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DESIGN TO IMPROVE THE MODERN URBAN SPACES

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Abstract: *The urban spaces need to be improved both functionally, and aesthetically. In the context of modern architectural tendencies oriented to improving the human relationship with nature, town planners and designers are striving to create more places where citizens can relax and spend few moments in nature, enjoying, besides some fresh air, a nice surroundings with an adequate aesthetics. The paper presents the process of designing some outdoor furniture, specifically a drinking water fountain. The presence of water in the build environment is welcomed. Drinking water fountains can fulfil both the aspiration for a better, cleaner environment and can satisfy a fundamental human necessity of everyday hydrating.*

Key words: *urban spaces, water fountain, contemporary design.*

1. Introduction

Cities and their inhabitants need beautiful, fresh, and vivid urban spaces. Visual and aesthetic attractions are themselves an impressive element in designing urban spaces, appearance, the way in which they are percept and understood by locals or visitors are an important factor for designers and architects. By creatively placing forms, organizing spaces, and improving skeletal elements of cities, urban design attempts to serve citizens effectively. How to design and beautify urban spaces may have different social, economic, cultural, or political impacts. By attracting tourists, intercity beautiful spaces enhance sense of national and local pride, identity, vivacity, security, and effective economic returns.

With the continuous expansion of urban zones, the demand for community beautification projects and environmental concerns has increased to a rate hard to keep up to. A pleasant community appearance adds to home values, helps attract business investment, and just improves the neighbourhood reputation. Research shows that beauty is one of the top three factors in creating community attachment to a particular town or city. It is really helpful to understand some urban design principles to introduce vibrant creative art into otherwise dull urban spaces.

In Romania, the interest for creating a functional, yet attractive built environment was diminishing as the society was heading to the peak of the communist era. This situation led to the still existing dull and impersonal rows of buildings, in a total absence of an urbanistic vision. The buildings were erected without leaving any "green" spaces between for trees, flowers,

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or grass. Therefore, areas where people could walk, sit on a bench, and enjoy a breath of fresh air were just a few.

The aspect to be analyzed as follows is the organizing of public places for relaxation, used by the people to spend a few moments out door, in open spaces. Part of this environment, furniture and other outdoor objects will be assessed and proposals for new designs will be formulated [4].

2. Design Requirements. Objectives

Benches, trash bins, lighting columns, are usually included in the category of urban furniture. They all should be designed to create a friendly and comfortable (functionally and visual) environment. A unitary, organic design is required, in perfect harmony with the architectural style(s) and with the idea of functional urban space.

For the following analyze we choose the *drinking fountain* or *drinking water fountain.* This choice was determined by a less interest given to this object caused by a number of factors. It is a useful object which unfortunately almost disappeared from the present Romanian cityscape, the traditional source of water being replaced by bottled water, considered "safer".

Drinking fountains should provide fresh potable water to all the people walking by. The numerous restrictions related to the product good functioning, therefore to its design, make from it quite a difficult process.

The drinking fountain should be connected to the city water supply network. The water provided by this, should be 100% drinkable. To fulfil this condition, both the water source and the pipelines should be secured and in very good condition. The water quality should also be ensured through design by excluding the physical contact between humans and the fountain/water nozzle to avoid transmitting the numerous diseases.

Then, the drinking fountain should not become a source of water wasting as water has become a scarce resource. So, the fountain should provide water only "on request". On the other hand, the quality of water might decrease as it lays inside the fountain for a longer period (night, for example), at high temperatures in summer. Also, the water might freeze in winter, if it doesn't run.

The soundness of the service provided involves a serious process of research including the assessing of some similar products and establishing a complex *List of requirements,* as a result of this analysis [3].

The main objective of this paper is designing and developing a modern drinking water fountain placed outdoors (or indoors) that provides passing citizens with clean water and aesthetically contributes to improving the sight. The main requirements targeted for this water fountain should be [3]:

- **Aesthetic aspect**: The water fountain should be interesting for the viewers, in perfect harmony with the environment; it should be attractive to observe and its function clearly suggested.
- **Water flow observation:** Though this is a design feature too, the water fountain's structure might allow the viewer to observe its water flow (drainage) with the help of transparent pipes. This will give the analogy with a water spring, hence the idea of freshness could be suggested.
- **Accessibility:** The water fountain should be designed with an accent on accessibility; it must provide water at different heights, according to all the users' anthropometric dimensions, including people with disabilities, or animals/pets.
- **Hygiene:** This is one of the most important aspects of this product as the fountain must always provide fresh clean

water; therefore the materials should be carefully chosen.

- **Low maintenance:** The object should be simple, both as design and production. It might require some level of maintenance, but the construction should provide a good level of reliability. The materials should fulfil all the specific requirements.
- **Easy to install:** The fountain is light and easy to install, provided with standardized connectors both for water network and foundation.
- **Production costs:** The fountain design should require easy obtaining materials, conventional manufacturing processes, and easy assembly.

Sources of water are inherently valuable. Especially in a city, sealed in concrete, water connects us with nature, engages our senses, and physically connects us with the places. Free water sources placed in public spaces, historically provided by philanthropists or cities themselves, were one of the major progressive steps forward in the history of human civilization.

3. Design Sources. Semiotics

Living in modern cities, sealed in concrete, water connects people with nature, engages the senses, and physically connects them with place, creating a bridge towards nature. Free water sources in public spaces, historically provided by philanthropists or cities themselves, were one of the major progressive steps forward for human civilization.

Usually, the design process starts with the idea searching, based on a deep research activity. The existing similar products are evaluated considering the social, historical, cultural, and technological factors. Traditionally, the drinking water fountains are included into a complex construction in harmony with the architectural styles of the times they were build. As the cities are growing, the number of necessary drinking water fountains increased and, consequently the complexity of the construction is diminished.

Therefore, the dimension was no longer the eye catching characteristic, the object's attraction being fulfilled by other elements (Figure 1). The object shapes, colours, textures, the unity of the composition and its quality to "match" the environment are some of the most appreciated characteristics of the modern drinking fountains. All these characteristics are part of the message that such an object should communicate to the people passing by. The object should

Fig. 1. *Drinking water suppliers over time* [7], [8]

transmit to the people a complex message in a simple way, including the object function in the context of an open space, or maybe indoors.

In the context of communication, the study of semiotics is essential for the design process. The solution finding is oriented towards designing an object able to communicate a simple and coherent message.

3.1. Water Semiotics

The symbolism of *water* has a universal undertone of purity and fertility. Symbolically, it is often viewed as the source of life itself as we see evidence in countless creation myths in which life emerges from primordial waters.

We, humans, are all made of water, and so we can liken many of these myths and allegories to our own existence (the macrocosm mirroring the microcosm and vice-versa). Hence, the design should incorporate symbolism of circulation, life, cohesion, and birth by associating the creative waters of the earth with the fluids found in the human body (e.g. blood).

In Taoist tradition, water is considered an aspect of wisdom. The ancient Greeks understood the power of transition water holds. From liquid, to solid, to vapour - water is usually used as symbol for *metamorphosis* and *philosophical recycling* [2]. Among the native North Americans, water was considered a valuable commodity (particularly in the more arid plains and western regions) and thus they considered water to be a symbol of life (further solidifying the symbol affixed in many creation myths) [2].

3.2. Tree of Life Semiotics

The concept of a **tree of life** has been used in biology, religion, philosophy, and mythology. A tree of life is a common motif in various world theologies, mythologies, and philosophies. It alludes to the interconnection of all forms of life on our planet and serves as a metaphor for common descent in the evolutionary sense. The term *tree of life* may also be used as a synonym for *sacred tree* [2], [6].

The *Mayan* believed heaven is a wonderful, magical place on Earth. Heaven, Earth, and Underworld were connected by the *"world tree"*. *Assyrians* substituted the tree with coiled snakes circling around the wood of the wand. The snake is symbolising an underworld consciousness, passing through earth, climbing a stick, transcends to a winged reality, a heavenly creature. Wings on a wand became a symbol of *transformation* and *transcendence* [6]. In modern representations, a *Tree of Life* in various religious interpretations, within myths, and as a mystical concept represents the interconnectedness of all life on our beautiful planet. The Tree of Life connects all forms of creation. The Tree of Life is considered to be the symbol of "Creator".

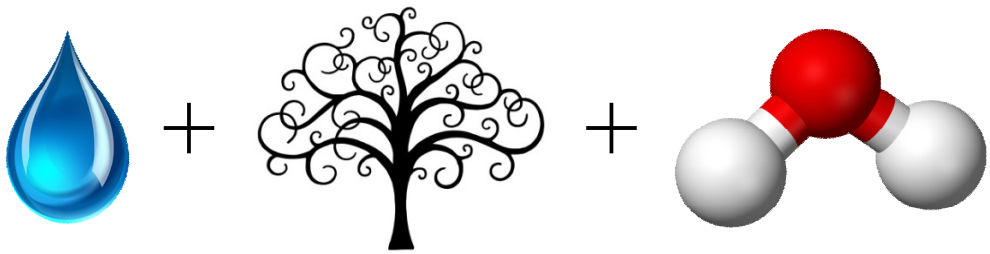


Fig. 2. *Semiotics Study Results*

3.3. Water Molecule Association

Water is the most abundant molecule on Earth. Approximately *70%* of the Earth's surface is water. Water is also the only substance on Earth which naturally occurs in a solid, liquid and gas form. Its chemical formula, **H_2O**, is probably the most well-known of all chemical formulas. One molecule of water is comprised of two atoms of hydrogen and one atom of oxygen bonded together.

With the previous subchapters taken into consideration, we have made a clear analysis of what water means in the past and present cultures. The tree of life is a true symbol of existence, and combined with water, we can probably assume it represents the essence of life itself.

Thus, the study of semiotics can give us clear hints of what our product should look like in shape, color and symbolism (Figure 2). So comes the idea of shaping the drinking fountain according to the water formula and build it as a modular structure, like a tree.

4. Constructive Design

One important part of the design activity is producing graphic representations/ sketches for all the ideas and solutions appeared as result of the creative part of the process. The sketch reveals the idea for the drinking water fountain build as a tree shape, from three modules, each shaped as a water molecule (Figure 3). The oxygen and hydrogen atoms are spheres of different dimensions, the hydrogen will be smaller, and the oxygen will be larger. The difference between the two will be slightly noticeable, but existent, to create a vivid contrast. This contrast will be increased by using different colours for each atom. The product might not be chemically accurate, but will be easy to understand and create an instant connection with the source of inspiration. The final construction will be able to transmit the right message to the viewer, as a unity composition, according to the symbolic meaning of each component.

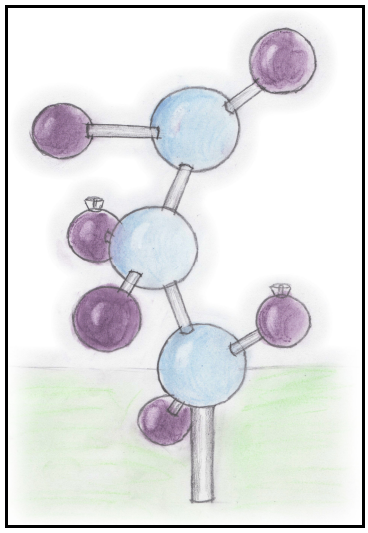


Fig. 3. *Hand Sketch of the Drinking Water*

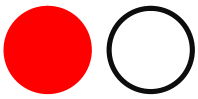
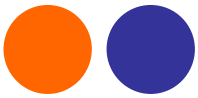
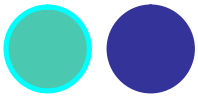
The spheres/atoms will be connected one to each other with pipes at different angles, to create an abstract minimalist design.

The construction will include at least two drinking nozzles at different heights to accommodate different categories of users. One of them will be placed higher for regular adults and the other one will be at a lower height to serve children and disabled people (in wheelchairs). An additional one might be added lower, for animals.

4.1. Chromatics

Choosing the right combination of colours for a product is a complex job for designers because each colour has its own meaning, and certainly a different psychological effect. The meaning of colours can vary depending on *culture* and *circumstances*. Color can influence humans' emotions, actions and how they react to other people, things and ideas.

Chromatic schemes. Semiotics Table 1

	This combination has the purity of **white** which resembles cleanliness, sterile nature and the vibrant energy emanated by the **red** color. It is also the general representation of the water molecule (red - oxygen, white - hydrogen)
	Optimism and intuition expressed by **orange** and **indigo** is a true symbol of development, perfect for a thriving city environment.
	Combining the feeling of being sociable and friendly that **turquoise** symbolizes with the hope and self-achieving idealism that **indigo** expresses, creates a true structure of gathering for passing people to socialize and refresh the body and mind.

Considering the meanings and in order to express the correct message towards passing people who stop by the drinking fountain, Table 1 presents the variants of colour combinations as a design solution. The preferred combination would be that of turquoise and indigo.

4.2. Materials

Choice of materials is generally a difficult problem designers must solve. For the drinking fountain the constrictions related to materials are determined by fulfilling two important requirements: a self-supporting structure and ensuring the water quality.

Fig. 4. *Health hazard in drinking water*

As concerns the water quality, all the component involved in bringing the water from the network to the customer should be fabricated using safe and sound materials and processes.

Not respecting entirely the design specifications might result in poor solutions that can not provide water of best quality (Figure 4) and might degrade in time. Consequently, being unsecure, objects loose people interest and become not functional, eventually transforming into visual garbage (Figure 5), and a source of health hazards.

Fig. 5. *Out of order drinking fountain*

Constructively, the structure of the drinking fountain should be metallic, self supporting, and resisting the exterior and interior stresses. It should be also functional and deliver the water from the city network to the nozzles. Consequently, the structure is tubiform, build from stainless steel pipes and spherical connectors. Stainless steel is a non-corrosive material neutral to water, keeping it chemically unchanged [1].

Outside, each steel pipe is "covered" with a second layer, a transparent PMMA (Poly-methylmethacrylate) pipe (Figure 6). These pipes drain the water back from the small spheres and from the nozzles to the sewage.

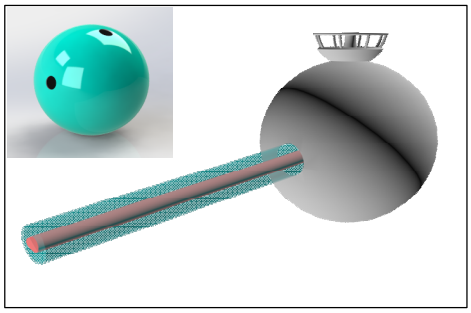


Fig. 6. *Stainless steel and PMMA pipes connected to the sphere with nozzle*

PMMA, known as Acrylic plastic, is a transparent thermoplastic with outstanding strength, stiffness, and optical clarity; it has good Ultra Violet resistance [1].

Inside the oxygen atoms are situated the connectors between the pipes transporting the water from the network and the pipes carrying it to the nozzles. The spherical stainless steel connectors look like in Figure 7 and connect both the stainless steel pipes (connection type A for "incoming" water) and the PMMA ones (connection type B for draining the unused water). The ABS coloured spheres are not functional (no water inside).

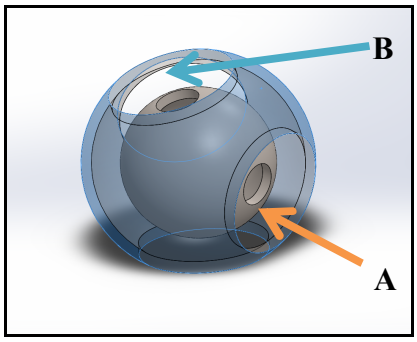


Fig. 7. *The stainless steel interior connector*

4.3. Functional Aesthetics

The design result should fulfil all the requirements, which basically belong to two categories: functional, and aesthetic. The shiny stainless steel inside the PMMA transparent tubes will have an outstanding effect over the passing-by people. Inside the PMMA tubes the running water should give a glimpse of life to this object.

The three types of harmonious combinations of colours complete this good impression, the chromatic variants permitting this object to fit in different environments.

Hopefully, the object complex symbolism could be correctly understood, contributing to the aesthetic appreciation of it.

4.4. Accessibility

The anthropometric and ergonomic study helped designing the product to permit access to the drinking water to all possible users [3], [5]. The overall height of the fountain is about 2.35 m.

The drinking fountain has two drinking nozzles - at 760 mm, and 1400 mm high respectively - that accommodate people of different ages and heights. The first nozzle is for children and people with disabilities (using a wheelchair, for example - see Figure 8). The second is for people having over 1.55 m high. A third nozzle can be set at lower height, to be accessible for animals.

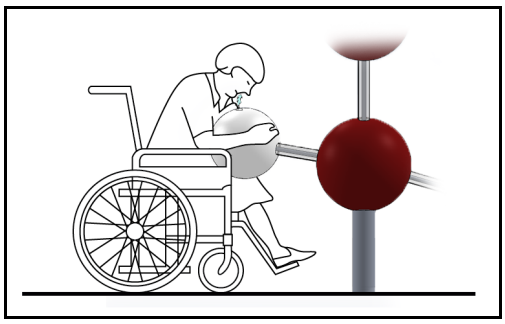


Fig. 8. *Disabled person using the Drinking fountain*

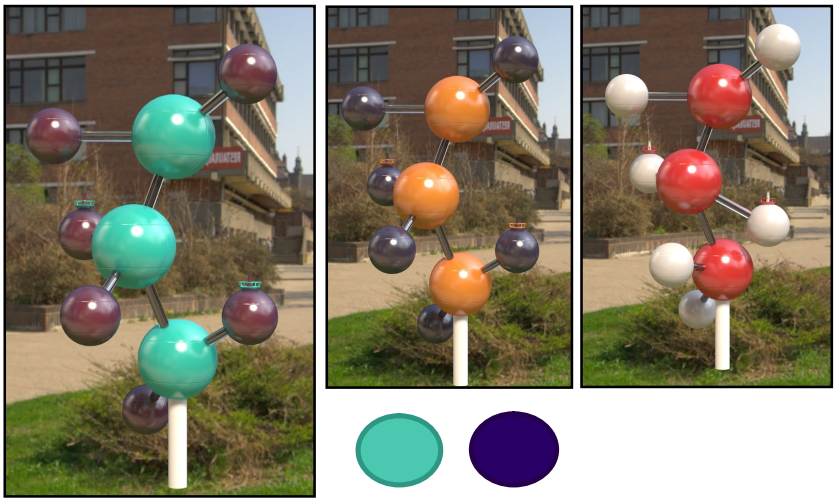


Fig. 9. *Final product rendering. Several chromatic schemes*

The design process ended with a scaled model (1:2) to verify the solution [3]. Several chromatic variants renderings are presented in the below picture (Figure 9).

5. Conclusions

Today, with a new set of health challenges, drinking fountains are still a crucial element of any public space. Water is the healthiest substance people can put into their bodies; free, clean drinking water provided in public places provides an alternative to sugary sodas.

They also reduce dependence on the environmentally degrading plastic bottles for water and sodas, and save peoples' money.

The design objectives are considered fulfilled. A functional model has been produced as a result of the project and in this way the design solutions have been evaluated and verified.

The result is a functional object, designed to provide water to the citizens. It can work connected to the water network or can have an additional pump to get the water delivered with a prescribed pressure (like the model demonstrated). From the design process resulted also an aesthetic object considered a positive visual experience for the viewer.

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