

Research papers:

- 1) <https://dl.acm.org/doi/10.1145/3643834.3660711>
- 2) <https://dl.acm.org/doi/10.1145/3715158>
- 3) <https://dl.acm.org/doi/10.1145/3706599.3719686>
- 4) The paper focuses on how Digital Transformation Technologies (DTTs), including Artificial Intelligence (AI), immersive technologies (AR/VR/MR), and the Internet of Things (IoT), are revolutionising museum exhibitions to create more engaging, inclusive, and personalised visitor experiences. It directly addresses "social mobile computing" by discussing how:
 - Mobile applications and devices are central to delivering personalised visitor experiences, digital guides, and Augmented Reality (AR) experiences.
 - Recommendation systems, often AI-driven and using social network data, provide personalised museum itineraries and suggest exhibits or activities based on visitor interests and past behaviours.
 - Social media integration is used by museums to attract and engage audiences in real-time, disseminate information, and spark cultural discussions, expanding their influence.
 - DTTs facilitate collaborative learning experiences and social connections among diverse individuals through multi-user virtual environments and Mixed Reality (MR), allowing users to collaborate in shared physical spaces.
 - IoT devices collect behavioural and location data on visitors, enabling personalised services and optimising visitor flow.
 - It shows how these technologies build connections between visitors and exhibits, and among visitors themselves, by fostering interaction, personalized learning, and shared experiences.<https://dl.acm.org/doi/10.1016/j.chb.2024.108407>

This paper proposes a hybrid recommender system designed to enhance the museum visitor experience by generating personalised itineraries.

- It integrates social network data (mining opinions and assessments from platforms like Foursquare, Facebook, and Twitter, categorised as negative or positive using machine learning algorithms like Decision Tree, Naïve Bayes, and Support Vector Machine) with Internet of Things (IoT) sensor data (from beacons installed in museums to track visitor behaviour like location and dwell time).
- Through semantic analysis and machine learning, the system builds customised indoor and outdoor itineraries, which are then visualised using Augmented Reality (AR) on a mobile application. AR provides contextual suggestions, like specific viewing angles for artworks, based on both collective opinions and real-time visitor location [45c, 48, 54]. This approach aims to improve engagement, make decision-making easier for visitors, and ultimately lead to a better, more focused museum visit. In essence, the paper provides a foundational example of using integrated social data, sensor technology (IoT/beacons), and AI-driven classification with AR visualisation to deliver a

highly personalised and context-aware museum experience, making it deeply relevant to your domain's goals.

<https://dl.acm.org/doi/10.1007/s10055-018-0366-z>

The method employed by the Social Display Environment (SDE) is a novel approach to museum engagement that **augments physical exhibition objects with user-generated digital content** to foster social interaction and co-production of meaning.

Here's a short summary of the method and its relevance:

Method: The SDE transforms traditional museum showcases by integrating a **see-through window screen** that superimposes digital information onto physical artefacts. These objects are fitted with **RFID tags** for recognition, allowing the system to display associated content. The core of the method is enabling **user-generated content (UGC)**: visitors can **record short video stories and add text comments** about the objects, expressing their personal interpretations, feelings, or critiques. This content can be created directly at the showcase via a webcam, or, in later iterations, more privately using **personal mobile devices by scanning a QR code**. All contributions are stored and displayed, allowing visitors to **watch, rate, and comment on other visitors' stories**, thereby creating "different threads of discussion" and "new narratives" around the objects. This iterative design process, including formative evaluations with real users, was crucial to refine the system.

Relevancy in the Domain: This method is highly relevant to the cultural heritage domain for several reasons:

- **Promoting Active Participation:** It addresses the growing need for **participatory culture** in museums, moving beyond a unidirectional delivery of knowledge to a model where visitors actively **co-produce knowledge and meaning**.
- **Enhancing Engagement and Connection:** By allowing visitors to express and share their unique views, the SDE taps into intrinsic motivators like the need for **socialization, self-actualization, and social recognition**, fostering a deeper, more personal connection with the exhibits and other visitors.
- **Transforming Objects into "Social Objects":** Inspired by Nina Simon's concept, the SDE turns cultural items into focal points for conversation, enabling them to be **personal, active, or provocative objects** that trigger discussion and shared experiences.
- **Maintaining Physical Connection:** A key design principle is to **avoid "physical disconnection"**; the technology augments the real object rather than creating a separate virtual world, keeping the visitor's attention on the actual cultural item.
- **Enriching Exhibition Spaces:** The user-generated content provides "multiple points of view" and "extraordinarily enriches the exhibition spaces" by allowing professional and unprofessional audiences to "tell stories about cultural heritage".
- **Attracting and Retaining Visitors:** The novelty of the transparent screen acts as a "hook" to attract attention, and the opportunities for involvement, including sensorial, intellectual, and emotional engagement, can transform short-term curiosity into more enduring personal interest.