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Exploring humanity combining Data Visualization with Digital Art

Abstract. The paper presents two interactive installations that make use of datasets about the University of the Republic of San Marino to increase its visibility through Digital Art and meaning. Vibrancy translates sound in a continuously updated materic flow. Its goal is to show the vivacity of the University, quite isolated and located in an ancient monastery in the inner city of San Marino. This, to tell the restless movement that characterizes the School. Vibrancy's software detects, processes and translates noises into movement. Metadata Juice explores human relationships mediated by the Internet, representing invisible data and digital relations generated in the virtual web space. The stream of information comes from the University firewall and its representation is associated with the binary code syntax. Data are translated into a hydraulic circuit, creating simultaneously a connection between analogue and digital realities.

Keywords: Dataset / Digital Art / Dataviz

1. Introduction

University is an anthropologic place, made by people who daily participate to the construction of its identity through culture and knowledge in form of invisible raw data. The paper presents two installations – developed in the Interaction Design Lab 2, taught by Daniele Tabellini, at the University of the Republic of San Marino – that try to explore the character of that site, depicting and processing information from several hidden datasets based on human behaviours. The educational path was articulated through close readings of the projects, practices of Information & Data Visualization and Digital Art.

2. Methodology

The design process has been developed through three phases, turning collected data into physical experiences: Dataset, Dataviz, Dataphys.

The starting question was which type of data to collect as project material. Dataset consisted in a preliminary analysis about the spatial and conceptual context. It was useful to define significant datasets of Unirsm, reading its daily life and discovering its criticalities and strengths. The choices were dictated both by the narrative potential of data and how highlighted their contents aspects (Cairo, 2013). Dataviz allowed finding appropriate expressive forms by associating different datasets, understanding their sources, the elements they are composed of, and their dimensional appearance in relation to their temporal variability (Tufte, 1983). In fact, particular attention was paid to the fourth dimension, time, founding

asset of any dynamic interaction as real-time mapping (Simanowski, 2011). Various graphical interpretations were experimented to identify the most efficient method to communicate datasets. Lastly, Dataphys transposed abstract into physical data. Open source tools such as Processing+ and Arduino were used for software and hardware implementation and the phase was related to the development of physical prototypes. Previous Dataviz depictions were an important preparatory step in assigning a tangible form to shapeless information.

3. Results

The work led to hybrid metamedium artefacts that made legible invisible data (Manovich, 2010). The projects exposed on this paper are Metadata Juice and Vibrancy. Focusing on the behaviours of people who live Unirsm, they study two different dimensions: virtual and physical space.

Metadata Juice explores social relationships between people mediated by internet. The purpose is to represent the humanity of invisible data and digital relations generated in the web space. The stream of information analysed comes from Unirsm firewall. The representation is associated to the binary code syntax, where 0 and 1 mean if people are logged or not in a specific social platform, during the real-time. The installation translates data into a hydraulic circuit, connecting analogue and digital realities. It proposes different levels of reading, from the analytical representation data to the creation of an audio-visual experience.

Vibrancy is an interactive installation which translates sounds in a continuously updated physical flow. The aim is to show the vivacity of Unirsm, quite isolated and located in an ancient monastery in San Marino Città. This to tell the restless movement that characterizes Unirsm. Vibrancy's software detects, processes and translates noises into movement, with the purpose of emphasizing the visibility of the School.

The spatial contextualization of each installation extended data expressivity to a multisensory level, creating different interpretations, ranging from qualitative analysis of information to the creation of an engaging user experience (LUST et al., 2010). The design process showed that the transition from numerical information to sensorial user experience takes place making visible hidden relationship of data with space and people. The installation becomes a collective artefact and the user, from simple observer, now sees its role in the creation of data (Simanowski, 2011).

4. Conclusion

The experiment merged apparently separated domains such as Information & Data Visualization and Digital Art. It highlighted that they share the same design material (datasets) and how processing tools of the first field are nowadays executive medium in visual art (LUST et al., 2010).

In conclusion, the Lab had a double value for Unirsm. It was precious to better understand the inner human nature of the School through invisible data. On the other hand, it found out new ways to tell the external world the identity of San Marino.
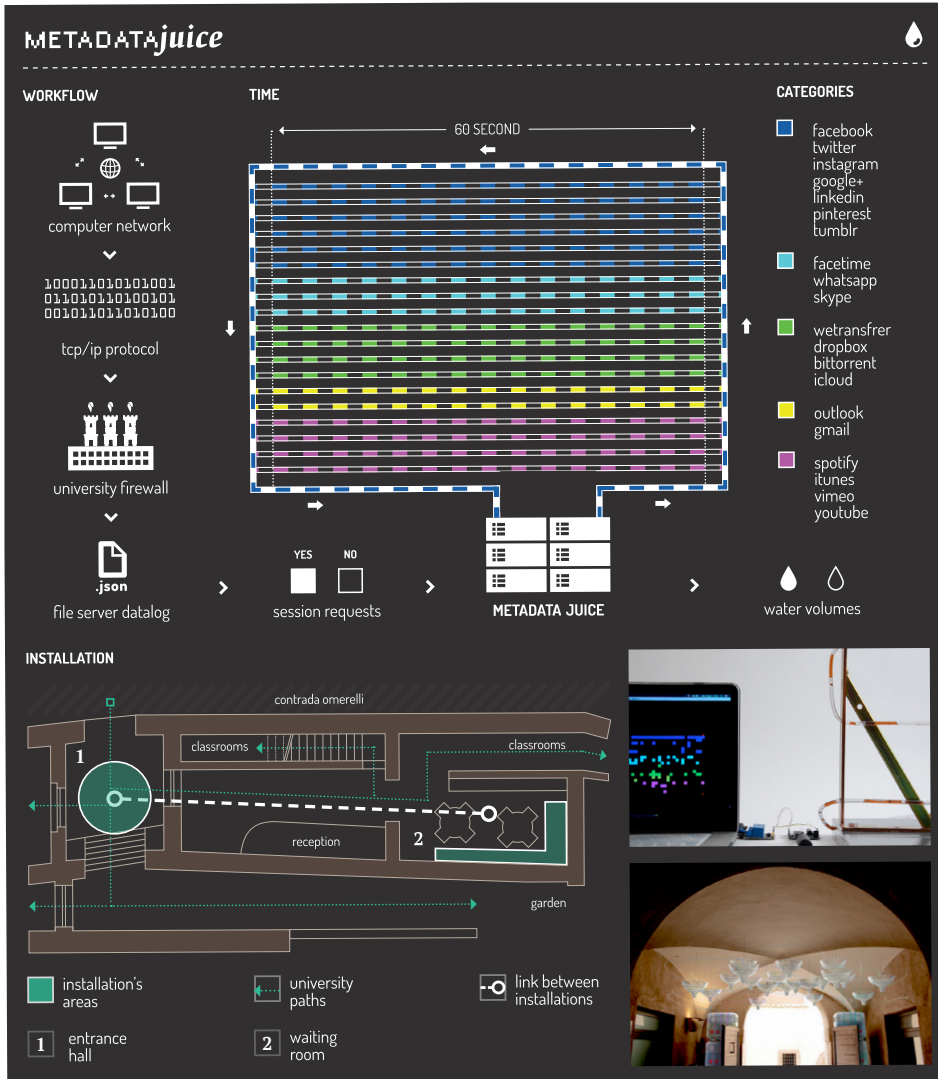
References

Arnall, T., (2013). Making Visible: Mediating the material of emerging technology. *Oslo, Norway: Oslo School of Architecture & Design.*

Cairo, A. (2013). L'arte funzionale. Informatica e visualizzazione delle informazioni. *Torino, Italy: Pearson Italia.*

Fig. 1. *Metadata Juice's working system, placed in the Unirsm's entrance hall. Republic of San Marino.*

Fig. 2. *Vibrancy's working system, data processing and visualization and working prototype. Republic of San Marino.*

VIBRANCY

WORKFLOW

university noise → noise detection → data processing → **VIBRANCY** → visibility increase

INTERACTIVE DATAVIZ

9°/60″   44°/60″   60°/60″   15°/60″   39°/60″   56°/60″   20°/60″

WORKING PROTOTYPE

cover grid
10x10 cm

polycarbonate
column
10x10x60 cm

EPS pearls

fan

noise = 0   noise = n   noise = N

prototype's schematic section, scale 1:10   prototype in action   EPS movement details

LUST, McWilliams, C., Reas, C., (2010). Form+Code in Design, Art, and Architecture*. New York, New York: Princeton Architectural Press.*

Manovich, L. (2010). Software Culture*. Milano, Italy: Edizioni Olivares.*

Simanowski, R., (2011). Digital art and meaning. Reading kinetic poetry, text machines, mapping art and interactive installation*. Minneapolis, Minnesota: University of Minnesota Press.*

Tufte, R.E., (1983). The Visual Display of Quantitative Information*. Chershire, Connecticut: Graphic Press.*