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Enhancing Object Labeling in Saudi Museums: A Best Practice Handbook with a Focus on the National Museum of Saudi Arabia (NMSA)

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**Enhancing Object Labeling in Saudi Museums: A Best Practice
Handbook with a Focus on the National Museum of Saudi Arabia
(NMSA)**

Master of Arts in Museum Studies, SOAS-Effat University

Dissertation in Museum Studies A24/25 (15PARC993-A24/25)

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Table of Contents

Abstract.....	3
Acknowledgments.....	4
Chapter 1: Introduction.....	5
1.1 Research Purposes and Key Questions.....	6
1.2 Literature Review.....	7
Chapter 2: Methodology.....	9
2.1 Data Collection.....	9
2.2 Research Ethics.....	10
Chapter 3: Findings and Analysis.....	12
3.1 Evaluating Object Labels in the NMSA.....	12
3.2 Evaluating Object Labels in Regional and International Museums.....	15
3.3 Expert Insights on Enhancing Labeling Practices and Standards.....	23
3.4 Survey Insights from Museum Visitors.....	28
Chapter 4: Handbook: Best Practices for Object Labeling in Saudi Museums	30
4.1 Principles of Best Practice in Object Labeling.....	30
4.2 Label Writing and Design Guidelines.....	34
4.3 Accessibility Considerations.....	36
4.4 Digital and Interactive Elements.....	40
4.5 Recommendations for Implementation.....	44
Chapter 5: Conclusion.....	48
List of Illustrations.....	50
List of Tables (Visitor Survey Tables).....	54
Bibliography.....	57

Abstract

This study examines the use of object labels at the National Museum of Saudi Arabia (NMSA) and identifies several issues, including unclear translations, inconsistent bilingual formats, limited accessibility, and the absence of digital tools. This study utilizes expert interviews, visitor surveys, and comparative analysis with other museums, such as the King Abdulaziz Center for World Culture (Ithra) and the Museum of Islamic Art in Doha, to investigate enhancements in labeling practices. The findings demonstrate that numerous labels do not adequately address visitor requirements, especially for individuals who need clear language or supplementary assistance to obtain information. Based on these findings, the study recommends developing a best practice handbook for museums in Saudi Arabia. The handbook can provide guidance on label writing, design, placement, and accessibility, utilizing theories such as the Contextual Model of Learning, Constructivist Learning Theory, and Universal Design (UD). The objective is to help Saudi museums create clearer and more inclusive labels that improve visitor understanding and engagement. The research also suggests that the NMSA could be used as a pilot site to test and refine the handbook, and future studies could explore how these ideas work in other types of museums and cultural settings.

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Chapter 1: Introduction

Object labels play a key role in helping visitors connect with museum collections by guiding how they see, understand, and relate to the objects on display. They are crucial to exhibition design, conveying historical, cultural, and contextual information that improves learning and accessibility for diverse audiences. Contemporary museums prioritize clear language, inclusive communication, and innovative label design to enhance visitor engagement and understanding. Wang and Yoon (2013) emphasize that employing diverse label types, including visual digital augmentations, guiding questions, and instructional prompts, can improve visitor learning. When integrated into exhibitions, they work together to encourage problem-solving, boost critical thinking, and help visitors learn new information by linking it to what they already know.

Museums in Saudi Arabia are undergoing substantial transformation as part of broader cultural initiatives. The National Museum of Saudi Arabia (NMSA) is among the institutions being developed into a leading cultural destination. However, current labeling practices at the NMSA and other major Saudi museums, such as the Dar Al-Madinah Museum, are under critical review. These include inconsistencies in bilingual presentation, limited accessibility features, and a lack of digital integration. These challenges may limit visitor comprehension, undermine inclusivity, and compromise the overall quality of the museum experience.

This study argues that object labels in certain Saudi museums, especially at the NMSA, need significant enhancements to meet international standards. Manfredi

(2021) highlights the significance of professional translation and the use of accessible language to enhance the clarity and inclusivity of bilingual labels for all visitors.

Building on these insights, this study identifies key challenges and visitor preferences through a qualitative analysis of current practices, a visitor survey, expert interviews in the region, and comparative case studies from local and international institutions. It then proposes a practical, evidence-based handbook of best practices. The paper offers strategic guidelines for label writing, design, multilingual integration, and the use of digital tools to improve visitor engagement, learning, and inclusivity in Saudi museums.

1.1 Research Purposes and Key Questions

This study aims to improve object labeling at the NMSA and other Saudi museums by aligning practices with international standards to enhance visitor engagement, understanding, inclusivity, and learning. A key outcome of this research is the development of a practical handbook offering guidelines on best practices in museum labeling. Three key questions guide the research: (1) How effectively do the NMSA object labels engage visitors and convey information? (2) How do case studies and visual examples from Saudi and international museums reveal the strengths and weaknesses of object labeling practices related to visitor engagement, accessibility, and learning experiences? (3) What essential guidelines, practices, and implementation strategies should be included in a handbook to support the NMSA and other Saudi museums in improving written exhibition interpretation?

1.2 Literature Review

Object labels are essential interpretive tools that link visitors to museum collections and communicate cultural and historical information. Scholars emphasize that well-designed labels substantially enhance visitor engagement, understanding, and learning. Reitstätter, Galter, and Bakondi (2022) state that most visitors examine labels with moderate detail. However, frequent visitors engage in a deeper “art-label-art” pattern. Concise and effectively designed labels can enhance visitors' comprehension. According to Bitgood (2000), three key attention-related principles are selectivity, motivated concentration, and limited capacity. As a result, well-organized labels attract more attention when strategically placed and when they incorporate bullet points, bold headings, and visuals.

Beyond visual structure, translation and linguistic accessibility are essential in museums. Manfredi (2021) claims it is important to use professional translators and clear, culturally suitable language to make things easier to read and more open to everyone. Moreover, Khrisna, Dewi, Nababan, and Budiharjo (2023), who examine the accessibility and translation quality of bilingual Indonesian-English labels at the Radya Pustaka Museum in Surakarta, Indonesia, found issues with physical presentation, readability, clarity, grammatical errors, and ambiguous phrasing, highlighting the need for proficient translators and contextual information.

Besides clarity and translation, storytelling serves as an effective method for engaging visitors. Van de Ven and Costello (2024) argue for employing narratives to engage individuals with the histories of objects, especially when provenance is unclear. Van de Ven and Costello (2024) assert that traditional archaeological

collection labels often emphasize a singular phase of an object's life, overlooking its historical contexts and connections. Similarly, Bedford (2001) argues that storytelling promotes reflection, facilitates dialogue, and strengthens emotional connections by helping visitors integrate prior knowledge with new information. Such narratives connect visitors to artifacts across different eras and cultures, offering a distinctive means of education and inspiration.

Digital innovation offers new opportunities for enhancing label interaction. Roberts et al. (2018) demonstrate that interactive touchscreen labels, particularly those designed with questions and timelines, enhance visitor engagement more effectively than traditional labels. McNeil (2023) presents practical solutions exemplified by the Estonian National Museum, which improves multilingual access through the use of e-paper displays and RFID-coded tickets. This approach enables visitors to easily choose their preferred language while also conserving space and energy.

Despite advancements in labeling strategies worldwide, numerous Saudi museums, including the NMSA, continue to face challenges such as inconsistent bilingual presentations, limited accessibility features, and minimal digital integration. On the other hand, institutions like the King Abdulaziz Center for World Culture (Ithra) in Dhahran provide effective examples through bilingual QR-coded labels and mobile guides, though such practices are not widely adopted in the sector. This study emphasizes the need to develop object labels that meet international standards while considering the cultural and linguistic background of Saudi museums' visitors. Accordingly, this study proposes a practical handbook designed to support Saudi museums in enhancing label design and improving visitor interaction through inclusive, multilingual, and digitally integrated strategies.

Chapter 2: Methodology

2.1 Data Collection

This study adopts a qualitative multiple-case comparative approach to examine object labels at the NMSA, alongside selected national and international institutions, including the Science Museum and the British Museum in London, the Etihad Museum in Dubai, the Dar Al-Madinah Museum in Madinah, and the Ithra in Dhahran. The objective was to assess and compare label design, content, and accessibility practices across various contexts.

Direct observation and photographic documentation of object labels were used to gather data. Particular attention was given to aspects such as label design, text size, bilingual presentation, and the use of digital tools like QR codes. Observations were conducted over approximately one year, from the second half of 2024 to the first half of 2025. The collected examples were examined to identify strengths, weaknesses, and opportunities for improvement. The comparative analysis identified multiple deficiencies in labeling practices at the NMSA and other Saudi museums, such as unclear wording, limited use of digital components, discrepancies between Arabic and English content, and inconsistent font sizes.

In addition, written responses were obtained via email interviews with informed consent from Saudi and regional museum professionals, including staff from the Museums Commission and the NMSA. The interviews consisted of five open-ended questions addressing labeling practices, multilingual communication, accessibility

issues, digital integration, and recommendations for improvement. These professional insights complement visitor feedback and observational data by highlighting institutional perspectives, challenges, and opportunities for enhancing labeling standards.

An anonymous visitor survey was conducted over four days in May 2025 to support methodological triangulation, with a primary focus on the NMSA. Few respondents had visited other museums in Saudi Arabia. The survey gathered direct feedback from visitors on label clarity, language use, engagement, and accessibility. This feedback supports findings from observations and expert interviews, contributing to a clearer understanding of current labeling practices.

Finally, academic publications support the results and offer suggestions for enhancing labeling at the NMSA and other Saudi Arabian museums. The findings will aid in the creation of a practical handbook aimed at refining labeling standards and enhancing the visitor experience at the NMSA and other museums in Saudi Arabia.

2.2 Research Ethics

This research was conducted in accordance with SOAS ethical guidelines. Three experts were interviewed as part of the study and provided signed informed consent. One participant, who provided explicit consent to be named, is identified in this research. The other two participants, whose consent forms contained ambiguous

responses regarding the use of their names, are presented anonymously to protect their privacy and ensure ethical compliance.

In addition, an anonymous visitor survey was conducted in accordance with SOAS ethical guidelines. All participants were informed about the purpose of the study at the beginning of the survey, and they were notified in writing that the survey was anonymous, with no personal data collected and responses used solely for academic research. Consent was implied through completion of the survey; after reading the information, participants clicked the button to begin answering the questions.

Chapter 3: Findings and Analysis

3.1 Evaluating Object Labels in the NMSA

Many object labels at the NMSA have issues with design, accessibility, and bilingual text. A significant problem is the difference between Arabic and English labels. Arabic text is often in a larger font than English (Fig. 1). English translations are sometimes too simple or missing important details and context (Figs. 2–3). Some labels are displayed in Arabic only, which limits accessibility for non-Arabic visitors (Fig. 3). Conversely, some labels refer to missing artifacts, such as a mask in the ancient artifacts exhibit (Figs. 5–7). Also, the numbers used on labels are inconsistent—sometimes Arabic numerals are used, and other times Western ones, without a clear pattern (Fig. 3). These inconsistencies make labels harder to understand, especially for international visitors, and reduce the quality of their experience. Moreover, mistakes in translation between Arabic and English are common. For example, “1st century BC–1st century AD” in Arabic is wrongly translated as “1st century BC–2nd century AD” in English (Fig. 8). Addressing these issues is crucial for enhancing museum accessibility, facilitating effective communication, and adhering to international best practices.

In addition to content and translation concerns, the labeling practices at the NMSA are inadequate in terms of material quality and presentation. Labels produced on regular A4 paper can result in limited durability, and their design tends to be visually uniform, constrained to square or triangular formats, with minimal innovation to enhance comprehension or interactivity (Figs. 2-3). Physical damage is common,

characterized by torn labels that may lack critical information (Fig. 4). The NMSA lacks technological integration in its labels, such as QR codes that could provide multilingual access or additional digital content (Figs. 1-8).



Fig. 1, Label for Spice and Aromatic Trade, taken on August 29, 2024, Paper, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].

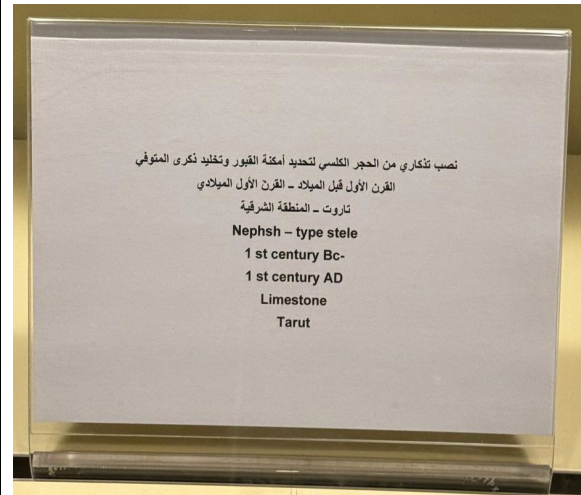


Fig. 2, Nephsh – Type Stele Label, taken on August 29, 2024, Paper, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].

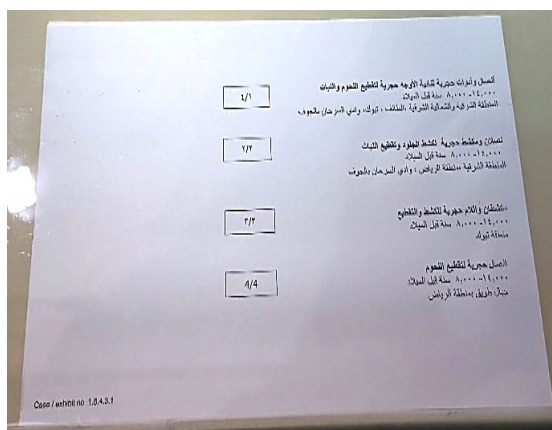


Fig. 3, Arabic-Only Label Without English Translation, taken on August 29, 2024, Paper, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].



Fig. 4, Damaged Label on Prophet’s Mosque Model Exhibit, taken on August 29, 2024, glass case with a descriptive label printed on A4 paper label, Islam and the Arabian Peninsula Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].



Fig. 5, Ancient Artifact Display with Missing Mask, taken on August 29, 2024, Gold and gemstone jewelry display, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].



Fig. 6, Central Mask in Ancient Artifact Display from Virtual Visit, taken on August 29, 2024, Gold and gemstone jewelry display, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].

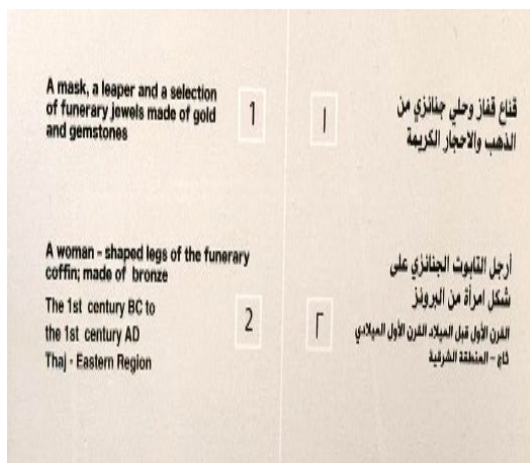


Fig. 7, Label for Missing Mask in Ancient Artifact Display, taken on August 29, 2024, Paper, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].



Fig. 8, Bilingual Label with Inconsistent Historical Periods, taken on August 29, 2024, Paper, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author].

3.2 Evaluating Object Labels in Regional and International Museums

Many Saudi museums, including the Dar Al-Madinah Museum, suffer from design, accessibility, and multilingual language problems with object labels. The differences between Arabic and English content are a major issue. The font size of Arabic writing is frequently greater than that of English (Fig. 9). Moreover, English translations may be too simple or lack essential facts and background (Fig. 9). The Dar Al-Madinah Museum provides some labels exclusively in Arabic, thereby restricting accessibility for non-Arabic-speaking visitors (Fig. 10).



Fig. 9, A Story of "Tobba-King of Himyarite Kingdom" with the People of Medina Labels, taken on April 03, 2025, English paper and Arabic marble labels, Dar Al-Madinah Museum, Madinah, Saudi Arabia. [Photograph by author].



Fig. 10, Arabic-only label for the display of the Prophet's Cave (Ghar Hira) on al-Noor Mountain, taken on April 03, 2025, Marble, Dar Al-Madinah Museum, Madinah, Saudi Arabia. [Photograph by author].

Numerous museums in Saudi Arabia, as well as regional and international institutions, have implemented advanced labeling practices that could enhance standards within the sector. For instance, the Museum of Islamic Art in Qatar and the Islamic Arts Biennale have bilingual labels with balanced font sizes and detailed information (Figs. 11-12). Examples of advanced practice include the Ithra in Dhahran and the House of Islamic Arts (HIA) in Jeddah. They use the same font size for Arabic and English, provide the same information in both languages, and add QR codes for more details (Figs. 13-14). At HIA, QR codes provide access to an audio guide in Arabic, English, and French (Fig. 14). Frameless in London provides an enhanced experience, featuring mobile guides in nine languages and additional functionalities such as audio descriptions (Fig. 15).



Fig. 11, Folio of a Qur'an Manuscript Label, taken on December 03, 2024, Bilingual paper label, Museum of Islamic Art, Doha, Qatar. [Photograph by author].

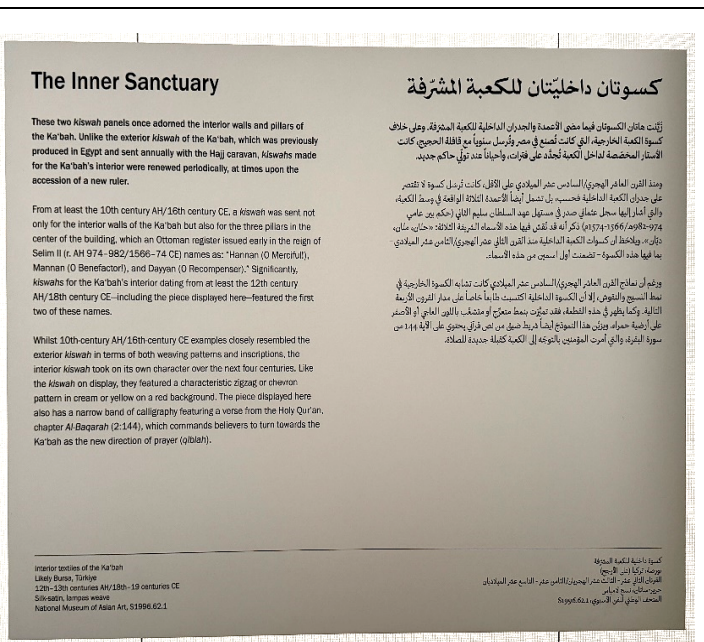


Fig. 12, The Inner Sanctuary Label, taken on April 25, 2025, Bilingual paper label, Islamic Arts Biennale, Jeddah, Saudi Arabia. [Photograph by author].

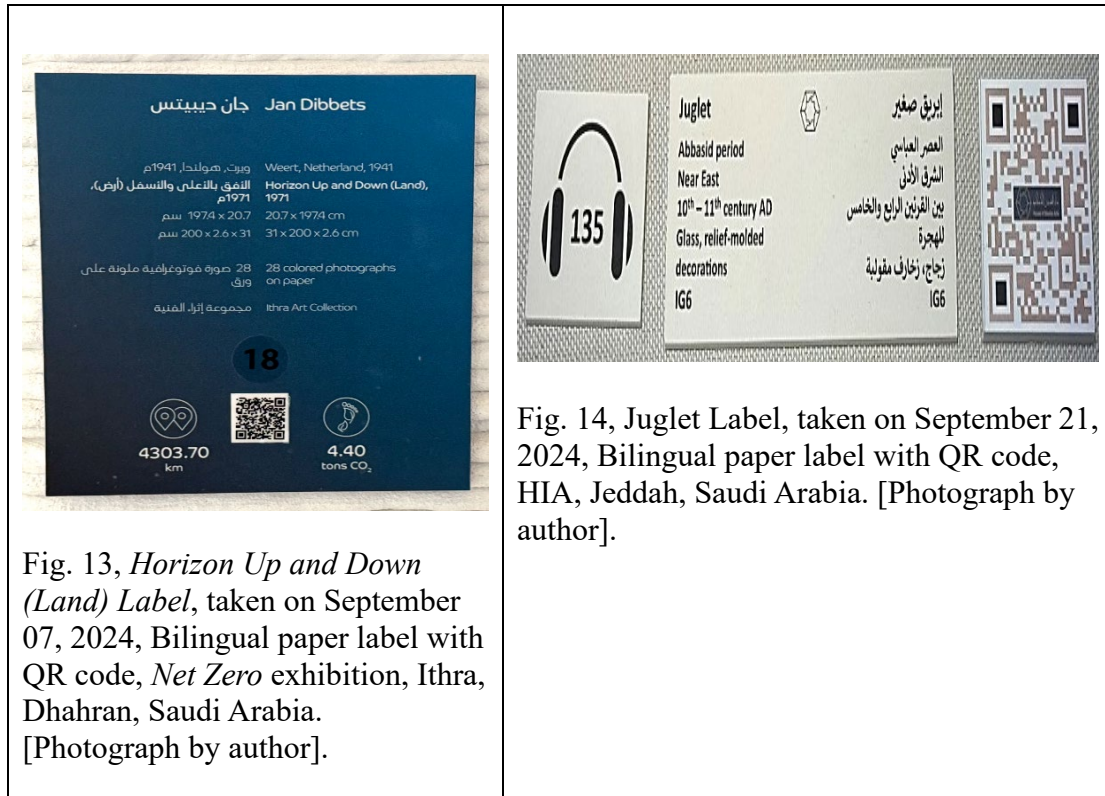


Fig. 13, *Horizon Up and Down (Land) Label*, taken on September 07, 2024, Bilingual paper label with QR code, *Net Zero* exhibition, Ithra, Dhahran, Saudi Arabia. [Photograph by author].

Fig. 14, *Juglet Label*, taken on September 21, 2024, Bilingual paper label with QR code, HIA, Jeddah, Saudi Arabia. [Photograph by author].

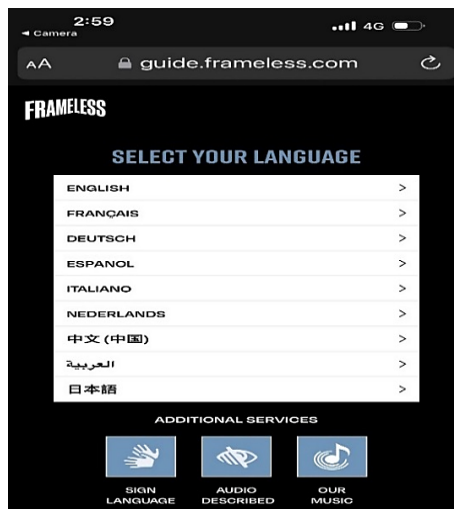


Fig. 15, *Language Selection and Accessibility Options on the Frameless Website* (accessed via QR code), captured on July 19, 2024, website screenshot, Frameless, London, United Kingdom (UK). [<https://guide.frameless.com>], screenshot by author.

Label quality and design in many local and international institutions reflect more advanced practices that could serve as valuable models. In well-known local museums

like the Military Museum in Riyadh and the Alshefaa Museum in Jeddah, labels are typically informative and made from high-quality materials. These museums often move beyond basic triangular or square formats, using creative designs to enhance interpretation. For instance, the Science Museum in London uses digital technologies to give more context and places labels directly on objects (Figs. 16-17). Labels at the Natural History Museum are combined with objects and directional indicators to help visitors navigate the narrative of human evolution. Skull models and timeline markers are merged with the labels, making the narrative easier to follow (Fig. 18). Both the British Museum and the Military Museum in Riyadh use digital screens to display maps and supplementary information that text labels alone cannot convey (Figs. 19-20). Large-font labels and pictures are placed above displays at the Alshefaa Museum to make them easier to see (Fig. 21).

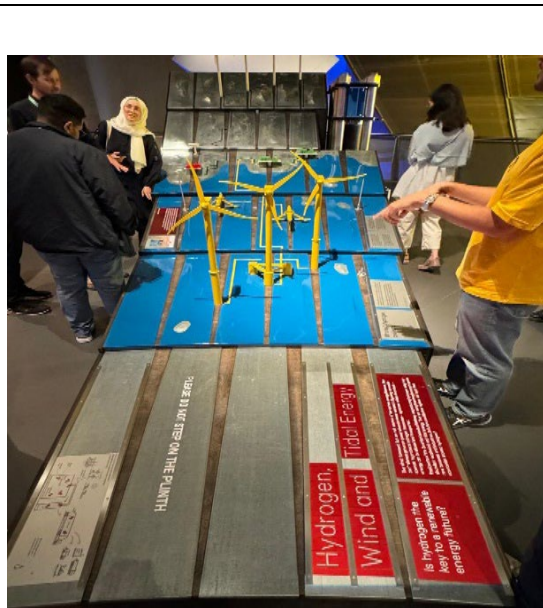


Fig. 16, *Clean Energy Innovations Exhibit*, taken on July 04, 2024, High-quality durable labels, *Energy Revolution: The Adani Green Energy Gallery* (opened 26 March 2024), Science Museum, London, UK. [Photograph by author].

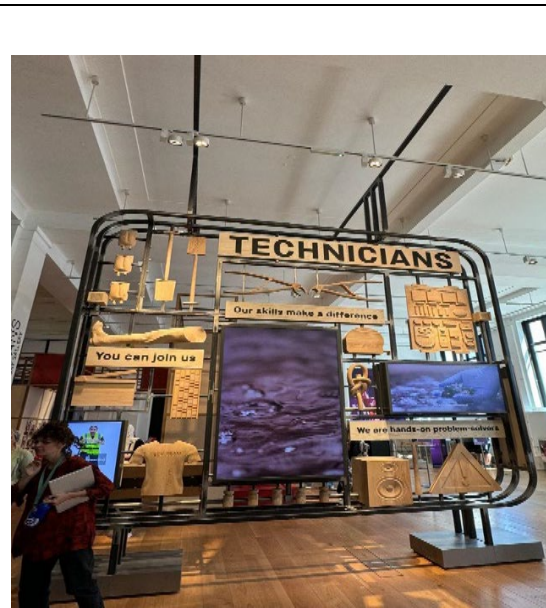


Fig. 17, *Technicians Exhibit*, taken on July 04, 2024, Digital screens, models, and text panels, *Technicians: The David Sainsbury Gallery* (opened 3 November 2022), Science Museum, London, UK. [Photograph by author].



Fig. 21, Overhanging Descriptive Labels Above Display Cases, taken on September 21, 2024, Hanging text panels, Alshefaa Museum, Jeddah, Saudi Arabia. [Photograph by author].

The Etihad Museum demonstrates the successful integration of technology with text-based interpretation. Beneath the text, bilingual displays show the United Arab Emirates (UAE) Constitution in Arabic and English (Fig. 22). Moreover, a touchscreen shaped like the UAE map provides bilingual content on infrastructure, the economy, and cultural traditions through an engaging visual experience (Fig. 23).



Fig. 22, Bilingual Interactive Displays of *the Constitution*, taken on February 19, 2025, Digital screens and text panels, Etihad Museum, Dubai, UAE. [Photograph by author].



Fig. 23, Interactive Bilingual Touchscreen Display Shaped as the UAE Map, taken on February 19, 2025, Digital touchscreen, Etihad Museum, Dubai, UAE. [Photograph by author].

Effective object labels not only inform visitors but also actively engage them through storytelling, contextual detail, and interactive prompts. Labels engage visitors through brief storytelling. Many great examples are illustrated in the British Museum's Albukhary Foundation Gallery of the Islamic World (AFGIW) (Figs. 24-25). *Dark Water, Burning World* by Issam Kourbaj uses storytelling and poetic text to highlight the refugee experience through symbolic boat sculptures (Fig. 24). The *Egypt and Syria: Slaves and Sultans (1250–1517)* display label provides historical context alongside objects, highlighting the political and cultural shifts under Mamluk and Ottoman rule (Fig. 25). Moreover, the British Museum explains the history of writing by providing detailed contextual labels for each object in the display. Each object includes details regarding its origin, material composition, function, contextual relevance, and significance for writing (Fig. 26). Additionally, labels can engage visitors by prompting questions or actions. For example, an interactive display at the Science Museum features a colorful label encouraging people to create music and investigate sound through physical engagement (Fig. 27).



Fig. 24, Issam Kourbaj, View of Boats from *Dark Water, Burning World*, taken on July 19, 2024, Small boats made from bicycle mudguards and burnt matches, AFGIW, British Museum, London, UK. [Photograph by author].



Fig. 25, Interpretive Display of Egyptian and Syrian Objects in *Slaves and Sultans (1250–1517)*, taken on July 19, 2024, Brass basin, painted ceramic bowl, and silver objects, AFGIW, British Museum, London, UK. [Photograph by author].

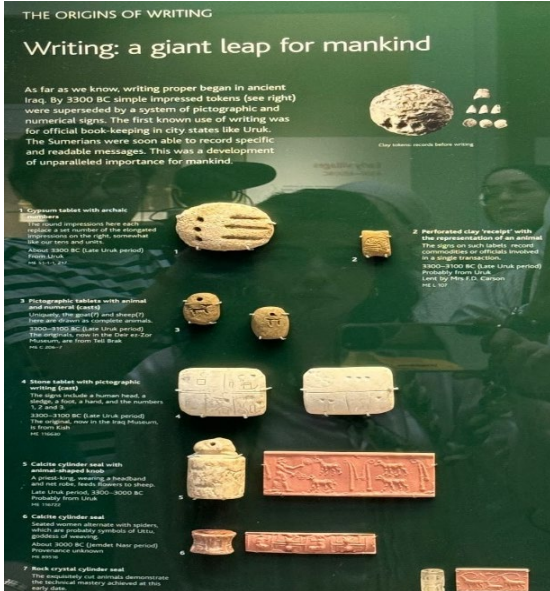


Fig. 26, The Origins of Writing: Objects and Interpretive Label in Room 55 (Mesopotamia 1500–539 BC), taken on July 15, 2024, Clay and stone objects with text panel, British Museum, London, UK. [Photograph by author].

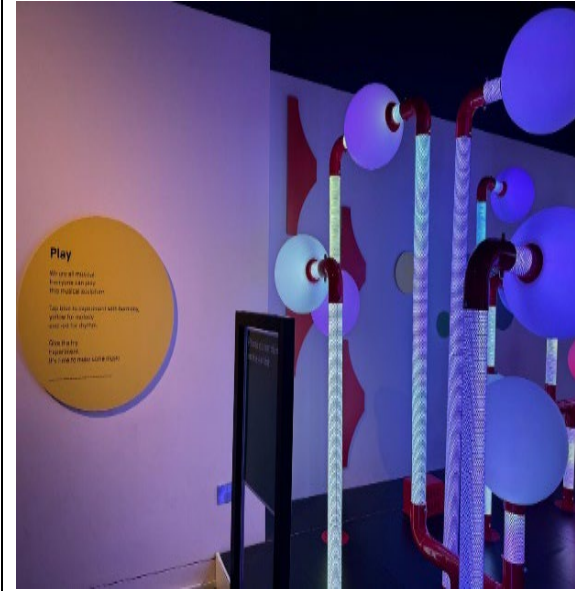


Fig. 27, Interactive Exhibit with “Play” Label and Instructions, taken on July 04, 2024, Instructional panel with lights and piping, Science Museum, London, UK. [Photograph by author].

3.3 Expert Insights on Enhancing Labeling Practices and Standards

To support the analysis of object labeling, three experts were interviewed (see Section 2.2 for ethical considerations). Their insights highlight the importance of language clarity, audience-centered interaction, narrative alignment, thoughtful visual design, and accessibility, reinforcing the recommendations of this study.

The experts were asked to identify the primary components that contribute to the effectiveness of object labels in promoting visitor engagement, comprehension, and accessibility across various audience segments. Active engagement and concise language were emphasized by all three experts. One anonymous expert advised using clear language and accurate descriptions to avoid both complexity and oversimplification (Anonymous expert, personal communication, May 2025). Another noted that labels should be tailored to the target audience's knowledge, behaviors, and expectations in order to both inform and entertain. The debate centers on whether labels should primarily inform or engage. A strong label guides the visitor's experience, encouraging exploration and attention to key features. For instance, a label might prompt: "Observe the subject's gaze—what could their expression indicate regarding their emotions or social standing?" Such cues support thoughtful analysis (Anonymous expert, personal communication, May 2025). Similarly, Sundus Al-Rashid highlighted the importance of clear, concise language as well as appropriate font and size to ensure readability and comprehension (S. Al-Rashid, personal communication, June 2025).

The experts were also asked about the main challenges they face when designing or evaluating bilingual or multilingual museum labels. One expert noted that translation complicates the explanation of archaeological content for visitors,

emphasizing that text should be carefully crafted using appropriate and intelligent vocabulary in both Arabic and English (Anonymous expert, personal communication, May 2025). Another expert identified several challenges related to multilingual labels, including the need to understand the museum's audience before selecting which languages to use. The expert gave examples: the Egyptian Museum in Turin uses Arabic and Italian to serve a growing Arabic-speaking refugee population, while some institutions introduced Chinese-language labels based on expected visitor numbers—without confirming whether Chinese tourists actually engaged with them. Indian visitors, most of whom speak English, may still face issues if Hindi is used unnecessarily. The expert emphasized avoiding literal translations and instead adapting content to maintain clarity, tone, and narrative consistency across languages. Multilingual labels should reflect audience needs and support inclusive, purposeful communication (Anonymous expert, personal communication, May 2025). Sundus Al-Rashid emphasized the importance of concise labeling, observing that overly detailed text can hinder visitor engagement (S. Al-Rashid, personal communication, June 2025).

The experts were asked whether font size, style, contrast, and label placement improve object label readability and visitor engagement, especially for diverse audiences. One expert suggested linking explanations directly to objects through numbering or barcodes to improve access to information. At the NMSA, the expert criticized the shift from plastic cube numbers to small stickers, arguing that this change hinders visitors' ability to locate relevant information (Anonymous expert, personal communication, May 2025). Another expert emphasizes that visual design should help visitors recall the exhibition's message rather than merely follow visual trends or standard formats. Based on the exhibition's goals, the names of artists, dates,

and the cultural context should be visually prioritized. For example, if the exhibition has a timeline, dates should be visible; if the artist is the focus, their name should come first. Standard guidelines, such as those from the International Council of Museums (ICOM), can be helpful, but they should not take priority over the exhibition's central message. Additionally, the expert emphasizes the importance of consistent label positioning. Considering cultural reading habits—such as the right-to-left orientation in Arabic—layout choices should guide the visitor accordingly. Design elements such as font size, contrast, and layout should support clarity without distracting from the content. The expert believes that a label's success is measured by what visitors remember—essential ideas and insights—rather than by its visual design. For example, if a visitor leaves the Uffizi Gallery without comprehending the Renaissance masters' names and legacies, then the labels, however elegant or high-tech, have failed. Therefore, visitor evaluation should prioritize knowledge retention and emotional involvement over aesthetics, as these factors determine design effectiveness (Anonymous expert, personal communication, May 2025). Sundus Al-Rashid claimed that all visual design elements matter and should be considered when planning an exhibition. She notes that bright or reflective surfaces can discourage reading, small fonts may be difficult for older visitors, and placing text too high makes it inaccessible for wheelchair users (S. Al-Rashid, personal communication, June 2025).

The experts were also asked how object labels can be designed to support an exhibition's narrative structure while enhancing emotional engagement and learning and were invited to provide examples of labels that effectively contribute to this goal. One expert recommended that explanations should be provided for each object individually, not for the group, even if the objects are similar or share a display case.

Label tone, language, color, size, and height should remain consistent throughout the gallery. This expert observed that consistent labeling at the NMSA significantly improved the visitor experience (Anonymous expert, personal communication, May 2025). Another stated that labels are most effective when they connect visitors to objects and provide meaning. For this to happen, curators and audience specialists should collaborate from the start, identifying the audience, desired learning outcomes, emotional responses, and insights. Labels should prompt reflection, raise questions, and create lasting impressions. The expert underscored the importance of label interaction, noting that unlike digital content or catalogs, labels should make an immediate impact during the visitor's encounter with the object. A good example was a label created by an expert for a portrait of Oliver Cromwell at the Pitti Palace, which included his famous quote to create an emotional connection with British visitors. This moment of recognition and engagement illustrates how a well-designed label can foster both understanding and personal connection (Anonymous expert, personal communication, May 2025). Moreover, Sundus Al-Rashid stated that pleasant, emotionally engaging language connects visitors with the display, while excessive jargon or dry facts can deter them. For instance, the poetry of the Qatar National Museum's founder helps create a strong emotional connection between the museum, the land, and its people (S. Al-Rashid, personal communication, June 2025).

All experts provided examples of accessibility improvements in museum labeling, particularly for people with disabilities and non-native speakers. One expert mentioned a Braille booklet previously created at the NMSA for visually impaired visitors. It offered an introduction to the museum and its collections before entry. Although the number of visually impaired visitors was low and the overall impact limited, the expert regarded it as a meaningful initiative that could become more

effective with greater support and wider implementation (Anonymous expert, personal communication, May 2025). Another expert described the Children's Museum at Louvre Abu Dhabi. The labels were initially designed for children. Over time, they developed into multi-sensory experiences that engaged visitors of all ages, languages, and abilities. Each label included tactile materials, contextual sounds, short narratives in sign language, Braille, and even specific scents reflecting the objects' original environments. These features were fully integrated into the visitor experience, encouraging deeper interaction with the displays. While this approach may not be suitable for every exhibition, it illustrates how multi-sensory design can enhance inclusivity and engagement. According to the expert, formal evaluations and observed visitor behavior confirmed its success—visitors stayed longer, interacted more, and showed sustained interest (Anonymous expert, personal communication, May 2025). Sundus Al-Rashid noted that many museums offer Braille, hearing loops, translations, and large-print materials for visitors with disabilities. In her experience, these tools enhance accessibility when they are thoughtfully designed and easy to use (S. Al-Rashid, personal communication, June 2025).

Expert perspectives in this study highlight shared principles of best practices in object labeling: clear language, audience engagement, narrative and emotional impact, thoughtful visual design, and accessibility. These principles, supported by findings from case studies and visitor surveys, form the foundation of the practical recommendations proposed in this research.

3.4 Survey Insights from Museum Visitors

An anonymous visitor survey was conducted over four days in May 2025 to complement interviews and observations. Its aim was to gather direct feedback on the clarity, design, and readability of object labels. As shown in Tables A1 and A2 (List of Tables), the survey sample included sixty-nine participants: sixty-two visitors to the NMSA and seven visitors to other local museums in Saudi Arabia. Most respondents described themselves as infrequent museum visitors, suggesting that the sample reflects the public rather than experts or regular attendees. The majority were aged eighteen to fifty-nine, and most were Arabic speakers. However, fourteen visitors indicated a different first language, including English, Mandarin, German, Russian, Spanish, Thai, Hindi, and Urdu. This linguistic variety offered significant insights into the efficacy of bilingual labeling procedures. The survey results indicated that 97% of visitors stated they read some or most of the object labels. This shows a generally high level of interaction with the museum labels. Despite 80% of respondents being Arabic speakers, merely 43% assessed the labeling as “very clear.” Additionally, 46% characterized them as “somewhat clear,” although a minority 10% deemed the labels “difficult to comprehend.” This variance, while not severe, highlights the necessity to improve label readability and presentation, especially for non-native speakers. In addition, 83% of visitors reported learning something new during their visit, and 81% stated that the labels helped them engage with the objects or historical content. Some participants also described feeling “inspired” or “curious,” suggesting that the labels supported both intellectual and emotional aspects of their museum experience. Moreover, 71% indicated a preference for digital upgrades, such as QR codes, audio guidance, or interactive elements.

Building on the general findings, Table A2 (List of Tables) presents more detailed visitor responses regarding the best practices in labeling. The clearest visitor priorities were clear language (68%), readable font size (65%), and bilingual or multilingual content (62%), reinforcing earlier observations and expert insights. Additional helpful features included background storytelling (52%), label placement near the object (39%), and visual elements such as images or diagrams (38%). The following were suggested as improvements: increasing font size, simplifying and clarifying the language, incorporating QR codes for detailed content and audio features, enhancing visual and lighting design, integrating emotional and narrative storytelling, providing more English and additional languages, ensuring accuracy and regional diversity in information, placing labels closer to relevant objects to reduce clutter, and including interactive or sensory elements to boost visitor engagement.

The survey results align with observations from on-site visits and interview responses, emphasizing the need to improve label design. Key areas include readability, consistent bilingual content, the effective use of storytelling techniques, and the integration of digital tools to enhance content accessibility and enjoyment. Visitors frequently highlighted font size, clear language, and bilingual content as crucial characteristics. They also valued thoughtful label placement, visual elements, and narrative context. These observations directly influence the design concepts and recommendations outlined in the next chapter, including the proposal for a practical handbook.

Chapter 4: Handbook: Best Practices for Object Labeling in Saudi Museums

4.1 Principles of Best Practice in Object Labeling

This section builds on the expert perspectives (Section 3.3) and visitor survey insights (Section 3.4) by presenting key best practices from the literature to inform engaging and accessible object labeling. Successful object labels use clear communication techniques to capture attention, support reading, and tell a story. Willis (2019) explains that most visitors read labels for only a few seconds. Museum visitors usually stand, and many things can distract them. As a result, labels should be short, clear, and well-organized. Willis (2019) states that using simple words, clear titles, short sentences, and emotional language can help visitors stay interested. Moreover, keeping each paragraph to fifty words or fewer also improves readability and visitor engagement. Storytelling effectively engages visitors, as they are more attracted to narratives than to isolated facts. Willis (2019) also refers to Freeman Tilden's principles, which suggest that labels should convey meaning, stimulate curiosity, and show real enthusiasm to keep people's attention and teach useful information. To use these techniques effectively, it is crucial to begin with a defined interpretive strategy. This involves choosing the exhibition's central theme, target audience, available space, number of panels, and textual strategy. Museum professionals should consider the educational interests of their audience before writing. For example, speaking with visitors or asking them directly can help ensure that the labels address their needs and questions. These steps are especially important for the NMSA and other Saudi

museums aiming to enhance visitor comprehension of objects, foster inclusivity, and facilitate cultural connections.

However, current studies warn against always putting strict limits on label length. According to Reitstätter et al. (2022), well-written explanatory labels, even those that are longer, can significantly help people understand and become more interested in artworks. The study at the Austrian Gallery Belvedere reveals that longer, well-written texts get people to think more deeply about what they are reading. This suggests that what the label says and how it relates to the object can matter more than keeping it brief. This point aligns with Falk and Dierking's (2013) Contextual Model of Learning, which emphasizes that learning outcomes are shaped by both content and the broader context of the visitor's experience.

These contrasting perspectives indicate that no single labeling strategy is universally effective. Rather, success depends on how labels respond to diverse visitors' needs. The Contextual Model of Learning offers a robust theoretical framework for understanding how such engagement occurs across multiple dimensions. This model conceptualizes museum learning as the dynamic result of interactions between three overlapping contexts: personal, sociocultural, and physical (Schwartz, 2013). According to Schwartz (2013), the personal context includes a visitor's prior knowledge, interests, goals, and level of control over their learning experience. The sociocultural context encompasses social interactions and the effects of peer or facilitator mediation, which shape meaning development. The physical context includes the museum's layout, exhibition design, lighting, label placement, and directional indicators. These elements interact continuously, meaning effective learning cannot be isolated to a single factor. Instead, successful interpretation depends on how well labels accommodate these layered influences, supporting

orientation, facilitating engagement, and offering opportunities for choice and control. This model highlights the importance of developing labels that are informative, accessible, and tailored to the comprehensive learning context of visitors, especially in museums such as the NMSA.

Building on the importance of contextualized learning, Constructivist Learning Theory offers additional insight into how museums can promote deeper visitor engagement. According to Hein (1998), Constructivist Learning Theory views learning as an active and context-dependent process shaped by prior knowledge and individual experience. Hein (1998) argues that visitors learn best when museums provide intellectually, physically, and socially accessible environments that support meaning-making. Constructivist Learning Theory emphasizes that knowledge is generated by the learner through participation and reflection. Best practices in label design have to go beyond textual simplicity toward encouraging interaction with the object's surroundings. Story-driven labels, questions that inspire curiosity, and interpretive language allow visitors to connect displays with their personal narratives or cultural frames. For Saudi museums like the NMSA, which serve a diverse public, this approach encourages deeper visitor engagement by promoting interpretation. However, while Constructivist Learning Theory provides a valuable foundation, it may fall short in meeting the needs of audiences with limited prior knowledge and does not offer detailed guidance on label structure or cultural adaptability. Therefore, using constructivist principles in label writing enhances readability and attention, as well as the potential for meaningful, self-directed learning when combined with practical and context-sensitive techniques. This directly supports the handbook's aim of creating labels that invite visitors to engage, reflect, and connect displays with their own cultural frames.

Complementing these educational theories, a recent scholarship explores the use of storytelling to interpret objects with limited contextual information. Van de Ven and Costello (2024) critique traditional archaeological labels for concentrating solely on a singular phase of an object's existence. The authors stress that this approach frequently overlooks wider historical and cultural aspects, particularly when the object's provenance is ambiguous. The authors suggest employing storytelling tactics to generate interest in object biographies despite the presence of missing records. Van de Ven and Costello (2024) reference a bronze figurine from the Musée L collection, and use the terms "chat" and "group chat" to convey details regarding the object's material, function, user, and provenance. Their method is based on archival research and comparisons with objects from the Harvard Art Museums. Although it demonstrates potential, it is constrained as it depends solely on a single sample and lacks visitor feedback. Nonetheless, the integration of narrative and object biography offers valuable direction for interpretive strategies in Saudi museums—particularly when dealing with artifacts of uncertain origin.

Certain Saudi museums, particularly the NMSA, continue to use labels that are not visitor friendly. Many labels only describe the object; they neither tell stories nor consider the visitor's knowledge or emotions. Labels can be improved by drawing on Willis's focus on clarity, Tilden's emphasis on interpretation, and frameworks such as the Contextual Model of Learning and Constructivist Learning Theory. These approaches help museums develop labels that are inclusive, engaging, and comprehensible. They facilitate learning by linking the content to the visitor's background and experiences.

4.2 Label Writing and Design Guidelines

Labels for objects should be clear, brief, and easy to understand. Visitors can better understand essential ideas when they are presented in clear, concise language, organized logically, and in a location that is easily accessible. MuseumNext (2024) outlines strategies for engaging diverse audiences, including knowing your audience and avoiding jargon; keeping text short (about fifty to one hundred words); starting with an engaging hook; using simple, active language; focusing on one main idea; connecting to familiar concepts; using storytelling to create emotional connections; ensuring inclusivity through clear language, contrast, and multilingual options; testing labels with visitors; and applying appropriate size, spacing, and placement for readability. Together, these practices make labels easier to read, more interesting, and more transparent for visitors. These label writing and design principles are especially relevant for the NMSA and other Saudi museums, where clarity, effective placement, and bilingual presentation are essential to support diverse audiences and improve visitor engagement.

While clarity and simplicity are essential, they do not guarantee that visitors will engage with labels. Screven (1992) challenges this assumption, arguing that even well-written and accessible labels are often ignored if they do not reflect how visitors behave in galleries. A lot of people walk through exhibitions without reading the labels. Labels that have no connection to their interests, prior knowledge, or reasons for visiting rarely attract attention. Screven (1992) highlights a discrepancy between label-writing practices and visitors' experiences, noting that museums often adopt a curatorial rather than a visitor-centered approach. Screven's critique indicates a transition to visitor-centered communication models within museum theory. Labels

should be both readable and sufficiently meaningful or engaging to justify visitors' time and effort.

As Sundus Al-Rashid (Section 3.3) notes, labels with too much text or complex language can confuse visitors and reduce their impact. One way to improve this is by involving visitors in writing labels, which can increase clarity and engagement. Nashashibi (2003) investigates the potential of inviting people to write exhibit labels to foster communication and engagement between museums and their audiences. Nashashibi (2003) focuses on the San Jose Museum of Art and four additional museums in the United States, revealing that this approach enhanced interpretive inclusion and promoted visitor engagement. Visitors participated as active contributors to the exhibition, offering diverse perspectives. The study relied on staff surveys, interviews, case studies, and observation of visitor behavior. However, it did not include formal surveys of visitors, which limited insight into their personal experiences. Additionally, since the research focused solely on five museums in the United States, its findings may not be applicable to museums in other regions or countries.

Beyond language and tone, visual design choices—such as font size, layout, and placement—play a crucial role in visitor engagement with object labels. Environmental psychology studies, such as those by Bitgood, show that physical placement influences attention and cognitive engagement. Bitgood and Patterson (1993) have shown that increasing label font size leads to higher reading rates among museum visitors. Label placement may have a greater effect on attention than visual design. Winter (2021) has shown that the positioning of a label inside the gallery significantly influences visitor attention and engagement more than its design; labels that are prominently placed and encountered early in the visitor's path are more likely

to be observed and read. Winter (2021) uses a multimodal methodology, integrating direct observation, interaction analytics, and a systematic rating instrument to assess “attention potential.” This approach offers robust, data-driven insights into the influence of placement on engagement. However, the study does not include visitor interviews or surveys to explain why certain placements attract greater engagement.

These findings align with the survey results, where more respondents identified placement as the most important factor (39%) than design (29%). This suggests that Saudi museum labeling improvements should emphasize visibility, physical accessibility, and clarity of information. Taken together, the evidence indicates that placement is critical to label impact. A well-designed label does more than convey information—it draws visitors in and encourages deeper engagement with the object. According to anonymous experts (personal communication, May 2025), effective labels also depend on consistent placement, clear layout, strong contrast, and cultural sensitivity, such as using right-to-left alignment for Arabic readers. Labels that follow these principles are more likely to be noticed, understood, and remembered.

4.3 Accessibility Considerations

Museums should not depend solely on text but need to address the needs of both people with disabilities and the public. According to Dodd and Sandell (2001), museums are responsible for reducing inequality and supporting inclusion.

Accessibility is more than a legal or technical requirement; it is also a moral and cultural duty to serve diverse audiences. This means eliminating mental, physical,

linguistic, and social barriers that prevent some people from accessing museum materials. The authors argue that museums should do more to include groups that are often excluded. Well-designed object labels are central to this aim because they enable museums to communicate clearly and respectfully with all visitors. Universal Design (UD) labels can improve accessibility, support multimodal engagement, and enhance labeling processes. These methods are consistent with the Contextual Model of Learning, developed by Falk and Dierking (2012), which highlights how visitor engagement is shaped by the interplay of personal, sociocultural, and physical environments. UD labels can incorporate audio descriptions, tactile elements, and clear visual icons to enhance inclusiveness. According to Molinier (2023), accessibility can be further enhanced through wheelchair-friendly placement, illustrated and simplified text, 3D tactile and sensory modules, Braille translation, and sign-language videos for deaf visitors. Molinier (2023) explores how UD principles can be applied to museum labels to promote inclusivity and communication for all visitors, particularly those with disabilities. The study proposes a “universal label” that combines multiple communication methods—such as Braille, sign language, and easy-to-read text—into a single accessible format. Easy-to-read language uses clear words and short sentences to support people of different backgrounds, including those with intellectual disabilities, non-native speakers, children, and older adults. Molinier (2023) also criticizes fragmented approaches to accessibility and advocates for integrated solutions. The Mona Lisa label at the Louvre demonstrates how UD principles can be applied in practice: a revised version includes features like Braille Neue, the Luciole font, and sign-language visuals. The study also introduces a typology of label formats to guide the creation of inclusive museum texts. However, the main challenges include a lack of staff training in disability-inclusive practices

and the financial and logistical difficulties of creating fully accessible labels. The research examines international accessibility guidelines and charters from organizations such as the UNCRPD, ICOM, UNESCO, and the Louvre. Section 3.3 includes an example from the Children's Museum at Louvre Abu Dhabi that demonstrates how multisensory design can enhance accessibility. Lessons from this and UD principles can guide future improvements in Saudi museum labels.

UD offers a practical framework for enhancing accessibility, but some experts caution that a fully universal approach may not always be feasible in museums. As discussed in the expert interviews (Section 3.3), Sundus Al-Rashid states that labels should be clear and simple to use, warning that excessive text or complexity can discourage reading and undermine key messages. Willis (2019) likewise warns that too many layers of text panels may deter readers rather than attract them. Museums should balance inclusivity and clarity rather than adding every accessibility feature to every label.

While Molinier (2023) proposes a comprehensive UD framework that integrates visual and tactile modes, Khrisna et al. (2023) reveal how the absence of skilled translation and contextualization undermines accessibility, especially for international audiences. Together, these studies highlight the need for both inclusive design and linguistic-cultural accuracy. Khrisna et al. (2023) examine the accessibility and translation quality of bilingual Indonesian–English labels at the Radya Pustaka Museum in Surakarta, Indonesia, from the perspective of international tourists. The study utilized a descriptive qualitative methodology to examine label content, integrating surveys, interviews, and focus group discussions with museum personnel. The results reveal issues with physical presentation, readability, and clarity, including grammatical mistakes, unclear phrasing, and difficulties in communicating Javanese

cultural terminology to non-native speakers. Errors in the original Indonesian text often led to poor translations. The authors advocate employing skilled translators, improving the source material, and incorporating contextual information to enhance museum labeling. The study underscores the importance of multilingual labeling to enhance visitor experience. The restricted sample size of three international tourists limits the generalizability of the results. The lack of comparative research with other museums and the limited discussion of technological options, such as digital labeling, restrict the broader applicability of its suggestions. Nevertheless, the study provides an extensive examination of accessibility challenges associated with translation and establishes a foundation for future research focused on interviews and comparative analysis to assess the impact of multilingual labeling on non-Arabic-speaking visitors in Saudi museums, including the NMSA.

In addition to visual and physical accessibility, cognitive accessibility is essential in museums; clear, consistent, and simplified label design helps neurodiverse visitors and aligns with UD principles. The research conducted by Martins and Gabriele (2013) largely addresses digital technologies and physical accessibility; nonetheless, its focus on cognitive processes and UD principles can be applied to museum object labeling. Label design is important for visitor understanding and interaction; it is a core component of a museum's interpretive framework. Applying insights from Martins and Gabriele (2013), labels should be clear, easy to navigate, and designed with the needs of all visitors in mind, including those with cognitive, visual, or learning difficulties. This means using precise wording, consistent layouts, images, and audio or tactile alternatives whenever possible. In this way, their study supports the idea that good labeling is not just a matter of personal taste when it comes to design, but a necessary component of ensuring everyone can have a

meaningful and inclusive museum experience. While their research does not include user testing or direct analysis of label design, it offers a valuable framework that supports this study's focus on improving object labeling practices in Saudi museums.

Object labeling should comply with UD principles to guarantee accessibility across visual, cognitive, linguistic, and multisensory dimensions. Dodd and Sandell (2001) argue that accessibility is more than a matter of compliance—it is also an ethical obligation to support inclusion. Research by Molinier (2023), Martins and Gabriele (2013), and Khrisna et al. (2023) highlights the importance of inclusive design, effective translation, and multimodal engagement in improving visitor experiences. These practices align with initiatives already being implemented by leading institutions. For example, Frameless in London provides mobile guides and audio descriptions in many languages, accessible via QR code. Moreover, the Museum of Islamic Art in Qatar, the Islamic Arts Biennale, Ithra, and HIA all use bilingual labels with equal Arabic and English text, equal font sizes, and QR codes to provide additional information. These examples informed the proposed best-practice handbook guidelines, which aim to improve accessibility in Saudi museums through transparency, welcoming environments, and digital readiness.

4.4 Digital and Interactive Elements

Expert interviews and visitor surveys revealed ongoing concerns regarding labeling, including unclear information, low engagement, and accessibility issues. Experts and visitors have suggested using QR codes, audio options, and interactive displays to enhance personalized learning and increase visitor engagement. Notably, 71% of

surveyed visitors expressed interest in digital features such as QR codes or interactive labels (see Table A1). The findings suggest that Saudi museums, such as the NMSA, should move from conventional text labels toward more adaptable, multimodal approaches. Digital interpretation, when well-designed and aligned with visitor needs and curatorial goals, should be viewed as a key component of accessible and inclusive labeling, not just an added feature.

Building on these findings, digital and interactive tools—such as QR codes, smart screens, and visual icons—are increasingly used in museums to supplement static text and promote deeper engagement. For example, Roberts et al. (2018) evaluate three touchscreen rail designs in a Chinese history exhibition to determine if interactive digital labels can increase museum visitor engagement. A standard label format (“Original”), a question-oriented design (“Big Questions”), and an interactive timeline (“Timelines”) are tested for visitor engagement and interest. Using design-based observation, the researchers measured stopping rates, interaction levels, engagement length, and discussion quality in 834 visitor groups over forty hours. The Big Questions and Timelines designs engaged visitors better than the Original. However, Big Questions limited the discussion, and Timelines facilitated inquiry but diminished the focus on artifacts. Researchers employed recognized museum learning frameworks to analyze transcribed visitor conversations, with particular emphasis on interpretation, reading behavior, curiosity, and inquiry. Nonetheless, relying on a single, rarely studied Bronze Age China artifact may limit the study’s applicability to other topics or cultures. This study demonstrates how specific touchscreen formats can enhance engagement and provides transferable design insights for Saudi museums, including the NMSA.

Other studies explore QR codes as an accessible digital tool for promoting interactivity. Chivarov, Ivanova, Radev, and Buzov (2013) designed and assessed an interactive museum system at the Bilkent University Library Art Gallery in Ankara, which incorporates QR codes, mobile devices, a web-based exhibit database, and museum Wi-Fi to enhance visitor interaction. Visitors scanned QR codes located at each exhibit to access multimedia content—text, photos, and audio—through a smartphone application. In a field study involving sixty-three participants, visitors were divided into two groups: one group used standard exhibit labels, while the other group scanned QR codes to access digital content. Average Holding Time and Attracting Power were used to measure engagement. The QR-enabled group spent significantly more time with exhibits—approximately 507 seconds on average—compared to around 358 seconds for the label-only group, demonstrating that mobile interaction effectively increases visitor dwell time. Additionally, the authors discuss the technical architecture of the system, which includes a QR generator, a web portal, an electronic database, and a wireless setup. This provides museums with a valuable plan for implementing the system. Nevertheless, the authors note several limitations: some older visitors experienced difficulties setting up and scanning the devices; the placement of the QR codes made them harder to read; and the pilot's scope was limited in terms of sample size, exhibit variety, and interaction duration, which may constrain generalizability.

By contrast, Pérez-Sanagustín, Parra, Verdugo, García-Galleguillos, and Nussbaum (2016) offer a more cautious view. Their study at the Royal Botanic Gardens found that only 3% of visitors using QR codes viewed digital videos, compared to 97% in the screen group. Although QR codes were used in conjunction with a more thorough reading of the exhibit text, they did not enhance multimedia

engagement. A later test with two-way QR codes that allowed visitors to leave comments resulted in more extended visits; however, it did not alter how positively people perceived the experience. The authors conclude that the effectiveness of QR codes depends on content design, the level of interactivity, and the user's age and technological proficiency. Compared to Roberts et al. (2018), who found that interactive touchscreen formats encouraged visitor inquiry and engagement, Pérez-Sanagustín et al. (2016) emphasize that QR codes may be less effective unless intentionally designed for seamless use. This comparison underscores the importance of digital strategies, particularly in meeting the diverse expectations of museum audiences. Poorly designed digital tools may unintentionally hinder rather than enhance the visitor experience. It is also worth noting that the two experiments took place in distinct settings—one in a public botanical garden with mostly adult visitors, and the other on a university campus with college students. Neither setting is an official museum, but both are regarded as “museum-like” due to their exhibitions designed to educate and engage the public. Direct comparisons of the results are complicated by differences in environment and audience, which limit their generalizability to all museum contexts.

Digital technologies may enhance museum visits, but this is not a given; how well they work depends on how effectively they are utilized. When QR codes are used in Saudi museums, including the NMSA, they should be carefully reviewed to ensure they meet the needs of all visitors and align with local cultural values. Customizing digital technologies to provide bilingual content, facilitate navigation, and incorporate culturally relevant narratives can enhance the engagement and accessibility of museum experiences. Hein's (1998) constructivist framework for museum education is based on the idea that well-designed technologies can facilitate hands-on learning

by encouraging research, inquiry, and personal connection. This aligns with Falk and Dierking's (2012) Contextual Model of Learning, which argues that visitors' emotional, sociocultural, and physical surroundings significantly influence their understanding of the world. Digital tools can respond to these layers by supporting multimodal and multilingual exploration if they are carefully designed and implemented. This means that digital tools for museums, such as the NMSA, should be customized to serve both local and international visitors, with multilingual content and user-friendly interfaces. For example, QR codes could link to mobile content tailored for tourists, school groups, and visitors with sensory impairments, each of whom has distinct accessibility needs.

4.5 Recommendations for Implementation

Recommendations for implementation include the creation of a labeling handbook that outlines clear design standards, detailed procedures, staff training protocols, and systems for ongoing evaluation. A handbook within the framework of the NMSA and other Saudi museums would function as a practical resource to promote consistency, enhance staff expertise, and facilitate continuous advancements in label design and visitor communication. Gertler, Martinez, Premand, Rawlings, and Vermeersch (2016) demonstrate that the use of manuals and clear guidelines enhances work consistency, improves staff competencies, and facilitates more effective tracking and evaluation, ultimately resulting in superior outcomes. In the context of museums, creating a labeling handbook can facilitate the uniform implementation of the best practices in

label design, thereby promoting clarity, accessibility, and engagement throughout exhibitions.

To strengthen the impact of these implementation steps, the labeling handbook should incorporate established educational and accessibility frameworks. Falk and Dierking's (2012) Contextual Model of Learning emphasizes that interpretation arises from the interaction of personal, social, and physical contexts. The handbook can enhance label designs that are significant and contextually relevant by considering elements such as visitor background, social context, and label placement.

Additionally, Hein's (1998) Constructivist Learning Theory supports designing labels that encourage active engagement, helping visitors build new knowledge through personal reflection and interaction. Integrating UD principles (Molinier, 2023) makes labels more accessible to people with diverse abilities and learning preferences using clear language, tactile elements, and multilingual support. These models work together to create a practical, inclusive, and research-driven methodology to enhance object labeling in Saudi museums.

Practical steps can be identified to improve label effectiveness in Saudi museums, specifically by aligning design strategies with visitors' cognitive behaviors and attention patterns. Bitgood's (2000) model offers a conceptual framework grounded in cognitive psychology that explains how attention shapes visitor engagement with interpretive labels. The research identified three main factors: selectivity (visitors notice what is important), motivated concentration (people focus more when information is clear and distractions are reduced), and restricted capacity (visitors tend to have limited attention spans). These principles clarify why isolated objects accompanied by well-structured labels tend to capture greater visitor attention. As noted earlier, concise labels with strategic placement and visual aids best capture

attention. The study's limitations include a lack of empirical data. Focusing on psychological and educational literature strengthens label design theory. This study provides a solid foundation for investigating how people interact with museum labels. Bitgood's (2000) model can be applied to non-Western, bilingual contexts such as the NMSA. Observing and interviewing visitors at the NMSA and other Saudi museums can reveal how label design influences engagement and understanding, establishing a foundation for future improvements.

In developing the proposed handbook, it is essential to include both theoretical frameworks and the viewpoints of museum experts and visitors. Experts' interviews conducted for this study offered consistent recommendations: object labels should employ clear and concise language, correspond to audience knowledge levels, maintain narrative consistency, and ensure visual accessibility through appropriate font sizes, contrast, and placement. These insights align closely with the survey responses of museum visitors. While most participants reported reading the labels, fewer than half found them very clear, pointing to gaps in clarity, layout, or translation. Visitors also stressed the value of bilingual content, readable text, narrative storytelling (52%), and digital enhancements such as QR codes (25%) and audio features (29%). These findings reinforce the need for design standards and digital features that are user-centered and linguistically inclusive. This alignment between expert and visitor perspectives highlights the importance of developing a labeling strategy that responds to real-world needs and museum experiences.

While a structured handbook offers many benefits, some researchers caution that strict rules may limit creativity or ignore the specific needs of different organizations. Romary (2010) argues that establishing rigid standards can occasionally "freeze knowledge," hindering the ability to adapt to change. The handbook should be a

flexible guide that ensures consistency but also allows museums to adapt it to their needs.

In closing, the handbook aims to provide a practical, flexible framework that draws on expert experience, visitor expectations, and established learning theories. It is designed to help Saudi museums create object labels that are clear, inclusive, and engaging for diverse audiences, positioning them to meet both local and international expectations.

Chapter 5: Conclusion

This dissertation examined object labeling in Saudi museums, with a focus on the NMSA. The aim was to explore how design, bilingualism, and accessibility influence visitor engagement and understanding. The study utilized observations, expert interviews, and a visitor survey, revealing that although labels are frequently read, numerous instances showed inconsistency, interpretative challenges, or limited inclusivity.

The first research question examined how labels at the NMSA support or hinder engagement. The study found that while labels attract attention, they often fail to maintain it. Problems with clarity, font size, and lack of visitor-focused communication reduce their impact. This supports Screven's (1992) view that labels often follow curatorial priorities rather than visitor needs, which weakens their role as learning tools. The second question looked at what practices from other museums could guide improvements in Saudi Arabia. Examples from the British Museum, Science Museum, Ithra, and Louvre Abu Dhabi showed the benefits of concise bilingual text, storytelling, and digital features that encourage interaction. The third question explored what should be included in a handbook for Saudi museums. Experts and visitors emphasized the importance of clear bilingual content, digital tools, and accessible design that reflect cultural and linguistic differences, consistent with Falk and Dierking's (2012) model of learning.

This study proposes a best practice handbook with practical steps to improve label design, accessibility, and digital integration. It is tailored to Saudi museums by

adapting international standards to local needs. The NMSA could pilot the handbook, review the outcomes, and provide evidence for wider adoption across the sector.

Although the study covered only a few museums and visitors, it offers a solid base for future research to test the handbook further and explore new digital approaches.

In conclusion, labels are more than informational texts; they are interpretive tools that connect visitors with objects and heritage. By emphasizing clarity, diversity, and innovation, Saudi museums may enhance visitor education and engagement. The proposed handbook allows for the establishment of regional benchmarks and contributions to global museum practices.

List of Illustrations

- Fig. 1, Label for Spice and Aromatic Trade, taken on August 29, 2024, photograph, showing a paper label, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 13.
- Fig. 2, Nephsh – Type Stele Label, taken on August 29, 2024, photograph, showing a paper label, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 13.
- Fig. 3, Arabic-Only Label Without English Translation, taken on August 29, 2024, photograph, showing a paper label, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 13.
- Fig. 4, Damaged Label on Prophet’s Mosque Model Exhibit, taken on August 29, 2024, photograph, showing a glass case with a descriptive label printed on A4 paper label, Islam and the Arabian Peninsula Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 13.
- Fig. 5, Ancient Artifact Display with Missing Mask, taken on August 29, 2024, photograph, showing a gold and gemstone jewelry display, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 14.
- Fig. 6, Central Mask in Ancient Artifact Display from Virtual Visit, taken on August 29, 2024, photograph, showing a gold and gemstone jewelry display, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 14.
- Fig. 7, Label for Missing Mask in Ancient Artifact Display, taken on August 29, 2024, photograph, showing a paper label, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 14.
- Fig. 8, Bilingual Label with Inconsistent Historical Periods, taken on August 29, 2024, photograph, showing a paper label, Arabian Kingdoms Gallery, NMSA, Riyadh, Saudi Arabia. [Photograph by author]. p. 14.
- Fig. 9, A Story of "Tobba-King of Himyarite Kingdom" with the People of Medina Labels, taken on April 03, 2025, photograph, showing a small English paper label placed alongside a large Arabic marble label, Dar Al-Madinah

Museum, Madinah, Saudi Arabia. [Photograph by author]. p. 15.

Fig. 10, Arabic-only label for the display of the Prophet's Cave (Ghar Hira) on al-Noor Mountain, taken on April 03, 2025, photograph, showing a large Arabic marble label, Dar Al-Madinah Museum, Madinah, Saudi Arabia. [Photograph by author]. p. 15.

Fig. 11, Folio of a Qur'an Manuscript Label, taken on December 03, 2024, photograph, showing a bilingual paper label, Museum of Islamic Art, Doha, Qatar. [Photograph by author]. p. 16.

Fig. 12, The Inner Sanctuary Label, taken on April 25, 2025, photograph, showing a bilingual paper label, Islamic Arts Biennale, Jeddah, Saudi Arabia. [Photograph by author]. p. 16.

Fig. 13, *Horizon Up and Down (Land) Label*, taken on September 07, 2024, photograph, showing a bilingual paper label with a QR code for a detailed description, *Net Zero exhibition*, Ithra, Dhahran, Saudi Arabia. [Photograph by author]. p. 17.

Fig. 14, Juglet Label, taken on September 21, 2024, photograph, showing a bilingual paper label with a QR code for the audio guide, HIA, Jeddah, Saudi Arabia. [Photograph by author]. p. 17.

Fig. 15, Language Selection and Accessibility Options on the Frameless Website (accessed via QR code), captured on July 19, 2024, website screenshot, showing multiple language choices and options for sign language, audio description, and music, Frameless, London, United Kingdom, [<https://guide.frameless.com>], screenshot by author, p. 17.

Fig. 16, *Clean Energy Innovations Exhibit*, taken on July 04, 2024, photograph, showing durable materials with labels crafted from high-quality material, *Energy Revolution: The Adani Green Energy Gallery* (opened 26 March 2024), Science Museum, London, United Kingdom. [Photograph by author]. p. 18.

Fig. 17, *Technicians Exhibit*, taken on July 04, 2024, photograph, showing digital screens, durable models, interactive components, and informative text, *Technicians: The David Sainsbury Gallery* (opened 3 November 2022), Science Museum, London, United Kingdom. [Photograph by author]. p.18.

- Fig. 18, *Human Ancestry Timeline*, taken on July 08, 2024, photograph, showing fossil replicas, durable labels, and directional timeline markers, Human Evolution Gallery, Natural History Museum, London, United Kingdom. [Photograph by author]. p. 19.
- Fig. 19, Digital Map Display, taken on July 19, 2024, photograph, showing a digital display on a screen, The Albukhary Foundation Gallery of the Islamic world (AFGIW), British Museum, London, United Kingdom. [Photograph by author]. p. 19.
- Fig. 20, Digital Visualization of Firearms Development, taken on September 04, 2024, photograph, showing a digital display on a screen, Military Museum, Riyadh, Saudi Arabia. [Photograph by author]. p. 19.
- Fig. 21, Overhanging Descriptive Labels Above Display Cases, taken on September 21, 2024, photograph, showing books, display cases, objects, text panels, Alshefaa Museum, Jeddah, Saudi Arabia. [Photograph by author]. p. 20.
- Fig. 22, Bilingual Interactive Displays of *the Constitution*, taken on February 19, 2025, photograph, showing digital screens and bilingual text panels, Etihad Museum, Dubai, United Arab Emirates. [Photograph by author]. p. 20.
- Fig. 23, Interactive Bilingual Touchscreen Display Shaped as the United Arab Emirates Map, taken on February 19, 2025, photograph, showing a digital touchscreen, Etihad Museum, Dubai, United Arab Emirates. [Photograph by author]. p. 20.
- Fig. 24, Issam Kourbaj, View of Boats from *Dark Water, Burning World*, taken on July 19, 2024, photograph, showing small boats made from bicycle mudguards and burnt matches, AFGIW, British Museum, London, United Kingdom. [Photograph by author]. p. 22.
- Fig. 25, Interpretive Display of Egyptian and Syrian Objects in *Slaves and Sultans (1250–1517)*, taken on July 19, 2024, photograph, showing a large brass basin, painted ceramic bowl, and silver objects, AFGIW, British Museum, London, United Kingdom. [Photograph by author]. p. 22.
- Fig. 26, *The Origins of Writing: Objects and Interpretive Label in Room 55 (Mesopotamia 1500–539 BC)*, taken on July 15, 2024, photograph, showing clay and stone objects with a text panel, British Museum, London, United

Kingdom. [Photograph by author]. p. 22.

Fig. 27, Interactive Exhibit with “Play” Label and Instructions, taken on July 04, 2024, photograph, showing an instructional panel, lights, and piping, Science Museum, London, United Kingdom. [Photograph by author]. p. 22.

List of Tables

Visitor Survey Tables

Table A1

Summary of Key Survey Findings from 69 Visitors at the National Museum of Saudi Arabia and Local Museums (May 2025)

Survey Indicator	Key Finding
Total respondents	69 visitors (62 National Museum of Saudi Arabia, 7 Various local museums in Saudi Arabia)
Age range	Mostly between 18–59
Gender	Male and Female
Language	Arabic and English speakers
Visit frequency	Primarily occasional museum-goers
Read most or some labels	97%
Arabic speakers	80%
Labels rated “very clear”	43%
Learned something new	83%
Felt connected to objects/history	81%
Interested in digital features	71%

Note. Percentages are based on total responses (N = 69).

Table A2

Responses to the Survey Question on Object Label Reading

Question	Response	Number of Visitors
Did you read the object labels?	Yes, most of them	42
	Some	25
	None	2
Age Group	Under 18	3
	18–29	21
	30–44	24
	45–59	16
	60+	5
Gender	Female	40
	Male	29
Are you an Arabic speaker?	No	14
	Yes	55
What is your first language?	non-Arabic	14 (5 English, 1 Mandarin, 1 German, 1

		Russian, 3 Spanish, 1 Thai, 1 Hindi, 1 Urdu)
	Arabic	55
How often do you visit museums?	Frequently	23
	Occasionally	46
Were the labels easy to read and understand?	Difficult to understand	7
	Somewhat clear	32
	Very clear	30
What made the object labels effective?	Font size	45
	Clear and accessible language	47
	Bilingual or multilingual content	43
	Background or storytelling	36
	Visual elements (e.g., images, diagrams)	26
	QR code for extra information	17
	Integration with digital media (video/audio)	20
	Interactive e-labels	8
	Label placement near the object	27
	Too much text	4
	Too little text	17
	Label design and layout	20
Did you learn something new from the object labels?	Yes	57
	No	4
	Not sure	8
Did the labels help you connect with the objects or history?	Agree	27
	Disagree	2
	Neutral	9
	Strongly agree	29
	Strongly disagree	2
Did your visit make you think differently about a topic or idea?	Yes	57
	No	12
How did the object labels make you feel during your visit?	Inspired – They sparked reflection	25

	Curious – I wanted to learn more	37
	Confused – The information wasn't clear	8
	Indifferent – They didn't affect my experience	3
	Excited – They enhanced my enjoyment	16
Would you like object labels to include more interactive or digital features (e.g., videos, QR codes, touchscreens)?	Yes	49
	No	7
	Maybe	13
Suggested Improvement	Increase font size, simplify language, and improve clarity	
	Add QR codes for detailed info, audio, or tactile features	
	Improve visual design of labels and surrounding lighting	
	Improve lighting conditions around objects and labels	
	Add background stories, emotional context, and narrative flow	
	Provide more English and additional languages (e.g., Chinese)	
	Ensure accuracy and regional diversity in object information	
	Position labels near relevant objects and reduce clustering	
	Add interactive or sensory features for engagement	

Note. Multiple selections were allowed for effectiveness and improvement questions.

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