

Interior and exterior landscaping

The important components of smart design, such as building management systems and the Internet of Things (IoT), offer an effective means of governing interior systems like lighting, temperature, safety, and security. These systems furnish data about the structural units and user behaviours, which can be analyzed to attain more sophisticated integration systems, elevated performances, and more competent interior design solutions. Moreover, building systems that exploit smart interior design solutions possess the capacity to learn and even predict the needs and preferences of the occupants. This capability enhances dynamic processes, improves lifestyle comfort and flexibility, elevates energy efficiency, and mitigates costs, thereby achieving a more sustainable interior design.

PEOPLE are looking for ways to add value, achieve peace of mind, experience quality time, and to escape from the 'rat-race' in their lives. Stated differently, people want to add depth and meaning to their lives. One way to accomplish this, is to surround yourself among plants. Landscaping can make dull and solid areas pleasing to the eyes. It is responsible for transforming ordinary homes into spectacular ones and office buildings into warm, livable spaces. Landscaping is both science and art, and requires good observation and design skills. A good landscaper understands the elements of nature as well as construction and blends them accordingly. Well-planned, healthy, and well-maintained landscaping dramatically enhances the market value of the property. Irrespective of whether the property has a commercial or a residential use, a room that overlooks a beautiful, rich, green landscape usually gets the most takers and is quite conducive commercially. Ornamentals planted indoors or outdoors, not only beautify the place but also gift you with its endless benefits.

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Interior landscaping

Interior landscaping is the practice of designing,

arranging, and caring for living plants in enclosed environments. Interior landscaping is an appropriate term because indoor environments contain plains, angles, and horizons that are softened, accentuated or altered by the addition of plants and planters thus landscaping the interior. Similar to outdoor landscapes, interior landscapes provide spaces with ornament, colour, sculptural elements, focal points, and an overall pleasant environment. In the trade, interior landscaping is also known as plantscaping and interiorscaping. Interior landscaping can be designed in a way to draw the eye beyond the window into the outside world.

Benefits of well-designed interior landscaping

- Tropical plants and greenery revitalizes dark corners, bring colour to empty walls, and provide fresh sights, sounds and smells for your business environment.
- *Improved air quality:* Plants produce oxygen and filter out harmful pollutants from the air.
- High quality replica plants brightens dark corners with plants that will always look their best, however low the natural light levels are.
- *Improved mental and physical health:* Interior landscaping



Meditation garden



can contribute to a better working and living environment.

Specialization is needed in selecting plants, containers and accessories to fit the space, lighting and ambience of every office or home to create stunning interior landscapes that will stand the test of time.

Sick building syndrome

As far back as 1984, the World Health Organization published a report which claimed that as many as 30% of new or refurbished buildings caused occupants to suffer symptoms presently known as 'Sick Building Syndrome' - a term used to describe situations when people experience acute ailments and discomfort, which seem to be linked to time spent in a particular building. According to World Watch Institute, more than a billion people (about 20% of all humanity) live in communities that do not meet the air quality standards defined by World Health Organization. Plants have proven to be important life supporters as they remove carbon dioxide from the air and release oxygen through the process of photosynthesis. The NASA studies found that plants also work in a symbiotic relationship to remove air pollutants produced by other plants, people and industry. The NASA studies recommend using 15 to 18 good-sized houseplants in 6 to 8-inch diameter containers to improve air quality in an average 1,800 square foot house.

Indoor plants have proven ability to enhance indoor environment quality, improve workplace efficiency, improve visitor perceptions, reduce dust levels, reduce noise and conserve energy, increase customer spend, filter the air in indoor environment, reduce absenteeism and make your workforce more productive and increase humidity in the workplace.

Roof gardens

A garden always provides a space to relax but the limitation of space in big cities and towns has already set the door for enjoying the beauty at home. It is therefore, the need of the hour to earmark some area on the roof top for raising various plants so as to bring the real magic of nature to your home with some previous planning and thoughts.

A roof garden is any garden on the roof of a building. Besides decorative benefit, roof plantings may provide food, temperature control, hydrological benefits, architectural enhancement, habitats or corridors for wildlife, and recreational opportunities. The practice of cultivating food on the rooftop of buildings is sometimes referred to as rooftop farming. Rooftop farming is usually done using green roof, hydroponics, aeroponics or air-dynaponics systems or container gardens. One needs to make sure that the roof on which the gardening is to be done, should be strong enough to carry the weight of the garden.

Green roofs range from extensive to intensive design types. Extensive designs are mass plantings of low profile/ low maintenance plants. Intensive designs have a greater planting depth that allows for more plant variety and overall aesthetically pleasing environments. Both styles help counter the negative environmental effects of typical impermeable, asphalt roof surfaces by absorbing rainfall water which helps reduce runoff into our sewer systems, cleaning water runoff of pollutants, filtering the air that circulates near your roof and enters your ventilation system thereby cooling the air.

Bonsai

Bonsai is a Japanese art form using miniature trees grown in containers. Bonsai trees are known for their beauty, elegance, and simplicity. They have become a popular choice among interior designers to elevate the aesthetic appeal. They are great for small apartments or offices that need a bit of a green touch but do not have much room for plants. Plants adopted for extreme dwarfing like juniper, pine, maple, cypress are suitable for bonsai culture. In Tropical place like India, the tree species like sapota, brassia, tamarind and *Ficus* spp. etc. are well suited. In order to create a good bonsai, horticultural aspects should be incorporated into the composition by using the principles of design.

Window gardens

Window boxes are just containers attached to the house i.e. a narrow box painted perfectly to match the house trim, abundantly spilling forth ivy, geraniums,



pansies, and petunias. They are easy to plant. Choosing a container and a location is a fine start for window box gardening, but picking the right plants really makes the difference in your growing success. Generally, select a mixture of trailers, compact upright plants that grow tall enough to be seen without blocking the window, filler plants, and bulbs. Some of the best suited plants are seasonal annuals like petunias, pansies, sweet alyssum etc., permanent plants like geraniums, miniature roses, dwarf bulbous plants (cyclamen, daffodils, hyacinth etc.).

Exterior landscaping

Exterior landscaping, is the art of designing and arranging outdoor spaces to create a visually appealing and functional environment. Exterior landscaping enhances the look of any building whether it is acres of landscaped grounds or a few exterior planters or window boxes. It can include plants, hardscapes, outdoor furniture, outdoor sculptures, pods, topiaries, patios, and decking. When designing an exterior landscape, it is important to consider the local climate and environment. There are many ways of beautifying your outdoors *viz* lawns, container planting, vertical gardens, terrace gardens, kitchen gardens, backyard gardens, hanging baskets etc.

Lawns

Lawns are truly known as heart of the garden; they are truly the most attractive feature of any landscape. A well tended, neatly trimmed, well planned and preserved lawn can do wonders, and, has a favourable effect on the economy, environment as well as our lifestyles. A lawn is an area of aesthetic and recreational land planted with grasses or other durable plants. Lawns are a common feature of private gardens, public landscapes and parks in many parts of the world. They are created for aesthetic pleasure, as well as for sports or other outdoor recreational use. Lawns need not be, and have not always been, made up of grasses alone. Other plants for lawn-like usable garden areas are sedges, low herbs and wildflowers, and ground covers that can be walked upon.

A good landscaping with a lush lawn can have economic, environmental and lifestyle benefits. Environmentally, apart from being visually appealing, a good landscaping turf controls soil erosion and prevents nutrients from leaching into the water supply. Along with other plants, turfs also help to enhance the quality of air that we breathe by filtering pollutants and making healthier air available to our lungs.

Container plantings

Patios are ideal for landscaping with container plantings. They are easy to maintain and you can swap the plants to extend the bloom time from spring to the fall. All that is required is that you choose plants that are well suited to your area and give them plenty of room in big pots to thrive. Strategically placed containers can also be used to delineate the different areas on your patio. A pair of urns flanking the walkway leading to the patio marks the entrance and guides visitors where to walk to access the patio. Containers placed at the edges



of the living area or dining area visually separate these spaces making them feel cozy and intimate. Annuals are the perfect choice for patio containers. They are long bloomers providing colour throughout the growing season. Perennials also work well in containers. They, if taken care of, will return year-after-year to provide seasonal blooms during the growing season.

Living walls

The concept of vertical garden was started by a Frenchman named Patrick Blanc in 1988. It is an environment-friendly approach to improve the air quality, aesthetics of concrete structures, save horizontal space, conserve energy by insulating buildings, and adjust humidity, etc. As the name suggests, the vertical garden offers a vertical greenery growing both indoors and outdoors. Simply put, vertical gardens are living walls which are covered with fauna or vegetation (anything from grass to plants or herbs and even vegetables). The wall, as growing carrier of greenery, is covered with a hydrophilic substance and filled with light-weight growth media that is a combination of organic and inorganic material, but hardly any soil.

Vertical gardens not only look great but they are extremely good for the environment, especially when they are installed in built up urban areas. Vertical gardens are also referred as green wall, living wall or bio walls. A green wall is a wall, either free-standing or part of a building that is partially or completely covered with vegetation and, in some cases, soil or an inorganic growing medium. Extending the plants or greenery onto the building façade has shown potential in improving air quality and reducing surface temperature in the built environment. The breathing wall with vegetated façade aims to transform the building as an ecologically complex and stable plant, microbial and human community that helps to improve the air quality in an interface between natural processes and the building's structure environmental system.



Living wall

Hanging baskets

Hanging baskets with trailing or cascading plants are suited for indoors as well as outdoors. These baskets make a big difference to the look and feel of your premises. These can be hung at the entrance of the house or can be placed in the hall or drawing room beside a well-lit window. These decorate kitchen walls. Apart from doors, hanging baskets can be suspended from trees, electric poles, fences etc. Hanging baskets are suitable for the all seasons. Whether planted for summer or winter interest, hanging baskets provide valuable colour at eye level. Choose vibrant bedding plants for a short-term show or herbs, shrubs and evergreens for a long-lasting display. Ornamentals like petunias, pansies, ivy, salvia, pelargonium, geraniums etc. look wonderful in hanging baskets.

Standing baskets

Standing baskets are a new addition to exterior planting range. They offer the perfect solution for areas in the garden and grounds that are unable to support wall hanging baskets. Standing baskets can be placed almost anywhere, and can be used as an addition to your external planting theme, giving the premises extra colour and bloom whilst complementing the existing hanging basket arrangements.

Kitchen garden

The traditional kitchen garden, also known as a *potager*, is a space separate from the rest of the residential garden – the ornamental plants and lawn areas. The kitchen garden may serve as the central feature of an ornamental, all-season landscape, or it may be little more than a humble vegetable plot. It is a source of herbs, vegetables and fruits, but it is often also a structured garden space with a design based on repetitive geometric patterns. The kitchen garden has year-round visual appeal and can incorporate permanent perennials or woody shrub plantings around (or among) the annuals.

A well-designed potager can provide food, as well as cut flowers and herbs for the home with very little maintenance.

Kitchen gardening can inspire you to take an interest in the origins of your food and make better choices about what you put on your plate. When you grow your own food, you savour it more because of the effort it took to get to the table. Growing your own food has many health benefits such as it helps you grow more fresh fruits and vegetables, you decide what kinds of fertilizers and pesticides come in contact with your food and you control when to harvest your food. Vegetables that ripen in the garden have more nutrients than some store-bought vegetables that must be picked early.

Herb garden

The herb garden is often a separate space in the garden, devoted to growing a specific group of plants known as herbs. Herb gardens may be purely functional or may include a blend of functional and ornamental plants. The herbs are usually used to flavour food in cooking, though they may also be used in other ways, such as discouraging pests, providing pleasant scents, or serving medicinal purposes (such as a physic garden), among others. Herbs often have multiple uses. For example, mint may be used for cooking, tea, and pest control. Some examples of herbs and their uses:

- *Annual culinary herbs:* basil, dill, summer savory
- *Perennial culinary herbs:* mint, rosemary, thyme, tarragon
- *Herbs used for potpourri:* lavender, lemon verbena
- *Herbs used for tea:* mint, lemon verbena, chamomile, bergamot, hibiscus
- *Herbs used for other purposes:* stevia for sweetening, feverfew for pest control in the garden.

Meditation gardens

A meditation garden can be an escape from the stress of real life, no matter if you are in the city or in a pastoral setting. Meditation gardens can take many different forms, but their primary purpose is to provide a beautiful and therapeutic place for relaxation, rejuvenation, and meditation. Designing a meditation garden can also be a therapeutic process, as you determine what aspects of a garden will be most helpful for you. The plants you choose can be scented, flowering, herbal, tropical, native or even desert style. The most important thing is that the plants should evoke calmness in you.



Ornamental water feature

Water features are a must-have for any perfect garden. Flowing water injects the element of sound into our design - an element that we do not get much of from plants, unless the wind is rustling their leaves. The gurgling sound from a water feature will soothe our frayed nerves when we pull into the driveway after a hard day at work. Build a small waterfall if you desire the natural look. For fountains, there are all sorts of styles to choose from. Although a water garden's primary focus is on plants (eg. lotus), they will sometimes also house ornamental fish, in which case, the feature will be a fish pond.

Privacy fencing

One of the hallmarks of effective backyard landscaping is the provision for adequate privacy. Privacy screening is essential for any private garden. It is a nice complement to a swimming pool or outdoor dining area, as well. Privacy screens can assume a number of different forms. Plants can also be used for screening. Using bamboo plants is especially appropriate for a meditation garden with a tropical theme. But any tall hedge can be just as effective. Homeowners often choose evergreen shrubs for privacy, since they will provide screening year-round.

Smart technologies in interior design

Since the early 1980s, numerous organizations have attempted to articulate a definition for 'smart' buildings. The concept of smart buildings was first proposed in 1981 by United Technology Building Systems Corporation (UTBS) and materialized into reality in 1983 with the unveiling of the City Place Building in Hartford, Connecticut, USA. These developments have impelled interior designers to devise harmonious design concepts that can integrate smart systems. This trend has been fueled by an increase in smart materials, smart devices, and sensors, as well as the expansion of internet connectivity and applications. Consequently, smart buildings are designed to accommodate adjustments for the convenience of occupants, manage resource consumption, and study occupants' behavioural patterns. The Intelligent Buildings Institute originally defined a smart building as a structure that fosters a productive and cost-efficient environment by optimizing four fundamental elements *viz.*, structure, systems, services, and management, as well as the interplay between them, to cater to the occupants' needs with a focus on technological solutions.

Effectiveness of smart technologies in interior design

The effectiveness of smart interior design can be assessed based on integration, communication, adaptability, and control. Successful integration of smart interior design solutions with the many design components can lead to improved performance, simplified operation, and a reduction in utility consumption throughout the design's lifespan. Facilitation of robust communication including person-to-person, person-to-machine, and machine-to-machine communication, must be facilitated within the interior environment. Additionally, the design should have the ability to effortlessly adjust to alterations within the space and to be sufficiently flexible



Ornamental Water Feature

to accommodate the requirements of new technology. Smart interior design should embody control over building systems. This control enables the optimization of energy use while providing real time and historical views of occupant behavioural patterns. The incorporation of smart materials and furnishings, along with intelligent lighting and acoustic solutions, allows occupants to adapt to the interior design theme more easily, thereby enhancing their comfort and satisfaction.

With the advent of IoT technology, designers are increasingly embedding IoT sensors within interior structures to collect data on movement, heat, light, and space utilization. The integration of the application of IoT and Artificial Intelligence (AI) technologies in interior design, IoT components embedded in furniture and appliances, provide essential data for AI systems to assist in creating a relaxing and productive living environment.

CONCLUSION

Smart interior and exterior design has the potential to promote highly efficient spaces while significantly minimizing operating costs through accurate monitoring and intensive control of resource consumption, as well as facilitating renewable energy usage. Smart technologies in interior design can transform spaces into highly efficient, flexible, and personalized environments. The deployment of smart design facilities and systems allows for comprehensive monitoring, control, and data storage across all elements within a building. The generated data, when interpreted correctly, can offer a wealth of insights into occupants' behaviour patterns, facilitating better space utilization and more efficient resource management. Smart design solutions enrich occupants' comfort, safety, security, and sensory stimulation, as well as improve the overall health of interior environments. Managing and maintaining a landscaping does contribute to a healthier lifestyle. Apart from innumerable environmental benefits, plants create healthier homes and office environments.

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