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PRESERVATION AND DIGITAL ARCHIVING OF AZERBAIJANI CARPET HERITAGE THROUGH ELECTRONIC DOCUMENT MANAGEMENT SYSTEMS (IN THE CONTEXT OF LITERARY CARPETS)

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Abstract. This article examines the role of Electronic Document Management Systems (EDMS) in the preservation and transmission of Azerbaijani carpet heritage to future generations. Particular emphasis is placed on “literary carpets,” namely carpets that incorporate elements of folklore, poetry, and symbolic textual motifs, which constitute the primary object of the study. The paper provides a comprehensive analysis of digitization processes, metadata structures, archiving methodologies, and the application of modern technologies. The findings indicate that EDMS play a significant role in both the physical and semantic preservation of carpet heritage. In addition, the study highlights the interactive capabilities of digital platforms. Through such platforms, users not only access information but are also able to conduct comparative analyses of the visual and textual features of carpets. This approach contributes to the wider dissemination of cultural heritage, enhances the effectiveness of scholarly research, and supports the preservation of national identity. Furthermore, cloud technologies and digital security mechanisms are evaluated as key factors ensuring the long-term storage and reliability of archival data.

Key words: Azerbaijani carpet weaving, digital archive, electronic document management systems, literary carpets, cultural heritage.

Introduction. Azerbaijani carpet weaving is considered one of the richest domains of world cultural heritage, encompassing both tangible and intangible elements. Carpets are not merely household items; they also serve as carriers of aesthetic, symbolic, and literary meaning. In particular, certain carpet specimens reflect poetic motifs, epic narratives, and elements of folklore, which allows them to be characterized as “literary carpets” (Azadi, 2018). The imagery depicted on these carpets often conveys specific stories, ideas, or philosophical concepts, thereby functioning as a bridge between visual art and literature. The choice of colors, compositional structure, and the arrangement of symbols serve as important indicators reflecting the aesthetic taste and cultural worldview of a given historical period.

At the same time, the structural diversity of carpet ornaments and their symmetrical composition demonstrate the continuity of national artistic traditions. Each motif carries not only an aesthetic function but also a specific semantic content, often linked to elements of collective memory. From this perspective, carpets function as an essential medium for the transmission of cultural codes. In particular, regionally distinctive ornamental styles reflect the local characteristics and richness of Azerbaijani carpet weaving.

In the modern era, the process of global digitalization opens new opportunities for the preservation of national heritage. Through Electronic Document Management Systems (EDMS), it becomes possible to systematically register, classify, and preserve carpet specimens. This approach ensures not only physical preservation but also the structured organization of information (Conway, 2010). Furthermore, digital databases enable the comparative analysis of carpet samples from different

regions, contributing significantly to the advancement of scholarly research and the international recognition of cultural heritage.

The application of digital technologies also facilitates the presentation of carpet heritage in new formats. Through virtual exhibitions, interactive platforms, and digital catalogs, users can engage more closely with these artistic artifacts. This not only ensures the preservation of carpet heritage but also promotes its wider dissemination and accessibility to broader audiences.

Literature Review. The issue of Azerbaijani carpet weaving and its preservation as a component of cultural heritage has been extensively examined by various scholars. Traditional approaches have primarily emphasized the semantic content of carpet ornaments, their regional characteristics, and stages of historical development. For instance, Kerimov (2013) systematically analyzed the typological features of Azerbaijani carpets and the origins of their ornaments, highlighting their close connection with cultural identity. Similarly, Azadi (2018) explained the symbolic and aesthetic functions of carpet motifs, noting that they carry both artistic and ideological meanings. These studies demonstrate that carpet ornaments are not merely decorative elements but also serve as expressions of social memory and collective identity.

In recent years, however, scholarly attention has increasingly shifted toward the application of digital technologies. Digital archiving and Electronic Document Management Systems (EDMS) are regarded as essential tools for the preservation of cultural heritage. Conway (2010) emphasizes that digitization is not only a means of data storage but also a strategic approach to ensuring long-term preservation. Hughes (2019) expands the concept of digital heritage by underscoring the importance of metadata and data standardization within this process. In addition, several studies highlight the impact of digital platforms on user experience and the possibilities of data visualization, which facilitate broader access to cultural heritage for diverse audiences.

Research conducted within the context of literary carpets remains relatively limited; however, existing studies indicate that carpets function not only as decorative artifacts but also as carriers of text and symbolic meaning. In his study on the management of digital collections, Sayre (2016) stresses the importance of multi-layered description for such objects. Furthermore, some contemporary approaches, particularly within the framework of semantic analysis and digital humanities, consider it possible to interpret carpet ornaments as textual entities. Overall, the existing body of literature suggests that the preservation of carpet heritage in the digital environment requires the integration of traditional approaches with modern technologies, offering broad prospects for future research in this field.

Discussion. The findings of the present study demonstrate that Electronic Document Management Systems (EDMS) serve as an essential and effective tool for the preservation and systematic management of Azerbaijani carpet heritage. In particular, for objects with multilayered semantic structures, such as literary carpets, digital archiving enables not only the preservation of their physical attributes but also their symbolic and semantic dimensions. This approach not only ensures the long-term safeguarding of cultural heritage but also creates extensive opportunities for its in-depth investigation across various scientific disciplines (Conway, 2010).

The semantic load of ornaments and motifs in literary carpets constitutes one of the central directions of research in this field. These carpets frequently incorporate elements that reference classical Azerbaijani poetry, epic narratives, and folklore traditions. For example, carpets inspired by the “Leyli and Majnun” motif symbolically express universal themes such as love and devotion. In this respect, they function not merely as decorative art objects but also as visual interpretations of literary texts (Kerimov & Rustamov, 2013). Such characteristics distinguish literary carpets from other types and make their study more complex and multidimensional.

The informative value of literary carpets lies in their role not only as aesthetic objects but also as carriers of historical and social information. The imagery depicted on these carpets reflects the social

relations, ideological perspectives, and cultural values of a particular period. From this perspective, their preservation in the digital environment can be understood not only as the safeguarding of artistic artifacts but also as the preservation of collective memory (Azadi, 2018).

Electronic Document Management Systems act as the primary technological platform in this process. EDMS are software systems designed for the collection, storage, and management of various types of data. Their main functions include data structuring, enrichment through metadata, provision of search and filtering capabilities, as well as the implementation of long-term storage and security mechanisms (Sayre, 2016). These features enable the systematic management and effective utilization of information in the field of carpet studies.

The implementation of EDMS in the carpet domain facilitates the creation of comprehensive and multi-layered databases for each carpet specimen. Such databases include detailed information such as the carpet's name, origin, weaving techniques, materials used, color palette, and the semantic interpretation of motifs. This, in turn, allows researchers to conduct comparative analyses based on various parameters and contributes to the generation of more profound scientific insights.

The process of digital archiving constitutes a core component of these systems and involves several stages. At the initial stage, high-quality digital images and 3D models of carpet specimens are created, ensuring the accurate recording of their visual characteristics. The subsequent stage involves the creation of metadata, which enriches each object with descriptive information. Metadata plays a crucial role in the identification, classification, and retrieval of objects within digital systems (Hughes, 2019).

During the classification stage, carpets are grouped according to criteria such as theme, region, technique, and stylistic features. This facilitates the systematic organization of data and enables more efficient analysis. At the final stage, the data are archived for long-term storage through servers and cloud technologies. This approach not only ensures data security but also guarantees accessibility at any time.

For literary carpets, an additional stage of semantic analysis is incorporated into this process. At this stage, the meanings of the symbols depicted on the carpets, their connections with literary sources, and their historical context are examined. This allows for not only visual but also text-based analysis of carpets, ensuring a more comprehensive understanding of their characteristics.

Semantic Interpretation and Visualization in the Digital Environment

The development of digital technologies is not limited to data storage; it also enables deeper levels of interpretation and visualization. These capabilities are particularly significant for objects with complex semantic structures, such as literary carpets. In this context, the way literary motifs are visually represented on carpets is illustrated in Figure 1.

Through digital visualization technologies, the structural composition of carpet ornaments can be presented with greater clarity. A detailed view of carpet patterns and their compositional features is illustrated in Figure 2. Such visual representations enable researchers to analyze the structure of ornaments in a more in-depth and comprehensive manner.

The development of digital technologies is not limited to data storage; it also enables deeper levels of interpretation and visualization. These capabilities are particularly significant for objects with complex semantic structures, such as literary carpets. In this regard, the ornaments and symbols depicted on carpets can be analyzed through various analytical tools available on digital platforms. This expands the possibilities of traditional research methods and facilitates the generation of new scientific insights.

Through digital visualization technologies, the structural composition of carpet ornaments can be presented with greater clarity. For example, high-resolution images and 3D models allow users to examine the detailed elements of carpets. This approach is especially valuable for achieving a more precise understanding of the narratives and motifs represented in literary carpets. In addition, digital platforms offer features such as interactive maps and timeline functions, which make it possible to trace the historical development and geographical distribution of carpets (Hughes, 2019).



Figure 1. Visual representation and symbolic expression of literary motifs (e.g., “Leyli and Majnun”) in Azerbaijani carpet weaving



Figure 2. Structural composition of Azerbaijani carpet ornaments and a close-up view of pattern elements

The application of semantic analysis methods plays a crucial role in uncovering the layers of meaning embedded within carpets. In this process, the relationships between the symbols depicted on carpets and their corresponding literary sources are identified, enabling contextual interpretation. For instance, certain ornaments can be analyzed in relation to metaphors found in classical poetry. This makes it possible to study carpets not only as decorative objects but also as “visual texts.” Such an approach is closely linked to the development of digital humanities and contributes to the emergence of new research directions in this field (Azadi, 2018).

On the other hand, the integration of data within the digital environment is of significant importance. Through Electronic Document Management Systems (EDMS), data obtained from various sources can be consolidated into a unified platform. This enables the analysis of carpet specimens

within a broader context. For instance, information about a particular carpet can be systematized based on its connections with literary sources, historical events, or specific geographical regions. Such integration enhances the complexity of research and contributes to the objectivity of the results (Conway, 2010).

The user-oriented design of digital platforms also plays a crucial role in this process. Through interactive interfaces, users can access and analyze information more efficiently. This increases the accessibility of carpet heritage not only for researchers but also for the general public. Thus, the digital environment functions not only as a database but also as an educational and awareness-raising platform.

At the same time, the application of artificial intelligence technologies opens new perspectives in this field. Through machine learning algorithms, the automatic recognition and classification of carpet ornaments become possible. This enables faster processing and analysis of large volumes of data. Such technologies may, in the future, contribute to a more systematic study and preservation of carpet heritage (Sayre, 2016).

The long-term preservation of data stored in digital environments also requires particular attention. For this purpose, it is essential to implement measures such as data backup, encryption, and security protocols. These measures prevent data loss and ensure the reliability of information. Especially for cultural heritage objects, such security practices are of strategic importance. The integration of digital technologies and EDMS creates new opportunities for the preservation and study of Azerbaijani carpet heritage. The presentation of the semantic and visual features of literary carpets within the digital environment facilitates their dissemination to a wider audience and their inclusion in academic discourse. This can be regarded as an important step toward the preservation and development of national cultural heritage. The application of Electronic Document Management Systems (EDMS) plays a crucial role in preventing the loss of cultural heritage. Considering the risk of physical carriers deteriorating or being destroyed over time, digital archiving emerges as an effective strategy for minimizing such risks. Since data stored in digital environments are protected through multiple backup systems, the likelihood of data loss is significantly reduced (Conway, 2010).

On the other hand, EDMS considerably enhance accessibility for researchers. Through digital platforms, scholars operating in different countries can access the same databases, which promotes the expansion of international scientific collaboration and the emergence of new research directions. As a result of applying multidisciplinary approaches, carpet heritage is studied within a broader context, strengthening integration across various scientific fields.

In the field of education, the implementation of EDMS improves the quality of the learning process. Digital platforms provide students with the opportunity to study carpet specimens interactively, thereby facilitating the integration of theoretical knowledge with practical application and enhancing overall learning effectiveness. The inclusion of literary carpets in the educational process supports the integration of disciplines such as literature, history, and art, and contributes to the development of students' comprehensive and critical thinking skills.

In the tourism sector, the application of digital archiving also creates new opportunities. Through virtual exhibitions and online catalogs, tourists can gain extensive knowledge about Azerbaijani carpet weaving. This contributes to the enhancement of the country's cultural tourism potential and its promotion at the international level. In particular, the presentation of literary carpets generates both aesthetic and intellectual interest among visitors.

At the same time, the implementation of EDMS is accompanied by certain challenges. The development of technical infrastructure, the execution of high-quality digitization processes, and the shortage of qualified specialists are among the primary issues in this field. In addition, the standardization of data and their alignment with international standards require additional resources and coordinated efforts.

The security of digital data and the protection of intellectual property rights constitute critical concerns in this field. When disseminating digital reproductions of carpet specimens, it is essential to define and safeguard their legal status. In this regard, the development and implementation of appropriate legal mechanisms are of paramount importance.

From a methodological perspective, the application of EDMS requires specific approaches. The accurate description of carpet specimens, their semantic interpretation, and contextual analysis represent key components of this process. This approach is particularly significant for literary carpets, as their layers of meaning can only be fully revealed through not only visual analysis but also consideration of literary and cultural contexts (Hughes, 2019).

In this respect, multidisciplinary collaboration is of special importance. The joint efforts of historians, philologists, art historians, and information technology specialists enable a more comprehensive and objective study of carpet heritage. Such an approach also facilitates the development of new research methodologies and the expansion of existing knowledge.

Electronic Document Management Systems open significant perspectives for the preservation and development of Azerbaijani carpet heritage. In particular, the presentation of literary carpets within the digital environment reveals new possibilities for interpretation and enhances the overall quality of research conducted in this field. In the future, the integration of these systems with artificial intelligence and other innovative technologies will enable the automatic recognition and analysis of carpet ornaments, thereby contributing to the achievement of new scientific advancements (Sayre, 2016).

The further advancement of Electronic Document Management Systems (EDMS) extends beyond the mere storage and structuring of existing data and directly influences the process of knowledge production. In this context, databases developed on digital platforms evolve from passive archival repositories into active research environments. Within such environments, users not only access information but also reinterpret it, conduct comparative analyses, and generate new findings. This approach is particularly valuable for objects with multilayered semantic structures, such as literary carpets, as it enables their examination across multiple levels of interpretation.

At the same time, methodologies emerging within the framework of digital humanities provide new perspectives for the study of carpet heritage. Through approaches such as text analysis, visual analytics, and network-based data analysis, the relationships between carpet ornaments and literary sources can be identified in a more systematic manner. This transforms research from a purely descriptive endeavor into an analytical one. As a result, carpet specimens are evaluated not only as cultural artifacts but also as complex carriers of information.

The standardization of data in the digital environment is another crucial aspect. Presenting data obtained from diverse sources in a unified format facilitates their integration and comparative analysis. For this purpose, the application of international metadata standards is essential. The standardization process requires not only technical alignment but also methodological consistency, enabling the comparability of research outcomes across different countries and strengthening global scientific collaboration.

Another important dimension is the optimization of user experience. Digital platforms with intuitive and functional interfaces ensure the efficient use of data. Interactive tools, filtering mechanisms, and visual presentation formats facilitate user interaction with information. This enhances the effectiveness of the learning process for both researchers and students. Particularly in visually oriented fields, such approaches accelerate knowledge acquisition and comprehension.

Furthermore, the continuous updating of data within the digital environment is a critical requirement. Since carpet heritage represents a dynamic field, new discoveries, research findings, and interpretations must be regularly incorporated into the system. This ensures the relevance of the database and enhances its scientific value. A dynamic data environment encourages researchers to adopt more flexible thinking and apply innovative approaches.

Digital transformation is not merely a technological shift but also a change in cultural perspective. This process not only preserves traditional knowledge but also enables its reinterpretation within new contexts. Consequently, through the application of Electronic Document Management Systems, Azerbaijani carpet heritage can be presented more broadly at both national and global levels and sustainably preserved for future generations.

Conclusion. The overall findings of the conducted research indicate that Electronic Document Management Systems (EDMS) constitute a strategically significant technological tool for the preservation and development of Azerbaijani carpet heritage. In particular, the storage of artworks with complex semantic and aesthetic structures, such as literary carpets, within digital environments ensures the transmission of both their physical and intangible values to future generations. In this regard, EDMS function not only as archiving tools but also as effective platforms for the systematization and reproduction of knowledge.

Within the framework of the study, it has been established that the process of digital archiving provides extensive opportunities for the multidimensional analysis of carpet specimens. In addition to their technical characteristics, the presentation of their semantic content in digital environments enhances the quality of scholarly research in this field. The correlation of motifs depicted in literary carpets with literary sources allows these artifacts to be evaluated not merely as decorative objects but also as products of visual-textual synthesis. This, in turn, stimulates the study of carpet heritage through more complex and multidisciplinary approaches.

At the same time, the application of digital technologies significantly expands the accessibility of carpet heritage. Through electronic platforms, researchers operating in different geographical locations can access the same databases, thereby fostering the development of international scientific collaboration. In this context, EDMS play a crucial role in shaping the global scientific communication environment. Furthermore, the digital environment facilitates the use of carpet heritage for educational and awareness-raising purposes, enabling the implementation of new pedagogical approaches in this field.

However, the research findings also reveal that the implementation of EDMS is accompanied by certain challenges. Insufficient technical infrastructure, a shortage of qualified specialists, and issues related to data standardization are among the main obstacles encountered in this domain. In addition, the security of digital data and the protection of intellectual property rights require particular attention. Addressing these challenges necessitates a comprehensive approach and the development of appropriate legal, technical, and methodological mechanisms.

In conclusion, the role of Electronic Document Management Systems in the preservation and study of Azerbaijani carpet heritage is undeniable. The further development of these systems and their integration with innovative technologies will, in the future, enable new possibilities such as the automatic recognition of carpet ornaments, the deepening of semantic analysis, and the more efficient management of digital heritage. Thus, EDMS emerge as one of the key instruments not only for preserving national cultural heritage but also for integrating it into the global scientific and cultural domain.

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