Leveraging AI to enhance services in selected UAE Museums

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Introduction

For a long time, museums and cultural heritage spaces were regarded as symbols of continuity that are expected to retain their historic roles and qualities even in the face of new technologies that define the contemporary world.

Indeed, according to 2021 Museum Innovation Barometer, less than 20% of museums across the world reported the use of AI in their operations (Tykhonova and Widmann, 2021).

However, the lockdowns occasioned by the Covid 19 pandemic in 2020 changed this notion. A 2021 report by the Museums Innovation Centre notes that the pandemic accelerated the production and use of digital content as well as prompted museums to implement digital solutions to manage their collections and stay connected to their audiences (Pasikowska and Lim, 2023).

Problem Statement

- Extant literature is replete with many studies on the adoption of new technologies in museums.

- However, these studies are confined to museums in Europe, the Americas and Australia with limited focus on Asia, and particularly the Middle East.

- Indeed, Hufschmidt (2023) survey on the use of AI in museums across the world provided very scanty information on the adoption of AI in museums in the Middle East and particularly in the United Arab Emirates (UAE).

- This study seeks to fill this research gap by assessing the extent to which museums in the UAE are leveraging AI.

Research Questions

1. The study will be guided by the following research questions:

1. What are the various Artificial Intelligence (AI) tools that can be implemented in museums?

2. In what ways can the identified AI tools be leveraged to enhance services in the museums?

3. To what extent have the identified AI tools been deployed in selected museums in the UAE?

4. What recommendations can be made to optimize the adoption of AI in Museums?

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Research Methodology

This research adopted both quantitative and qualitative research approaches and a survey research design.

Firstly, a survey was conducted in selected museums within the seven emirates of the UAE to identify the AI tools that are in use in the various museums.

Questionnaires were administered to museum staff involved in implementation of AI projects.

The questionnaire comprised of questions addressing the elements of 'tools' and 'organisation' that constitute the AI museum capabilities framework toolkit.

Subsequently, semi-structured interviews were conducted with key respondents in the various museums involved in the implementation of AI projects to gain more insights on how the application of AI tools has enhanced museum services as well as to clarify any emerging issues from the quantitative survey.

The list of museums in the UAE acted as a sampling frame.

Stratified sampling was used to ensure that museums selected were representative of the seven emirates that make up the UAE.

While there are more than 50 museums in the UAE not all have adopted AI.

From a list of an estimated 42 museums, I endeavoured to visit 6 museums in each of the 7 emirates to ensure that the data obtained is representative.

Selected Museums

Abu Dhabi

Louvre Abu Dhabi

Zayed heritage centre

Zayed national museum

<mark>Guggenheim Abu Dhabi</mark>

Qasr Al Watan

Al Ain Palace Museum

Dubai

Museum of the future

Museum of illusions

Etihad Museum

Dubai Police Museum

Naif Museum

Al Shindagha Museum

Sharjah

Sharjah Art Museum

Sharjah Museum of Islamic civilization

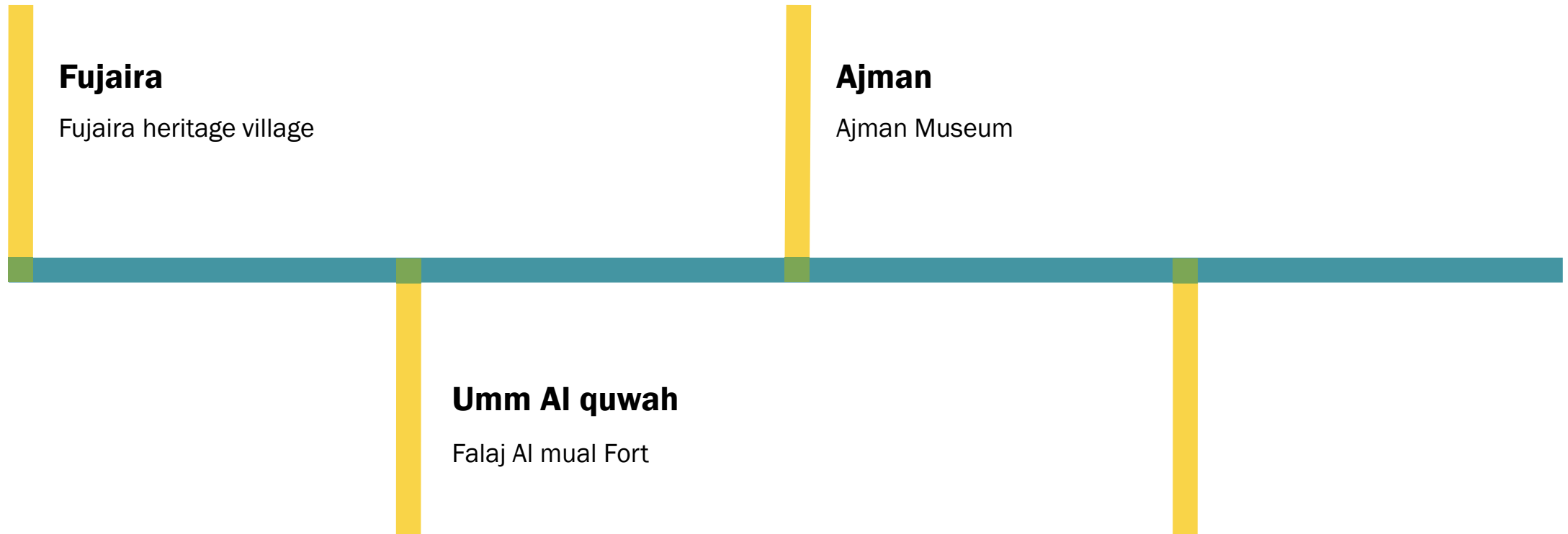Sharjah classic car museum

Sharjah calligraphy museum

Sharjah maritime museum

Mleira Archaeological centre

Ras Al Khaima

National Museum of Ras Alkhaimah

Selected Museums

Fujaira

Fujaira heritage village

Ajman

Ajman Museum

Umm Al quwah

Falaj Al mual Fort

Findings

RQ1: AI Tools that can be implemented in Museums

- Facial Recognition

- Object detection

- Machine learning

- Natural Language Processing

- Robot assistants

- Chatbots

RQ2: Museum operations where AI Tools are applicable

- Tracking visitors' numbers

- Analysing visitors' feedback through sentimental analysis

- Forecasting attendance through predictive analytics

- Cataloguing artefacts through computer vision

- Personalised visitors' experience through chatbots

- Interpreting text-based collections using NLP

- Examining old artefacts using deep learning

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Q3 AI adoption in specific Museums

Louvre Museum Abu Dhabi

- Computational design tech – accuracy of the design and construction process

- AR using ML –intricate dome fit in the surrounding environment

- Art scan App- visitors get content of the artwork on screen in selected languages

- Interactive map-find their way through galleries

- NLP-AI generated content – chatbot explains to visitors

Louvre Museum Abu Dhabi

- AI interactive exhibit. AI and intuition that uses sentimental analysis to understand visitors' movement and emotions and develop customised audio and visual experience.

- Art scan uses image recognition to provide information on artworks through digital labels

Louvre Museum Abu Dhabi

- Interactive map that uses touchscreen capabilities allowing visitors to interact with digital content.

- Recent project where AI is used to extract terms from the Louvre's digital collection to train a machine translation model.

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AI adoption in selected museums

Dubai Museum of illusions

- Interactive exhibits
- Extended reality
- Augmented reality using Machine learning

Dubai Museum of the future

- Interactive exhibits
- Touch screens displaying artwork information
- Robots
- Chatbot

Etihad Museum

- Interactive exhibits
- Touch screens

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AI adoption in selected museums

Sharjah Art Museum

- Interactive exhibits

- Chatbot

Sharjah Museum of Islamic civilisation

- Touch screens

- Interactive exhibits

Abu Dhabi

- Zayed heritage Centre – Interactive exhibits

- Zayed National Museum-Touch screens /interactive tours/virtual voyage

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Summary

AI adoption in museums going forward

- Increased adoption of AI by museums and galleries

- More virtual museums and galleries

- Future museum is expected to be a hub of dialogue and conversation

- Participative museum that is **collaborative, open, accessible and inclusive**

- Participative museums will create personalised experiences for visitors

- Museum work will move closer to entertainment – personalised, immersed, shareable experiences

Areas where AI is applicable

- Collection management

- Exhibition planning

- Visitors' management

Extent of Adoption of AI in Museums in the UAE

The louvre, Dubai Museum of the future and Etihad Museum are leading the pack while the others are still at the early stages.

Extent to which AI projects are strategic, robust and ethical is the next phase of the study.

Thank you