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Harnessing Technology at Oman Natural History Museum

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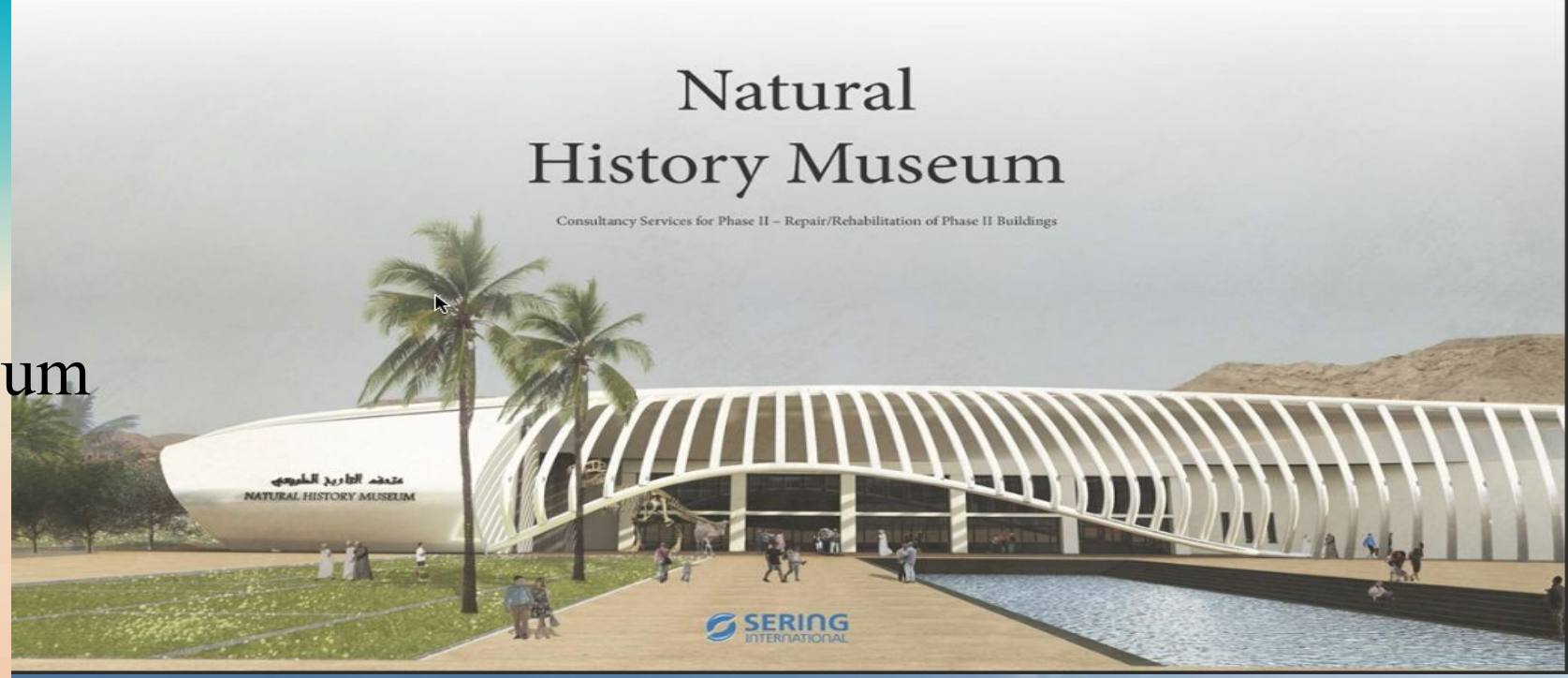
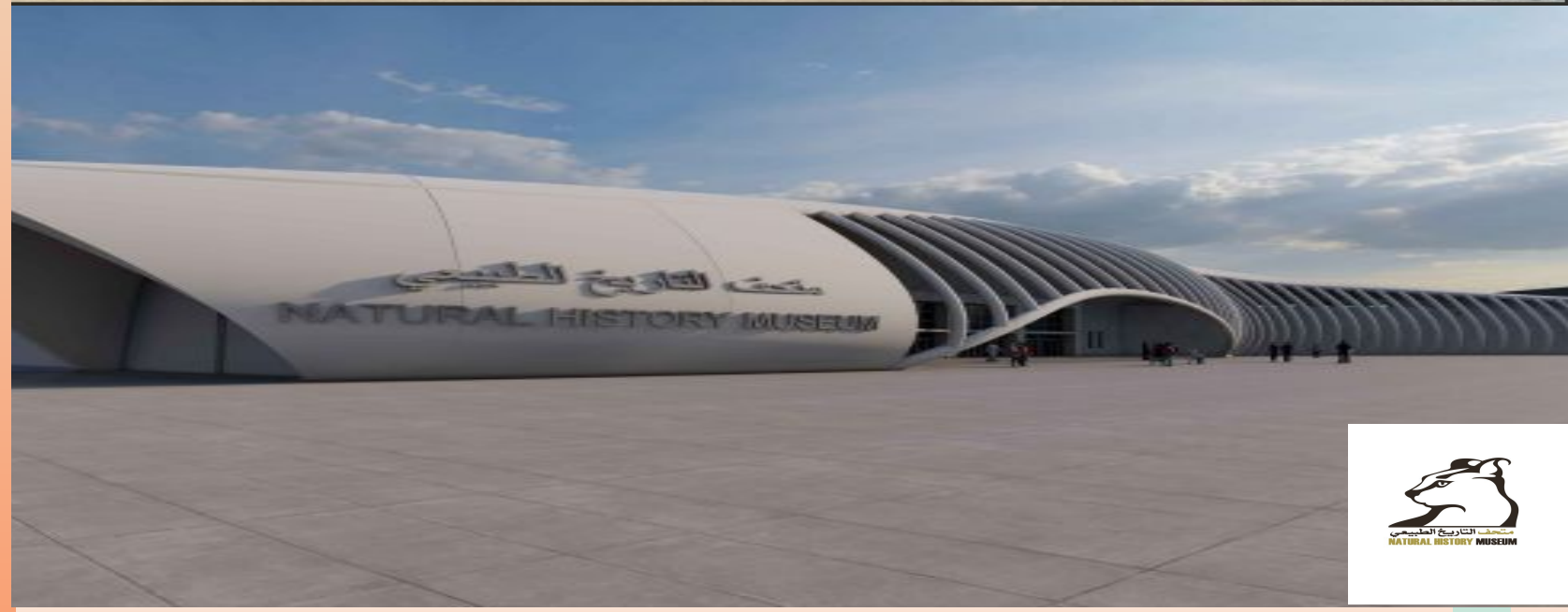
11-17/2026

PROPOSAL TYPE





Harnessing Technology at Oman Natural History Museum

متحف التاريخ الطبيعي
NATURAL HISTORY MUSEUM

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Abstract

At the Natural History Museum of Oman, technology plays a transformative role in enhancing visitor experiences, advancing scientific research, and preserving the Sultanate's rich natural heritage. We have implemented web-based interactive tours using virtual reality (VR), allowing remote audiences to explore our museum in an immersive, engaging way. Also, as part of our commitment to education and outreach, we have also launched a new awareness program for schools, utilizing VR technology to reach students in remote governorates across Sultanate of Oman. This initiative is designed to inspire curiosity about biodiversity, and conservation among young learners. In addition, On the preservation front, we have embraced digital technology to safeguard and manage our scientific collections. To date, we have digitized nearly 13,000 herbarium vouchers and 800 marine algae specimens, ensuring long-term conservation and easier access for researchers and scholars. Our collections database is developed using Oracle APEX, chosen for its flexibility, robustness, and security. This modern platform allows us to efficiently manage, search, and analyze collection data, while ensuring data integrity and scalability for future growth. Beyond improving the efficiency of daily operations, it opens new avenues for scientific research, digital archiving, and international collaboration.

متحف التاريخ الطبيعي
NATURAL HISTORY MUSEUM

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01 INTRODUCTION

Oman Natural History Museum

The Natural History Museum serves as a vital platform for education and the preservation of natural heritage, with technology playing a pivotal role in enhancing the visitor experience and efficiently managing collections. By integrating modern technologies such as virtual reality (VR), augmented reality (AR), and interactive displays, the museum can offer engaging educational activities that attract students and visitors of all ages, deepening their understanding of natural sciences and history. Additionally, digital technologies, such as advanced databases and artificial intelligence, contribute to documenting collections, monitoring their condition, and ensuring their sustainable preservation, enabling precise and effective management of museum collections. This integration of technology with education and collections management makes the Natural History Museum an innovative hub for knowledge and exploration.

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DEVELOPMENT AND DEPLOYMENT OF VIRTUAL REALITY FOR CURRENT OMAN NATURAL HISTORY MUSEUM

https://my.matterport.com/show/?m=Hm6EzA4guve

Development and Deployment of Virtual Reality for current ONHM in 2018

https://x.com/ONHM85/status/1156798646559694853

The three-dimensional design (virtual reality) for the museum and the Whale Hall was launched in 2018 as a step to bring the public closer to the Natural History Museum, aiming to enhance the promotional and marketing aspects of the museum locally and internationally. The Natural History Museum was the first local museum in sultanate of Oman to implement a virtual reality design. The importance of virtual museums lies in transcending the boundaries of time and space, enabling interaction with virtual exhibits, and simulating a realistic environment using the internet, where virtual tours can be conducted via digital links provided by the museum to its audience. Also, the virtual reality of NHM of Oman was used and activated during the period of museum closures in the COVID-19 pandemic (2020-2021).

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03

USING VR TO RAISE AWARENESS ABOUT OMAN NATURAL HISTORY IN REMOTE SCHOOLS

Risa Awareness About Oman Natural History in Remote Schools

- Using Virtual Reality (VR) technology to raise awareness about natural heritage in Oman—especially in remote schools—is an innovative and impactful step toward enhancing knowledge and strengthening national identity.
- Teachers and Students in remote areas can virtually visit and Access Natural history Museum Remotely.
- Interactive Experience: VR allows students to interact with exhibits at natural history museum, enhancing understanding and making learning more enjoyable.
- Inclusive Education: VR provides equal learning opportunities for students with disabilities or mobility challenges.
- Promoting Eco and Cultural Tourism: Students learn the value of natural heritages, encouraging preservation and appreciation.
- Educational initiatives aim to integrate VR technologies into school curricula, opening new horizons for learning in non-traditional environments.

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DIGITIZATION AND DEVELOPMENT OF OMAN NATURAL HISTORY COLLECTIONS SYSTEM

Oman Natural History Collections

Natural History Museum in the Sultanate of Oman is responsible for preserving and archiving the natural heritage and biodiversity, including 40,000 specimens of Oman’s biodiversity. The oldest specimen is an herbarium voucher collected in 1943. Approximately 13,000 herbarium vouchers, 800 vouchers from marine algae, and 500 fossil specimens have been digitized.

The modernization of the Natural History system represents a paradigm shift in the management of Oman's Natural Heritage. It not only improves the efficiency of day-to-day operations but also opens new horizons for scientific research and digital preservation of precious collections. The internal development of the system reflects the outstanding technical capabilities of the Ministry's team and enhances the long-term sustainability of the project and data.

Why Digitize and develop new system for Oman Natural History Collections

The previous system relied on Microsoft Office applications, specifically Excel and Access, which led to a range of operational and technical challenges, including:

Data dispersion: The presence of multiple and separate databases has led to difficulty in managing information uniformly.

Limited storage: The system's reliance on individual computers that are constrained in storage capacity has negatively affected system performance.

Poor security: Manual backups and storage in external media putting data at risk of loss or hacking.

Concurrent use limitations: Inability to support multiple users simultaneously hindering productivity.

Limited functionality: Inability to attach multimedia such as images and files to records.

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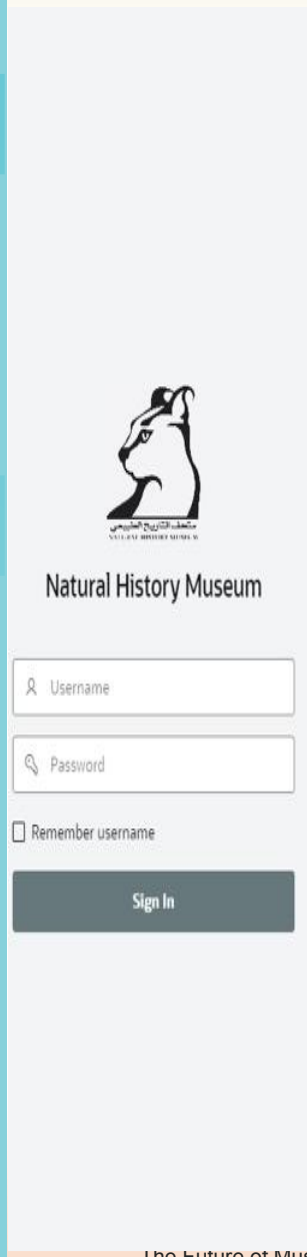
NEW SYSTEM OF NATURAL HISTORY COLLECTIONS

https://museum.mht.gov.om/ords/r/museum/natural-history-museum200/login?session=2937196652042



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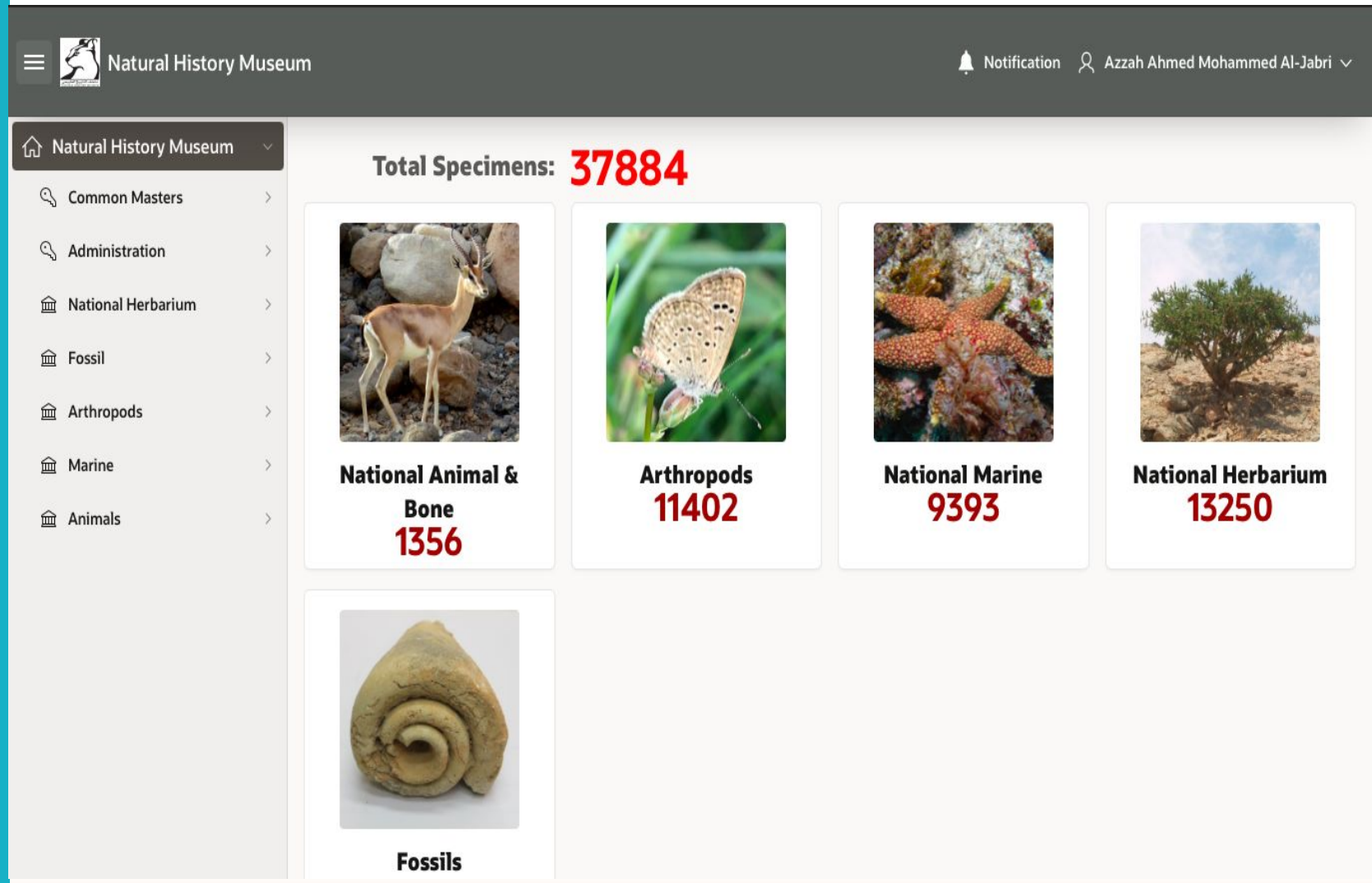
FRONT PAGE OF THE NEW SYSTEM



Advantages of the new system

Integration: A unified database that ensures consistency of information across all scientific groups.

Develop a public interface of the system to enhance public access to scientific information.

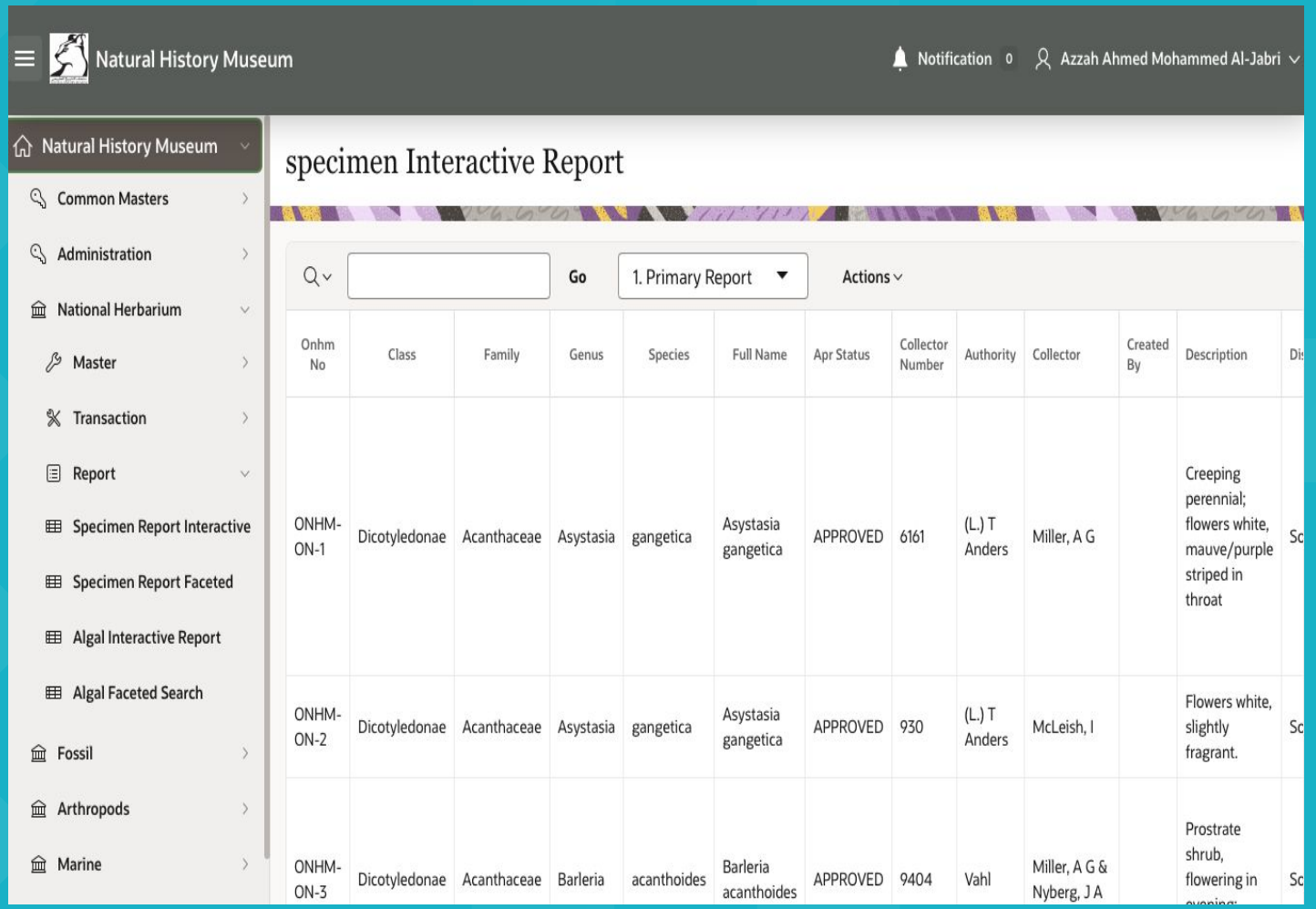
Flexibility: Remote and cross-device access while ensuring data security.

Expansion: High absorptive capacity that meets the needs of the future growth of groups.

Advanced functions: Support multimedia attach and create sophisticated reports.

Enhanced security: Automated backup system and advanced security measures to protect data.

Workflow optimization: Intuitive user interfaces that speed up data entry and management and reduce human error.



Onhm No	Class	Family	Genus	Species	Full Name	Apr Status	Collector Number	Authority	Collector	Created By	Description
ONHM-ON-1	Dicotyledonae	Acanthaceae	Asystasia	gangetica	Asystasia gangetica	APPROVED	6161	(L.) T Anders	Miller, A G		Creeping perennial; flowers white, mauve/purple striped in throat
ONHM-ON-2	Dicotyledonae	Acanthaceae	Asystasia	gangetica	Asystasia gangetica	APPROVED	930	(L.) T Anders	McLeish, I		Flowers white, slightly fragrant.
ONHM-ON-3	Dicotyledonae	Acanthaceae	Barleria	acanthoides	Barleria acanthoides	APPROVED	9404	Vahl	Miller, A G & Nyberg, J A		Prostrate shrub, flowering in

Development Process: To address these challenges, a comprehensive methodology were followed to develop the new system:

Strategic analysis: an in-depth study of the existing system and identification of future needs.

Structural design: Develop a scheme for a unified database while maintaining the privacy of each scientific group.

Technology Choice: Oracle APEX is certified as the development platform for its flexibility, robustness, and security.

System development: design user-friendly user interfaces and develop basic and advanced functions.

Data migration: Transfer information from legacy systems while ensuring its integrity and accuracy.

Comprehensive testing: Conduct a series of tests to ensure the efficiency and reliability of the new system.

Training and activation: Implementing a training program for museum staff and gradually launching the system.

Review data for each scientific group separately.

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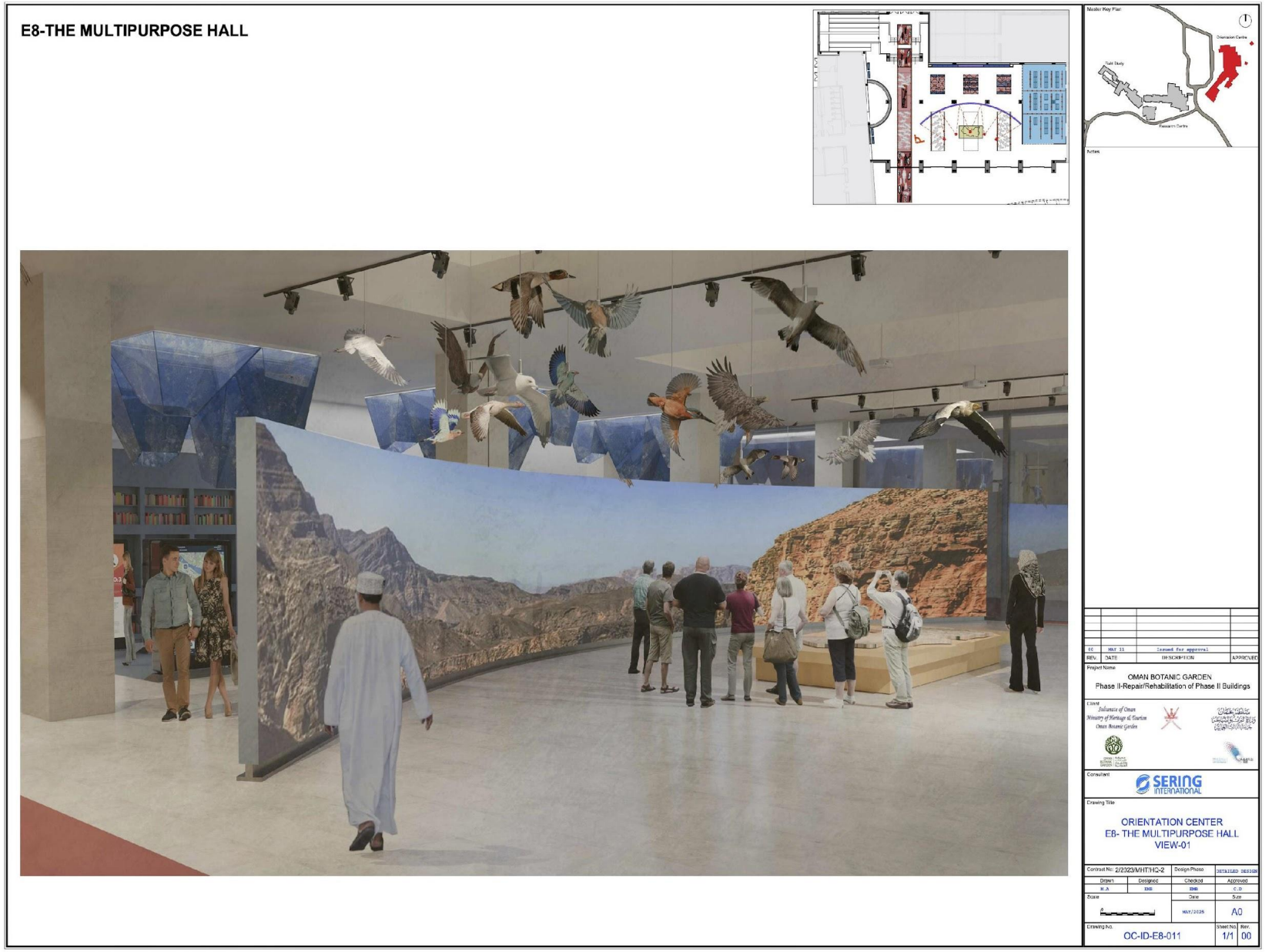
NEW NATURAL HISTORY MUSEUM



Using technology at new theme of Oman Natural History Museum

- Develop and Deploy VR for new theme of ONHM
- Develop and Deploy AR for two scenes of ONHM with ArtGlass company in ICOMDUBAI25
- Museum will offer VR for improrant Biodiversity areas in Sultanate of Oman
- Museum will use AI in museum displayes

Using technology such as virtual reality (VR), ARand artificial intelligence (AI) in the modern version of the Natural History Museum is considered essential for several reasons:

- Enhancing the Visitor Experience: Virtual reality enables visitors to interactively explore natural environments or historical eras, such as simulating the life of dinosaurs or exploring the depths of oceans, making the visit more exciting and educational.
- Enabling Remote Access: As seen during the COVID-19 pandemic, virtual reality can provide virtual museum tours, allowing people from around the world to visit without the need to travel.
- Personalization and Interaction: Artificial intelligence can analyze visitors' interests and offer personalized experiences, such as tailored explanations or instant answers to their questions through intelligent chatbots.
- Resource Preservation: These technologies reduce the strain on sensitive physical exhibits, as digital replicas of rare artifacts can be displayed.
- Attracting Younger Audiences: The use of modern technology attracts younger generations who prefer interactive and digital experiences, ensuring continued interest in museums.

Therefore, integrating these technologies is not only a natural evolution but a necessity to meet modern expectations and ensure the sustainability of museums as educational and cultural hubs.

THANK YOU

Harnessing Technology at Oman Natural History Museum

20-11

Proposal Type