Johnson Museum of Art Analytics

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INTRODUCTION

The Herbert F. Johnson Museum of Art (Fig.1) relies heavily on the **support** of many people to maintain a culturally and intellectually vibrant Cornell community. However, the current data collection and philanthropic information systems the museum has are **outdated and unstructured** to perform sophisticated data analysis.

Our team is **collaborating with contacts** from the Johnson Museum to work on three proposals. Through **modernizing** the internal database and becoming **more informative** about visitors' and donors' behaviors, we believe the Johnson Museum will be able to achieve **increased donations** and create **more engaging visitor experiences**. In this way, we can also help the Johnson Museum build stronger connections to the vast **alumni network** of Cornell, with over **200 thousand** people.

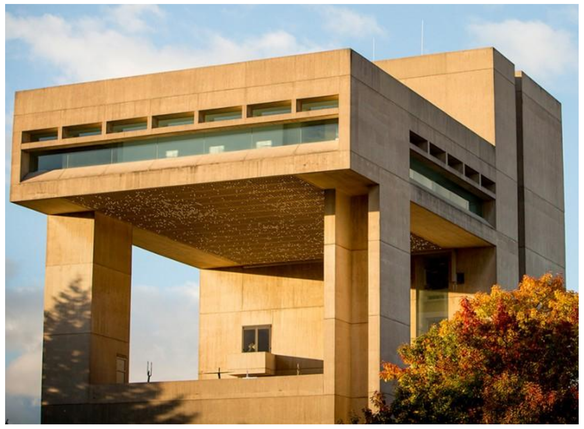

Fig.1. Herbert F. Johnson Museum of Art

QR CODE + DONATION PROPOSAL

Background

- Currently, the Johnson Museum only has donation boxes near the entrance but no **online donation channel**. We propose to attach QR codes to the donations boxes as a mean of online donation.

Implementation

- When scanned, the QR code will lead the visitors to a website (see Fig.2) to enter personal information, including email addresses. At the bottom page, we put the Johnson Museum's **venmo code** for donation. We will send an **automatic thank-you email** to the donor with a brief survey about donor's experience at the Johnson Museum.

Potential Benefits

- In this way, we not only encourage more ways for people to donate but also collect important **visitor and donation information** for our team to analyze visitor's (donor's) behaviors and interests.

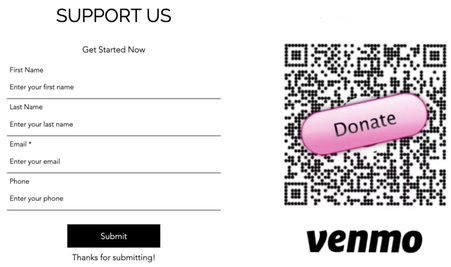

Fig.2. An example website for the visitors to donate and enter information

QR CODE + ARTWORK PROPOSAL

Background

- We are also interested in implementing QR codes on art pieces at the Johnson Museum. Currently, there is one exhibit that uses QR codes to supplement the artworks with further information (Fig.3).

Potential Benefits

- Upon conducting a literature review, the team noticed that QR codes can have additional uses. At the basic level, they can **track statistics** such as the amount of scans (Fig.4). Combining this with the existing database containing all artwork information, we can perform further data analysis to gather insights on the **visitors' interests**.
- Since the museum showcases **10%** of the collection at a time, the team's analysis would enable the museum to **optimize the decision-making** behind works for display. Furthermore, scan data from the QR codes can encourage **donors to continue providing art pieces** after seeing the impact of their donations.

Implementation

- QR codes are currently used to convey information to visitors. However, research shows that museums can achieve a higher level of participation by making them **more aesthetically pleasing and engaging** with the visitors [1].
- To encourage visitors to scan QR codes, the team proposes a plan that includes **customizing the QR codes design** and encourages visitors to partake in active **discussions about the artwork** based on research conducted by [2].

Fig.3. An example of a piece of artwork with QR Code

Fig.4. Potential scan data frequency of scans

PHILANTHROPY DATA PROPOSAL

Data Pre-processing

- To acquire **anonymous** philanthropic data, we are responsible for writing a **Python script** for the Johnson Museum to help replace key donor information (e.g., name and address) with some unique ids.

Potential Data Analysis Methods

- Clustering
  - Partition the donors into different groups based on their similarities to investigate the **common characteristics** among the groups donors [3].
  - Identify the group of donors / type of donation that **contribute the most** to the current donation amount.
  - Evaluates the **payment behavior** of donors in terms of when was the last payment, frequency of the donation and sum of donations.
  - Develop an even deeper understanding of **established donor segments**.
- Feature Importance Analysis
  - **Visualize** the most important factors in the donation amount .
  - Provide insights into **whom to reach out to**.
  - Build models to predict the visitors with given characteristics that are **more likely to donate**.

NEXT STEPS

- Collaborate with staffs at the Johnson Museum to implement the two QR code proposals and establish **long-term partnership** with the Johnson Museum to collect visitor/donor information.
- Request existing **philanthropic data** and build **new databases** for the Johnson Museum (and Cornell University in general) to which machine learning and data science analytics can be more easily applied.

REFERENCES

[1] Ali, S., Koleva, B., Bedwell, B., & Benford, S. (2018). Deepening visitor engagement with museum exhibits through hand-crafted visual markers. *Proceedings of the 2018 Designing Interactive Systems Conference.* https://doi.org/10.1145/3196709.3196786

[2] Gray, S., Ross, C., Hudson-Smith, A., Warwick, C., and Terras, M. 2012. Enhancing Museum Narratives with the QRator Project: a Tasmanian devil, a Platypus and a Dead Man in a Box. In Proc. *Museums and the Web* (MW 2012).

[3] de Vries, N. J., Reis, R., & Moscato, P. (2015). Clustering consumers based on trust, confidence and giving behaviour: Data-driven model building for charitable involvement in the Australian not-for-profit sector. PloS one, 10(4), e0122133.

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