[12]

3.2. The Textual Sensitivity of Islamic Manuscripts and the Need for Specialist Review

Islamic scholarly manuscripts differ from many general texts in that certain errors may have scholarly consequences extending beyond a mere disruption of the wording. In the case of Qur’anic verses, it is necessary to distinguish between what the scribe actually recorded in the manuscript and the established Qur’anic text. Any apparent variation in the manuscript should be documented, and silent correction that erases features of the witness should be avoided. With regard to hadiths, one must distinguish between reading the wording as it appears in the manuscript and verifying its attribution to a source or assessing its authenticity. The names of scholars, book titles, and jurisprudential

and legal-theoretical terms likewise require careful review, since a difference of a single letter or word may lead to ambiguity in attribution or meaning.[13]

This does not mean that the Zinki platform has necessarily made specific errors in these instances; the available sources do not provide complete outputs that would allow such a conclusion to be independently established. Rather, the point is that the nature of Islamic scholarly texts requires these elements to be prioritised during the review of any automated recognition system. The greater the significance of a passage for legal reasoning, source attribution, or the attribution of an opinion, the greater the need to verify it against the original image and consult the relevant scholarly sources.[14]

It is also important to distinguish among three stages of textual work: the raw text produced by the system; the text reviewed by the researcher, in which extraction errors have been corrected; and the critically edited text adopted after collating the witnesses and documenting readings and editorial choices. Keeping these three stages distinct makes it possible to identify the source of each modification and enables reviewers to retrace the process that led to the final reading. By contrast, directly replacing the raw text with the corrected version without preserving the former makes it more difficult to assess the errors and determine the impact of human intervention.

3.3. Principal Limitations on the Use of the Platform

The principal methodological limitations that should be taken into consideration can be summarised as follows:

- The quality of the output is affected by the characteristics of the image, the script, and the page layout; a uniform level of performance should not be assumed across all manuscripts.
- The digital text may omit or misrecognise certain words, potentially affecting search and indexing results if the outputs are not reviewed.
- Identifying differences between texts does not establish that every detected difference is an authentic variation between manuscript witnesses; it may instead result from automated recognition or formatting.
- Reported accuracy rates cannot be generalised to all script types or every field of the Islamic sciences without appropriate testing.
- Converting an image into text does not resolve questions concerning a book’s attribution to its author, the date of its transcription, or the accuracy of references to other sources.
- The extracted text should not be used for scholarly quotation or critical editing before it has been checked against the original image, particularly in textually sensitive passages relating to the Islamic sciences.

These limitations do not diminish the value of the platform; rather, they define the domain in which it can be useful and clarify the conditions under which it should be employed. The tool becomes more beneficial when integrated into a clearly defined workflow in which its raw outputs are preserved, errors are reviewed, corrections are documented, and final decisions remain the responsibility of the researcher or qualified textual editor.

4. A PROPOSED PROCEDURAL FRAMEWORK FOR EMPLOYING ZINKI IN THE SERVICE OF ISLAMIC MANUSCRIPTS

On the basis of the platform’s stated functions and the limitations of the published data, a practical workflow comprising seven stages may be proposed for its use in scholarly editing projects and research in the Islamic sciences. This workflow is a methodological proposal; it is not intended as a definitive description of all the procedures implemented in the Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd project.

Stage	Proposed procedure	Scholarly and supervisory objective
1. Image documentation	Describe the manuscript, volume, folio, and recto or verso; record image clarity and distortion; and preserve an unaltered original copy.	Ensure that the original can be consulted and that the conditions of image processing are understood.
2. Text extraction	Run the platform and preserve the raw text exactly as generated, while recording the date of use, system version, and available settings.	Prevent confusion between the automated output and the text subsequently corrected by the researcher.
3. Page structure review	Examine the arrangement of lines and paragraphs, and distinguish the main text from marginalia, headings, and other markings.	Reduce layout-related errors before reviewing individual words.
4. Specialist review	Compare the extracted words against the image, giving priority to Qur’anic verses, hadiths, personal names, quotations, and technical terminology.	Ensure careful verification of passages with particular scholarly and semantic significance.

5. Manuscript collation	Check differences identified through digital comparison against images of the manuscript witnesses, and classify them as genuine variants, automated errors, or formatting differences.	Prevent technical discrepancies from being incorporated into the textual apparatus as authentic variants.
6. Final verification	Review source attributions, verify names and book titles, document textual decisions that affect meaning, and distinguish accurate transcription from the authenticity or validity of the cited material.	Ensure the accuracy of the transcribed text, source attribution, and scholarly assessment of quotations.
7. Archiving	Preserve the images, raw text, corrected text, and a record of errors and final decisions.	Enable subsequent review, reassessment, and use in future research.

It is advisable to accompany this workflow with a record of errors and corrections indicating the location of the word or phrase, the system's reading, the reading visible in the image, the adopted correction, the type of error, the source used for verification, and the degree of certainty where doubt remains. It is not necessary to publish all these details in the body of the article; retaining them internally, however, enhances transparency and makes it possible to review the work. If the aim is to measure performance quantitatively, a reference text should be prepared and verified by specialists, after which clearly defined metrics should be calculated on a sample of known size, with both aggregate results and qualitative examples presented.

It is also essential to define responsibilities. The system is responsible only for the functions it performs within its technical capabilities; the textual editor is responsible for the readings adopted; and the researcher is responsible for accurately describing the data, methodology, and limitations. The conditions governing the use of manuscript images and the rights to republish them should also be verified before such images are included in the article or made available as part of a research dataset.

4.1. Findings of the Applied Section

- The published case study indicates that the Zinki platform was used to assist a specialist team in processing an exegetical manuscript. The stated functions include reading and transcribing the text, preparing it for scholarly editing, and enabling the collation of manuscript copies and the identification of differences.[16]
- The principal research benefit of automated recognition lies in preparing an editable and searchable textual draft, which may facilitate preliminary indexing, the retrieval of words and references, and the organisation of comparisons among manuscript witnesses.
- These functions may serve researchers in Qur'anic exegesis, hadith, Islamic jurisprudence, its principles, and Arabic linguistics at the level of accessing and organising texts; they do not replace specialised legal, linguistic, or textual-critical verification.
- Two word-recognition rates appear in the sources: 88% on the official project page and 76% in a news report published in 2022. Both sources report a character-recognition rate of 94%. The available data do not establish that the measurements were based on the same sample or methodology.[17]
- The reported rates alone are insufficient to determine whether the extracted text is suitable for critical editing or scholarly citation, nor can they be generalised to all Arabic manuscripts or every branch of the Islamic sciences.
- The nature of Islamic scholarly texts necessitates particular scrutiny of Qur'anic verses, hadiths, quotations, personal names, and technical terms, while distinguishing the reading of the manuscript from the verification of attribution and the assessment of the material quoted.
- Reliable scholarly use requires preserving the original image, raw text, and corrected text; documenting corrections; verifying differences against manuscript images; and leaving final decisions in the hands of the textual editor.

CONCLUSION

The analysis of the Zinki platform case study demonstrates that artificial intelligence can play a supporting role in the service of Islamic manuscripts, particularly by converting images into searchable and editable digital texts, facilitating the retrieval of recurring passages, and organising preliminary comparisons among manuscript copies. These capabilities are especially significant for exegetical texts and other sources of the Islamic sciences, which contain numerous quotations, references, and technical terms.

The scholarly value of these tools, however, cannot be measured merely by their ability to produce a seemingly readable text or by published accuracy rates for which complete testing details are unavailable. Rather, it depends on

the extent to which outputs can be verified and linked to the original images, the clarity of the review and correction procedures, and the distinction between what the system has generated and what the researcher has decided. The responsible use of the Zinki platform therefore requires treating its output as a preliminary draft rather than a critically edited text, and subjecting sensitive passages to specialist review.

This study recommends expanding independent testing on documented samples of Arabic manuscripts, preparing verified reference texts, recording the script type, image condition, and system version, and calculating error rates while classifying errors according to their type and impact. Such work should also respect the rights of the institutions that preserve the manuscripts. In this way, artificial intelligence can be employed in the service of the Islamic sciences within a framework that combines technical efficiency, scholarly integrity, and researcher responsibility.

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[4] Musa Duraim and Ali Hamidato, “Automated Transcription of Arabic Manuscripts Using Artificial Intelligence,” Al-Sawtiyyat Journal, vol. 22, no. 1 (2026), pp. 273–292, particularly pp. 285–289.

[5] See the official Zinki platform project page; al-Raq al-Manshur, “Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd ʿalā Irshād Shaykh al-Islām Abī al-Suʿūd,” book record; and al-Raq al-Manshur, “Muhammad Zaytuna

al-Munastiri, Abu ʿAbd Allah," author biography.

[6] Zinki.ai, "The Scholarly Editing Project of the Tafsīr Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd," official website. The functions discussed here are understood within the limits of the claims made on the project page and should not be construed as the findings of an independent performance assessment.

[7] See Duraim and Hamidato, "Automated Transcription of Arabic Manuscripts Using Artificial Intelligence," pp. 285–289; and C. A. Romein et al., "Assessing Advanced Handwritten Text Recognition Engines for Digitizing Historical Documents," International Journal of Digital Humanities, vol. 7 (2025), pp. 115–134.

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[9] See Ben Sassi, "Employing Artificial Intelligence in the Service of Hadith Studies," pp. 160–162; and Boumedini, "Applications of Artificial Intelligence in the Processing of Arabic Manuscript Texts," pp. 501–514.

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[13] See Duraim and Hamidato, "Automated Transcription of Arabic Manuscripts Using Artificial Intelligence," pp. 285–289.

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[15] See Duraim and Hamidato, "Automated Transcription of Arabic Manuscripts Using Artificial Intelligence," pp. 285–289; and Romein et al., "Assessing Advanced Handwritten Text Recognition Engines," pp. 115–134.

[16] Zinki.ai, "The Scholarly Editing Project of the Tafsīr Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd," official website.

[17] See Zinki.ai, "The Scholarly Editing Project of the Tafsīr Maṭāliʿ al-Suʿūd wa-Fatḥ al-Wadūd," official website; and "The Zinki Platform: Artificial Intelligence in the Service of Heritage," Al-Araby Al-Jadeed, 31 December 2022. The reported word-recognition rates differ: 88% on the Zinki page and 76% in the news report.