

The Effect of Technology on Outdoor Furniture

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Introduction:

Furniture is an integral and inherent element of architecture, and its design depends a lot on its function and the space in which it will be placed. Therefore, with the technological revolution in all walks of life, and the connection of furniture design with this technology, it was necessary to shed light on the impact of technology in the development of furniture in modern thought, as there are many forms of modern furniture, there are smart furniture of all kinds, whether interactive or multi-use, and the research will review some types of traditional outdoor furniture for gardens, streets and outdoor public places, then define smart furniture and its characteristics by studying some models for outdoor smart furniture.

Definition of the most important terms that will be covered by the research:

▪ **Outdoor Furniture:**

It is the seats, sofas, chairs and tables that are used in open areas such as streets, gardens, parks, and any open place where there is fresh air.

▪ **Environmentally friendly furniture:**

Furniture made of non-toxic, sustainable and renewable materials, or materials that can be recycled. Environmentally friendly furniture is characterized by the following:

- Maintaining air quality, so that no materials are used in its manufacture that result in emissions that affect human health.
- Preserving natural resources from depletion through recycling.
- Using renewable natural resources in its manufacture and being comfortable in its use.
- To be made of materials capable of facing the natural conditions in the environment.
- To withstand the strong heat of the sun and temperature variations.

▪ **Smart Furniture:**

Smart furniture is not modern furniture, but rather ordinary furniture. Computer applications made it possible to re-discover the function that it performs, and gave it another dimension in performance that was not expected to be reached. It is a multi-use furniture where each piece of furniture can perform more than one function, this furniture needs equipment, a special electronic piece that relies in its design on integrating sensors and a data processor in its parts that are linked within central networks. The piece of furniture is no longer just an inanimate

object used by humans automatically according to the inherited concepts, but it has the ability to sense the user and identify him/her, and thus interact with him and adapt to his desires, as it is made of smart materials, and one of the most important features of these materials is the ability to take variable reactions to meet the needs of functional performance. Therefore, smart furniture is in line with the aspirations of the times in its out-of-the-ordinary designs, mostly inspired by transforming digital dimensional technology, significantly there are no limits to its free ideas.

▪ **Solar energy:**

It is the light and heat emanating from the sun that man has exploited since ancient times using a range of technologies that are constantly evolving.

Solar energy is a clean, renewable and environmentally friendly energy whose importance is gradually increasing in the energy market along with other renewable energies whose source is wind and biomass.

Solar energy is produced using photovoltaic technology, which absorbs the sun's heat and turns it into electrical energy using photovoltaic panels.

First: The most important specifications of outdoor furniture:

Finding comfortable and suitable outdoor furniture can mean the difference between spending time enjoying the fresh air and escaping inside after a few minutes, so outdoor furniture must have more than elegant appearance, as outdoor furniture must withstand various weather conditions and provide good value to the user.

When choosing outdoor furniture, the following must be taken into account:

1- Quality:

The outdoor furniture is no less important than the indoor one, as outdoor furniture is exposed to many days of weather fluctuations, which the home furnishing may never be exposed to. Therefore, outdoor furniture must be made of high-quality materials and raw materials, and must withstand natural factors such as sun, rain, dust, and all different weather factors.

2- Comfort:

It must be taken into account that seats are comfortable for the user, whether large or small, man or woman. Therefore, the design of the seats is required to be of appropriate dimensions and according to the dimensions of the human body in order to serve the desired purpose. The width of the comfortable seat is 45: 50 cm, and its height from the ground is 40 cm, pillows should also be soft, comfortable, and light in weight.

3- Suitable for the weather:

The outdoor furniture must be made of durable materials and raw materials, materials that can withstand changing seasons and different weather factors, and also choose fabrics for its cladding, it should be made of materials suitable for all seasons and are usually resistant to the sun and they do not fade quickly, and they are also waterproof, and for this they should be Sustainable fabric that preserves its shape, softness and elegance outdoors.

4- Easy to care:

Outdoor furniture should be made of materials that are easy to care for and clean in a simple and uncomplicated ways.

5- Beauty and elegance:

Outdoor furniture should be comfortable and durable, but it should also look elegant, because elegance and good looks are just as important for comfort and durability.

6- Colors:

When choosing the colors for outdoor furniture, light colors are taken into account for the places most exposed to the sun, because dark colors change color over time and give an unaesthetic form.

7- Environmentally friendly:

One of the basic conditions for considering a product to be environmentally friendly is that its shelf life and life cycle should be long, and this means that designers should tend to patterns that are not linked to time; As it remains attractive to the eye no matter how much time has passed.

8- Security:

The outdoor furniture must be solid and durable, taking into account that its edges are not sharp or pointed in order to protect children and the elderly. Furniture paints should be harmless, and furniture must be made of non-combustible materials to ensure protection and safety for users.

Second: Some types of traditional outdoor furniture:**1- Traditional chairs, sofas and tables:**

Benches are the most commonly used element in outdoor spaces, not only in parks and gardens, but in stadiums, at school festivals, in mosques, in churches, in the streets, at bus stops, and in many other places.

Park benches are used by sitting in the sun in the garden, enjoying a conversation with a friend or reading a book outdoors. Without park benches, the city space would be much poorer and less efficient.

There are many types of seating and they are usually made of wood, metal, stone, plastic or rattan.

Also, in many cases, sofas and tables are made of the same materials as the seats.

Third: Some types of smart outdoor furniture:**1- Seats:**

A. A bench covered with photovoltaic solar panels and equipped with batteries, which is characterized by its perfect size, shape and weather resistance, which allows it to be used in streets, parks and public places. To provide the visitors of these places with free internet service, and to charge various types of devices such as smartphones and computers.

B. The smart public bench designed by Italian furniture maker CITYSI to enrich the modern lifestyle. The seat uses renewable solar energy, and contains four charging ports for electronic devices, two wireless charging stations built inside, multi-colored smart lighting, and the Internet to make it easier to stay connected to the world while you are there, for individuals in a public park or inside a mall or any outdoor space.

C. A smart all-amenity seat for those who want to stop for lunch, relax in the fresh air and enjoy the sun, it is fully solar powered and equipped with 3G/4G technology that allows

smartphone recharging and web browsing thanks to the built-in USB ports and wireless chargers with multiple LED lighting Colors.

D. The smart solar powered seat consists of a wooden seat and a steel structure in the form of a band that wraps around the seat and symbolizes the infinite flow and energy conversion from solar energy to electricity, it is a 100% independent system that works around the clock and in all weather conditions.

2- Smart tables:

A. The Sun Table:

A completely functional table that has a top made of solar cells, which capture and store energy from sunlight. For the purpose of using this solar energy, we only raise the direct current (DC) cover to connect the laptop, smart phone and other equipment, and there is a place to save the mobile, and the table has legs that can be shortened or lengthened as needed, and it is made of metal, and it is resistant to conditions weather, it can be shipped even in partially shaded places.

B. Solar table:

Runs only on solar energy, the solar system built into the roof generates 300 watts and stores this energy in a 100-amp battery, which can then power electrical appliances through four USB ports, and LED overhead lighting, in addition, the tables are equipped with storage capacities in order to accommodate different levels of sunlight throughout the day and then using this energy to charge devices at night, as lighting at night ensures more safety, it is made of galvanized steel, tempered glass, and rustic oak. They are ideal choices for resorts, national parks, rest stations and other locations, it is a comfortable seating area with a unique opportunity to charge a smartphone or other portable devices wirelessly or via USB sockets built into the table.

C. The Current Table:

A workstation that generates energy from daylight and then uses it to charge devices, the table features a clear orange glass top on triangular legs, with two USB charging points that can be used to charge batteries in phones or tablets.

This table with a rooftop solar panel generates electricity to recharge tools using a process similar to photosynthesis. Inside the tabletop glass panels is a solar cell made with a dye that uses the properties of color to generate an electric current, in a similar way to how plants use green chlorophyll to convert sunlight into energy.

This technology works by placing small particles of titanium dioxide on a piece of clear glass that is then dyed orange. The dyeing technology helps the titanium dioxide absorb sunlight more efficiently.

When sunlight is present, the electrons stored in titanium dioxide are released to form an electric current. When not in use, the electricity is stored in a battery.

The table can charge itself using the diffused sunlight found inside, unlike traditional solar cells that require direct sunlight to generate electricity.

3- Smart Umbrellas:

A. Smart sunshade:

A smart solar umbrella is a new, environmentally friendly product. This product takes full advantage of the advantages of solar energy, through the flexible photovoltaic panels installed on top of the solar panels, through which light energy is converted into electrical energy, and then charges mobile phones, etc., and it allows users to more Eco-friendly comfort while lounging on the attached benches allows them to charge their mobile devices and enjoy the shade of the sun.

B. Solar canopy:

Solar-powered canopy, allowing users to gather in the shade on canopy-mounted seats, and charge laptops, phones, e-bikes, and electrical appliances via USB ports or standard electrical outlets, with three solar panels each pumping out 250 watts, and the canopy provides a Wi-Fi workstation and a solar lab for students during the day.

C. Smart Beach Umbrella:

A Greek company managed to invent chargers for mobile phone batteries using open beach umbrellas found in hotels and resorts, where those sitting under the umbrellas can benefit from this service around the clock. These devices that employ solar energy with high efficiency, the new invention of a solar cell phone charger that can be used in places beyond open beaches to include bus and metro stations, public park benches, open markets, and Cornices. The devices have proven their efficiency in charging phone batteries using solar energy with high capacities, and high speed.

D. Sofa with Smart Canopy:

A fixed outdoor solar-powered sofa that contains a USB port for chargers and also contains a light switch for the sofa to control the closing and opening of the lighting, made of stainless steel and rattan, a fabric suitable for external environmental factors, and it consists of a solar panel installed on the top of the sofa canopy.

4- Smart trash containers:

A. Clean Cube:

The Clean CUBE features a solar powered trash compressor that operates automatically based on the bin's filling level, for easy and safe removal of rubbish.

Clean FLEX Wireless Ultrasound Fill Level Sensor:

- The Clean FLEX fill level sensor can be installed in any type of basket, container, or tank. If the container is made of plastic, the device can be fixed by tension. For metal containers, Clean FLEX can be attached to the container lid using brackets.
- The Clean FLEX ultrasonic sensor can detect both solids (general waste, paper, glass, e-waste, textiles, etc.) and liquids (oil, sediment, agricultural products, etc.).

5- outdoor lighting:

External lighting elements, although they are not a type of external furniture, but they are a necessary and important element, especially at night, to show the external furniture and achieve safety for users.

A. Solar outdoor lighting poles:

A smart solar umbrella is a new, environmentally friendly product. This product takes full advantage of solar energy, through the flexible photovoltaic panels installed on top of the solar panels, through which light energy is converted into electrical energy, and then charges mobile phones, etc., and it allows users to eco-friendlier comfort while lounging on the attached benches allows them to charge their mobile devices and enjoy the shade of the sun.

B. Solar flower-shaped light pole:

Solar-powered canopy, allowing users to gather in the shade on canopy-mounted seats, and charge laptops, phones, e-bikes, and electrical appliances via USB ports or standard electrical outlets, with three solar panels each pumping out 250 watts, and the canopy provides a Wi-Fi workstation and a solar lab for students during the day.

C. Solar paths and road lighting lamps:

A Greek company managed to invent chargers for mobile phone batteries using open beach umbrellas found in hotels and resorts, where those sitting under the umbrellas can benefit from this service around the clock. These devices that employ solar energy with high efficiency, the new invention of a solar cell phone charger that can be used in places beyond open beaches to include bus and metro stations, public park benches, open markets, and the Corniche. The devices have proven their efficiency in charging phone batteries using solar energy with high capacities, and high speed.

D. Smart lighting poles for gardens:

A solar-powered lighting unit used in public or private gardens, equipped with three strips capable of polarizing solar rays from three directions, and then converting it into electrical energy. The period of collecting energy from the sun's rays, and it turns off during the night and lights up the lamp.

E. Decorative solar lights:

A fixed outdoor solar-powered sofa that contains a USB port for chargers and also contains a light switch for the sofa to control the closing and opening of the lighting, made of stainless steel and rattan, a fabric suitable for external environmental factors, and it consists of a solar panel installed on the top of the sofa canopy.

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