**ADSEE Project**

**Applied Data Science Educational Ecosystem**

**Cultural Heritage and Tourism**

**Applied Data Science Educational Ecosystem**

**Operationalization of Results Whitepaper**

1. Cultural heritage and museums (museology)

Museums, in the sense in which the word is today commonly understood, are obviously a relatively recent phenomenon. The foundation of great publicly funded (and publicly accessible) institutions such as the British Museum or the Louvre stems back to the latter part of the eighteenth century. The concept of museums, however, dates back at least to classical times, if not before (Vergo 1990).

It is important to emphasize that museums are far more than just places of study, or education, or entertainment. The very act of collecting has a political, ideological or aesthetic dimension that cannot be overlooked (Vergo 1990, 2).

Museums judge the value, significance or monetary worth when acquiring material particularly when deciding to put that material on public display or making it publicly accessible. These evaluations are based on the values of the institution which are deeply rooted in our learning, our upbringing, and our prejudices. Whether we like it or not, every acquisition (and indeed disposal), every juxtaposition or every arrangement of an object or work of art, within the context of other objects or works of art, means that the temporary exhibition or museum display establishes certain parameters upon history, whether from the distant or more recent past, from our own culture or someone else's, from mankind in general or from a particular aspect of human endeavor.

The original intention behind the establishment of museums was to remove artefacts from their current context of ownership and usage and from their circulation in the world of private property, and then to insert them into a new environment which would provide them with a different meaning. The main purposes of museums (and what differentiates them from the many extensive private collections which preceded them) was, first, that the significance of the artefacts was assumed to not be arbitrary, and, second, that the collections would be open and accessible to at least a portion of the public which would learn from the experience (Vergo 1990, 6).

Most of the recent literature on museums and the 'heritage debate' is in the form of critical reviews of the messages implied by contemporary museum presentations, and does not often delve into the experiences of those who actually visit these sites. We do not therefore know how people interact with museums and whether they assimilate the messages, either intentional or unintentional, that museums communicate. As a result, museums and exhibitions are rarely planned with a clear understanding of the specific features and expectations of their clientele (Merriman 1990). Q3. What other branches from cultural heritage can you name?

1. Museums and IoT

In the domain of cultural heritage (CH), the focus is on the specific nature of museum visits which present certain patterns and behaviors displayed by visitors while traversing such spaces. These studies can lead to a better understanding of visitors’ needs and can help formulate customized visitor services. These visitors represent a particular class of users which also present multiple challenges for effective behavior monitoring and modelling. This understanding is becoming more and more important for both traditional museums and for technologically aided/augmented versions of them.

The authors present and discuss a data analytics approach relying on an Internet of Things framework. The main goal is to assess how the collection of behavioral IoT data coming from the cultural heritage domain can be opportunely exploited by means of data science and data analytics techniques in order to produce useful insights. Experimental results performed in a real case study demonstrate how the cultural heritage domain, and the related stakeholders, can benefit when Automatic is turned on but is not connected to a network of applications (Piccialli el at, 2019).

Q4: Which museums are the most popular (by visitor per month)?

Q5: What is the artist distribution in the galleries?

Q6: What is the art collection distribution in the galleries?

1. **User Case Block**

**Approach Analysis**

**Descriptive** - designed to get you basic expository information: who, what, when, where, how many?

**Diagnostic** - helps you answer the question of *why* something happened.

**Predictive** - helps you identify the trends in relationships between variables, determines the strength of their correlation, and helps you hypothesise causality.

**Prescriptive** – assists with predicting outcomes based on numerous variables

**Data Selection**

Pay attention and analyze the data set.

Analyze and see if there is a pattern in the museum visitor flow.

Analyze and see the number/ type/ etc. of artifacts.

**Data Science Technique Selection**

How can we visualize the data?

Why the method is important for our data?

1. Data loading
2. Data cleaning and preparation
3. Clustering
4. Visualisation
5. Predictive Methods
6. Pattern recognition

**Model Development**

1. Explore clustering models like K-mean
2. Plotting and visualizing useful statistics

**Sample Data Set Development**

1. Select and focus on “artist” as the criteria of selection
2. Focus on “visitor numbers” across different museums

**Result Decomposition**

1. Number of artists
2. Type of artifacts
3. Visitors’ patterns and behaviors

**Operationalization of results**

Please describe the following aspects:

1. Number of artists
2. Type of artifacts
3. Visitors’ patterns and behaviors
4. Top artists by number per year
5. Revenue by location and museum type
6. Type of artifacts – clustering of artworks by different parameters
7. Visitors’ patterns and behaviors

**References**

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