

Re-appropriating Old Furniture via IoT, in an Artistic Context: The Case of “DolceVita”

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Abstract. An old 1950’s buffet was re-appropriated with QR tagging and internet resources, in the context of a design exhibition. This paper describes its concept and IoT realization for a monthly deployment in the AntiDesign2014 venue.

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1 The Case: IoT Re-appropriation of Obsolete Furniture

The project “Dolce-Vita” consists of the re-appropriation of a 1950’s buffet and the modification of objects inside it, using IoT technology and internet resources, in order to augment its function and transform it into an interactive art installation and a mediating device. This paper provides a detailed description of the concept development and the process of implementation of this project.

The old cabinet had become functionally and stylistically obsolete. It originally belonged to the designers’ grandparents and its style was very prominent in the working and middle class households in Greece during the 1950s and early 1960s, but currently this old cabinet had no commercial value and it was not in a very good condition. Yet it had emotional significance for its present owners (designers) for it carried childhood memories, and this was the main reason why the designers decided to give this cabinet a renewed life transforming it into the central piece for the “Dolce Vita” installation. The occasion presented itself in the context of the AntiDesign2014 venue, a month-long exhibition themed: *Proposals for a zero budget era*, at Athens “Technopolis” art and Culture Park. The venue specifically addressed design in times of financial crisis. The design team decided to augment and re-appropriate the old piece of furniture for AntiDesign2014, challenged not only by creatively using recycled objects, but also by observing the perception of well-being during the past decades (as documented in decorative items, lifestyle consumer products, photographic and film material). The resulting overall design, through the use of rituals and iconography, aimed to provoke contemplation related to urban Greek lifestyle and the perception of affluence and comfort.

The installation aimed to invite participants into a conceptual roaming/wandering/stroll through the post-war era of optimism making use of the modified cabinet and the artefacts inside which influence a triptych projection. Both the cabinet itself and the theme of the adhesive tapestry that lines the interior shelves are symbols of the working class aspirations for social rise, affluence, and entering into the glorified realm of bourgeois life; tasting the delights of “good life” of the 1960s–1970s. The pictorial content of the digital photographic triptychs refers to that age of hope in contrast to the current financial crisis and pessimism.

The buffet itself resonated with collective memories to many visitors/users. The projection, although comprising of randomly selected images found in the internet, is constructed by the respective software so as to maintain a very strong aesthetic coherence as a triptych (see Fig. 1). The experience of interaction with *Dolce Vita* oscillates between a set of direct sensory stimuli provided by the old buffet and the plates inside it, and a series of visual and conceptual stimuli effected by the dynamics of the changing projections. The interaction with the *Dolce Vita* buffet refers simultaneously to the experience of the kid that digs into her grandmother’s buffet, to the ritual of serving treats to guests (a typical Greek custom for visitors), but also to the contemporary practice of web searching/browsing with often unexpected results.



Fig. 1. The buffet, its content, and the triptych projection on the wall behind it

QR codes were used as an IoT mediator subtype [1] via which a “*device mediates the interactions between Physical Entities and Digital Proxies*”. The plates from inside the buffet when placed on top, act as a means to select the theme of the triptych projection, which relates each time to the icon on the selected plate. As a result, the buffet obtains a new function: beyond the storage and display of physical objects (dishes, glasses etc.) it allows the storage, seeking and display of digital archive material (for archive interactive art strategy see [2]), and reflection upon the produced associations. An analogous process of reuse and re-signification could be expanded in other obsolete elements of home furniture – bearing similarity with the approach in [3].

2 Design and Interaction

The *Dolce Vita* installation consists of two main visible parts: the augmented buffet and its contents, and a digital projection on the wall behind the buffet. There are design relations and functional links between both the physical and the projected parts of the installation at various levels. Users choose among the thematically coded plates, found inside the buffet, and place them on the tray which is atop the buffet in order to alter the theme of the triptych images projected on the wall behind the buffet. The installation is complemented by simple electronic equipment, several web-accessed photographic collections/archives and a dedicated programme that compiles and manages the projections.

The tripartite structure of the buffet is reflected to the triptych form of the projection, which is following the same visual proportions as the doors and internal divisions of the cabinet. The iconic 1960’s imagery of the inside adhesive tapestry resonates on the crockery found inside the cabinet. The plates are artefacts that one would normally expect to find inside a 1950’s–1960’s urban home cabinet, blending naturally to the style and period of the buffet. Images selected from the adhesive tapestry are imprinted on the plates that have a matching QR code sticker beneath them. The 17 specially decorated plates inside the buffet, when served on top of the tray, alter the theme of the triptych images (drinks, food, horses, gambling, travels, home-décor, etc.), relating directly to the icon of each plate (Figs. 2 and 3).

The buffet is internally lit inviting one to search inside. The custom-made wooden tray on top of the buffet hides a small webcam that reads the QR codes beneath the plates. The tray provides enough space on both sides so one can place and try various plates at the same time. The hidden lights inside the tray enable the reading of the QR codes (beneath each plate) by the webcam, and a luminous transparent circle in the middle serves as visual aid for the targeted placing of the plates.

The associative triptych projection triggers virtual wanderings. For example, the fruit-plate-icon generates still-nature fruit-bowls in (signifiers of affluence) but also Carmen-Miranda playful fruit-hat images. Likewise, the “boat-in-a-bottle” plate generates a triptych with recreational sailing around islands, juxtaposed with miniature sailing boats entrapped into decorative bottles. Photographs selected attempted to relate to and comment on the greek crisis situation or urban lifestyle; thus they included typical decorative items to be encountered in such cabinets. The images compiling the galleries where the projection retrieves its material from are a result of internet image



Fig. 2. Visitors may take a plate from the cabinet and place it on top (on the luminous circle) thus initiating a coherent triptych visual, relating to the dish image. The QR tags at the back of each plate, detected via the webcam and a PC, trigger the projection of related content.



Fig. 3. Each plate is printed with a distinct image extracted from the patterns of the inside tapestry of the buffet; when placed on the top surface (webcam reader) each printed dish represents a theme for images projected behind the cabinet.

search and are used via a Dropbox folder, nevertheless any digitized or archive material can equally well be used as resources.

3 Implementation

As mentioned before, the installation consists of the cabinet (buffet $2.00 \times 0.60 \times 1.00$ m), specially modified plates inside it (17 plates), a simple device (wooden tray with hidden webcam) for recognizing the plates placed on top of the buffet, and a triptych digital projection on the wall behind the buffet (3–4 m distance). A laptop and a digital projector were also used. During the installation these were placed simply in an inconspicuous position on the floor behind the buffet with no effort to hide or disguise them.

The buffet was left untreated and unrepaired. The internal shelves had a plastic adhesive decorative cover with specific images shown in Fig. 5. It was necessary to remove some newer adhesive tapestries that covered the initial tapestry and clean its

surface. LED light strips were attached and hidden beneath the top surface of the buffet in order to light up the interior of the buffet. A small web-cam was attached beneath the centre of the top surface of the buffet facing upwards, and a very small hole (~ 5 mm diameter) was drilled on that surface so that the web-cam can “view” the QR codes of the plates when placed on the tray. The buffet had a drawer in its right compartment which was temporarily removed.

The wooden tray ($74 \times 37 \times 10$ cm) on top of the buffet is made out of 5 mm untreated plywood, and the transparent circular hole in its top surface is 15 cm in diameter and covered with 5 mm clear Perspex. Simple LED light strips are attached inside the wooden tray.

The 17 themed plates are cheap, plain white, glass plates purchased from a local hardware hypermarket. They are 6 fruit plates, 6 dinner plates and 5 soup plates. They were chosen so that they match in style with the plates originally found inside the buffet. Each plate was decorated with an icon selected from the adhesive tapestry of the buffet (Figs. 3 and 5). Those icons were laser printed on decal paper and applied to the top surface of the plates. A small square adhesive with a unique QR code was applied beneath the base of each plate.

Technologies used in this installation were: WPF and QR code recognition. *Triptych* (Triptych.codeplex.com) is the software developed for this occasion and made available as open source, for interactive visual art experiments on the theme of triptych displays. The team used a WPF-based Windows desktop application, which shows a tripartite 1:2:1-sized display using images from a local file folder that are organized in thematic subfolders (including a “Startup” subfolder). By pointing a respective QR code to a webcam, an image subfolder is picked (QR code contains a URL with subfolder’s name). The left and right panes on the Triptych have their leftmost and rightmost halves cropped out of the display respectively (Figs. 1 and 2). Those panes are both using right-to-left (RTL) display option, so that they show the respective image horizontally flipped. Since they’re both assigned to show the same image this results in them showing the left and right halves respectively of the horizontally flipped image. A timer (background thread) picks another image as source for the middle and the left/right panes of the triptych, from a random-ordered list of the images in the currently chosen subfolder. The middle and the left/right images are picked from the same list with a different frequency (time delay), so that different combinations of images (Triptychs) can be achieved in a visually coherent manner, as time passes. Periodically, the same image may be picked for both the middle and the left/right panes on the triptych, unfolding a mirroring, kaleidoscope-like panorama, since the vertical borders between the triptych panes are practically mirroring axes. This effect was inspired from the left and right doors of the tripartite cabinet with 1:2:1 part ratios, that open to respective directions, splitting a view in half and flipping its parts outwards to the left and right sides (Fig. 4). The software run on a recycled screenless laptop, salvaged from trash and hidden under the cabinet.

Using the Cloud: The images folder and the application can be on Dropbox or other Cloud Storage solution that is synchronized to a local folder so that they are easily updated from a remote location. This also facilitates offline updates, even when the installation computer is shut down, so that it catches up with any updates when the

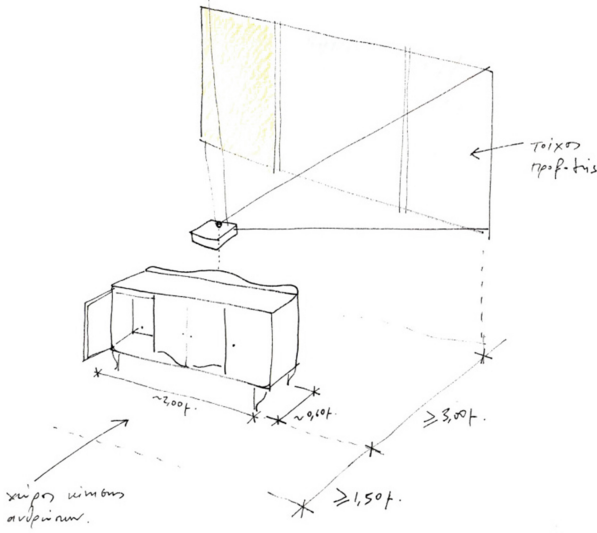


Fig. 4. Sketch of the installation



Fig. 5. Detail of the adhesive tapestry inside the cabinet

system and local cloud storage synchronization agent is restarted. One can have the QR codes contain custom short URLs generated out of shared web links provided by a cloud storage that hosts the image subfolders. For example, Dropbox allows to right-click a subfolder under its local synchronization folder and select to copy a sharing URL to the system clipboard to paste elsewhere and share. Such short URLs can be constructed using services like TinyUrl.com, but also using link tracking ones like Bit.ly. Thus web analytics (statistical info) can be obtained for user visits to the URLs hosted by the respective QR codes (e.g. using a smartphone's camera via a QR reader app). Such URLs apart from being used as tokens to point to a local image

subfolder, can serve as online web galleries displaying the same images of those folders (e.g. Dropbox sharing URLs point to photo galleries on the web for those cloud-shared folders that contain only images).

4 Reception and Use Observations

The DolceVita installation was exposed to the public and used during the course of a month by more than 600 people. Many, primarily female, visitors expressed emotional contemplation, since the exhibit evoked to many childhood memories.

The luminous, open design and the available RFID dishes inside caused many visitors to interact, by ‘serving’ the dishes and causing a related thematic triptych display, exposed a technology fascination and curiosity that was in turn triggered by the interaction. Visitors searched for the seams and the details of the construction elements. Many visitors subsequently reflected on the hybrid nature of the design item and its implications to other obsolete pieces of furniture.

Relatively few of the visitors contemplated on the specific projected images which pointed at the perception of crisis through the filter of urban lifestyle.

Only a handful visited the folder’s url to see the resulting triptychs that were generated from the physical handling of the exhibit.

Many acclaimed artists designers and architects visited and discussed aspects of the installation. On the aesthetic and artistic aspects it seemed that there were no such remarks received, indicating that the exhibit was successful in providing an artistic experience perceived as a unified whole, (in spite of its inherent complexity).

5 Conclusions

This paper presented a process re-appropriating furniture in combination with virtual resources (internet searched photographs, QR codes, cloud shared resources), and re-combining them for artistic and aesthetic contemplation. For the latter, in terms of aesthetics, it is worth to mention the challenge of generation of a coherent visual triptych, when this is composed from preexisting web-searched images – and not a priori made with triptych-views in mind. This challenge was successfully handled by the design of dedicated software that was subsequently released as open source.

A process of augmentation and reuse similar to the one described here can be attempted in other obsolete furniture or decorative objects that can be easily re-appropriated via widely available IoT resources. It is a process affordable and quick to implement, laying the challenge in people’s artistic creativity and design imagination.

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References

1. Serbanati, A., Medaglia, C.M., Ceipidor, U.B.: Building blocks of the internet of things state of the art and beyond. In: Turcu, C. (ed.) *Deploying RFID-Challenges Solutions and Open Issues*. InTech, Rijeka (2011)
2. Kluszczynski, R.W.: Strategies of interactive art. *J. Aesthet. Cult.* **2**, 1–27 (2010)
3. van den Hoven, E.: A future-proof past: designing for remembering experiences. *Mem. Stud.* **7**(3), 373–387 (2014)