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CITY  
RESILIENCE  
2020

**International Conference**

# **THE PATH TO CITY RESILIENCE**

**Edited By: Dr. Zeinab Feisal and Dr. Nihal Amer**

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October University for Modern Sciences and Arts  
Faculty of Engineering, Architecture Department

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# THE PATH TO CITY RESILIENCE

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Edited by Dr. Zeinab Feisal and Dr. Nihal Amer

CONFERENCE PROCEEDINGS

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# THE PATH TO CITY RESILIENCE

International Conference

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## **INTRODUCTION**

All cities are vulnerable to severe impacts from a range of shocks and stresses that can be both natural and human made. Resilience challenges could be a result of rapid urbanization, climate change, political or economical instability. Resilience is the ability of urban systems to maintain continuity through all pressures and strains while positively adapting and transforming towards sustainability. A resilient city assesses, plans and acts to prepare to absorb, respond to and recover from all hazards, either sudden or slow-onset, expected or unexpected while maintaining its essential functions, structures and identity and adapting to continual changes. Consequently, resilient cities have the ability to protect and enhance people's lives, secure development gains, foster an investible environment, and drive positive change. Unplanned cities are more vulnerable to shock as they often have pre-existing stresses. In cities that are not prepared or unable to recover, shocks can intensify existing stresses and create a flow of negative impact that compromise city functionality and put people at risk. The fundamental aspect is how cities should protect their cultural and natural heritage to adapt to climate change without losing their identity.

## **CONFERENCE PURPOSE**

This conference will be a chance to find new solutions and innovations in the resilient urban systems. These creative inventions can be a motive to dynamic, desirable and healthy communities. "The Path to City Resilience" conference is a fertile ground for architects, engineers, city planners, social and political scientists who able to consider new concepts and adapt them according to technological innovations and human desires.

## CONFERENCE THEMES

### 1. Urban Resilience:

Urban resilience is the measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability. Cities and city inhabitants are facing additional challenges as a result of rapid urbanization, a changing climate and political instability. A resilient city assesses, plans, and acts to prepare for and respond to all hazards; sudden and slow-onset, expected and unexpected. As risks and urban population are increasing, urban resilience has gained greater importance in international development discourse and has emerged as one of the core principles of sustainable urban development in the global development frameworks and targets, including sustainable development goals, new urban agenda and agreements on climate change. It is essential to consider the following aspects:

- Pathways towards implementing resilience.
- Innovation in the realm of urban resilience. New challenges require new solutions. How innovations in the resilient urban systems can be a motive to dynamic, desirable and healthy communities.
- Building cohesive, healthy and resilient community.

### 2. Resilience Planning

Resilience planning is a holistic approach that takes into consideration future economic, social and environmental developments including climate change. Planning for resilience empowers diverse stakeholders to evaluate plans, set strategic policies, and implement projects that will enable communities to adapt and succeed when faced with challenges. Resiliency planning can include the following:

- Updating land use codes, zoning, development standards, incentive programs, and other plans or policies to better prepare for shocks and stresses
- Developing measures that allow for action in the face of uncertainty or unexpected events.



### 3. Resilience and Heritage

Historic cities, monuments, archaeological sites, museums and cultural landscapes are increasingly affected by threats both natural and manmade. The progressive loss of these places as a result of floods, mudslides, fire, earthquakes, civil unrest has become a major concern.

- Heritage contributes to social cohesion, sustainable development and psychological well being. Protecting heritage promotes resilience. There is a considerable wealth of experience exists in protecting heritage from disasters and in harnessing the potential of a well-maintained historic environment to strengthen the resilience of communities.
- The initiative and commitment of national and local governments, businesses and communities around the world is increasingly apparent. Their efforts need to be further encouraged. UN Agencies, NGO's and a wide range of universities and technical institutions have been organizing additional support and guidance. Nevertheless, efforts to protect heritage from disaster risk remain fragmented and efforts to draw on heritage as an instrument for building resilience remain inconsistent.
- It is essential for cities to protect their cultural and natural heritage to adapt to climate change without losing their identity.

### 4. Environmental Resilience

Climate change is aggravating the intensity and frequency of natural disasters worldwide. It is crucial to consider the following aspects:

- How cities should be ready to cope with environmental risks.
- Examining the ability of natural systems to recover from disturbances and to tolerate or adapt to changing climate.
- Improving our understanding of the risks facing both natural and managed systems as a result of global change factors, such as climate change, land-use change and nutrient pollution.

## 5. Landscape Resilience

Landscape resilience is the ability of a landscape to sustain desired ecological functions, healthy natural biodiversity, and critical landscape processes over time, under changing conditions, and despite multiple stressors and uncertainties. Landscape resilience identifies the factors that create options and alternative for species and processes within places places. The attributes of resilience differ depending on whether the focus is on species and ecosystems or on enduring physical landscape. It is essential to explore the following:

- The factors that allow a landscape and a geophysical setting to sustain ecological function and maintain a diverse array of species places as the climate changes. Those places with inherent properties that built resilience will be natural strongholds for species and nature into the future.
- The seven main principles of landscape resilience are setting, process, connectivity, diversity and complexity, redundancy, scale and people.

## 6. Infrastructure Resilience

Infrastructure systems are important when considering infrastructure resilience. Resilience is not just related to individual infrastructure elements, but it shows how these work together as energy, transport, water and sanitation, ITC networks – and affect each other.

- Climate Change:
  - Understanding climate change implications for infrastructure resilience.
  - Best practices in infrastructure resilience and enhancing capacity.
  - Critical consideration of the role of planning in resilience.
- Emergency Planning:
  - Understanding acute events and their implications for infrastructure resilience.
  - Understanding emergency planning's role in infrastructure resilience.
  - Best practices in emergency planning.
- Hard Infrastructure:
  - Understanding the fundamentals of infrastructure resilience.
  - Best practices in infrastructure resilience and enhancing capacity.

- Critical consideration of the role of planning in resilience.
- Natural areas and cities.
- Soft Infrastructure:
- Understanding the fundamentals of infrastructure resilience.

## **7. Resilience in Systems**

System resilience is an ability of the system to withstand a major disruption within acceptable degradation parameters and to recover within an acceptable time. It is vital to consider the following aspects:

- Innovative methodologies and smart technologies.
- Techniques and solutions to resilience challenges.

## **8. Innovative Smart Technologies and Resilience**

Innovative applications of smart technologies make cities stronger fostering the following aspects:

- Improving resources allocation.
- Strengthening communication and social cohesion.
- Generally making life easier for everyone living in the city.

## **9. Resilience in Education System**

Resilience matters in education because learning and education can be the vehicle to overcome shocks and stresses. Education resilience involves the following aspects:

- Identifying risks and assets.
- Protecting the assets in schools, universities and communities.
- Aligning education system commitment to a resilience approach.

## **10. National Policy Frameworks on Resilience**

Collaboration with other levels of government is one of the key drivers to ensure a coherent and integrated approach to resilience. Many national governments have plans for reinforcing their countries' resilience establishing national policy frameworks on resilience.

- The role of cities or subnational governments for building national resilience in the national policy frameworks on resilience is crucial.
- This clarifies the importance of local actions for resilience by emphasizing that local authorities are primarily responsible for building resilience.
- Some frameworks on resilience include very specific roles and missions for cities.

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# English Abstracts

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## The Econometric Impacts of LEED Certified Building

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Human bad behavior and their un-consciousness of the environmental impacts during burning the fossil fuel which can support the global warming to be on spot, especially after the Amazon forest and Lebanon crisis, that can help in increase the deforestation and the unbalanced of Co2 emissions for nowadays. The eight principles of green architecture have been characterized in Sustainable Rating System Tools to be categorized in Energy and Atmosphere category, Water Efficiency category, etc. Indoor Environmental Quality is one of the main LEED`s category, helps to improve the indoor spaces efficiency of their light intensity, acoustic performance, and air quality. During design stages, architect play an important role in skin façade design to be more romantic and magnified for achieving the LEED credit requirements, the paper is examining two consequently credits “Quality View” and “Daylight” in LEED V4 BD+C. Rhinoceros software with the cooperation of LadyBug and HoneyBee plug-in both are used to calculate the total energy consumption using Energy Plus engine and measure the direct line of sight to the outdoors through indoor spaces and the situation of daylight in various conditions which including; ASE1000,250 and sDA300/50% metrics for each case study of the four rooms. The results show that for achieving the “Quality View” credit the windows area and energy consumption for heating and cooling are approximately tripled, that is not all, the natural light is exceeded the permissible level of light intensity that can cause glare and uncomfortable for building users during operation time.

**Keywords:** Daylight Autonomy, Quality View, Indoor Environmental Quality, light intensity, Energy Consumption

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# "The Influence of Building Envelope Color and Texture on Energy-Efficiency in Hot-Desert Climate: "A Study for Housing in Cairo, Egypt"

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Climate change has an immense impact on cities that needed to be resilient in response to the global warming effect. Buildings play a key role in the concept of resilience policies and at the same time, responsible for handling human thermal comfort. Considering that the outer surface texture is part of the outer envelope, this factor is in need of a study in advance. It has a crucial function in controlling the indoor energy loads and mitigating the urban heat island effect.

This paper aims to study the influence of different parameters of outer surface texture on improving the indoor thermal environment in hot-desert climate housing. As, the impact of surface roughness, color solar absorptance, and plastering groove-cut shading design on the thermal response of heating and cooling loads examined. This paper questions are meant to examine exactly how far proper choices of surface texture can enhance the indoor thermal environment. The analysis based on simulating a tested case of a residential unit using energy simulation software "Design Builder" to calculate values of the yearly heating and cooling energy loads to find the optimal alternative for each parameter.

Results demonstrated that the outer surface texture profile is not a minor factor and it can play a main part in maintaining the energy consumption of housing in hot-desert climate. Changing its parameters can reduce buildings' energy consumption ranging from 13.9% to 22.9% for the north to south orientations. The study proved the role of low solar absorptance value of surface colors support the energy-efficiency of buildings. In addition, the importance of shading presence even in the north orientation intensified the thermal performance of the outer envelope even by grooving-cut the plastering layer.

**Keywords:** Energy-Efficiency, Surface Texture, Roughness, Color, Solar Absorptance

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## **The Impact of Architectural Responsiveness to Achieve Environmental Resilience**

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The building systems will get active in the responsive system process by dominating their consumption of energy to optimize sophisticated criteria beyond ensuring local end-user comfort satisfaction. It's necessary to enable integration between buildings and the surrounding environment. Buildings have become integrated concepts in which advanced systems work together to reach optimal performance in energy, comfort, and health. Mainly the convergence between different engineering fields and the overlapping field of building technologies and services, namely the responsive building components, has a great future potential to realize the next step in energy saving. Energy consumption in the built environment represents approximately 40% of end-use energy consumption in the European Union. For office buildings with HVAC systems, the energy consumption of these systems corresponds up to a quarter of the total energy consumption registered in the building. Thus, several building concepts are developed to evaluate their impact on HVAC energy consumption and the capacity of installations.

Additionally, external factors that influence building performance such as inter- building effects, and climate change are analyzed. The outputs resulting from a dynamic thermal behavior analysis - performed in the building simulation tools- of the building concepts are translated into performance indicators of energy, sustainability, and costs that allow users to make a conscious decision based on the factors that are most relevant to them.(Geográfica, Energia, Giuseppe, & Marques, 2016). Cities emit 80% of the greenhouse gas (GHG) industry, transportation, mobility, and building construction it produces three-quarters of the world's (GHG) emissions. They're home to well over half the world population. The research, therefore, spotlights on new methods that make our buildings interact with the external environment using modern technology, smart materials, and simulation programs thus achieving the architectural response to the surrounding variables to reduce Co2 emissions and pollution.

**Keywords:** Responsive systems, building performance, Built Environment, smart materials, thermal performance.

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## Eco-Villages Planning

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Eco-village design is a new field of knowledge still under development. It will be the physical manifestation of an increasing role in future urban development world – wide. In order to ensure ecological sustainability, cities around the world have to decrease their environmental footprint. The elements of eco -villages include sustainable design, definition and principles, the necessity of ecological design, green building, and ecological architecture, the second element is infrastructure, recycling- water, sewage waste .the third element is permaculture, finally is resource and energy consumption.

Ecology is one of the important issues in creating sustainable residential areas like eco-cities and eco- villages. Today, the development of cities and villages has created many environment damages, and presenting some solutions to minimize these damages is useful. We should find a new model of the residential area to fulfill with the new community requirements and create sustainable development in urban and village residential areas. The present study introduces and evaluates eco-village and how eco-villages have considered the concept of sustainability. Also, this study Evaluates how sustainability goals based on the main solutions of sustainable architecture can focus on three important criteria of ecology, society and culture. The study method is based on document and analytic descriptive study. Finally, some solutions are introduced to create eco-villages based on the criteria in sustainable architecture.

**Keywords:** Eco-village, Ecology, Sustainable architecture, Sustainable development

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## A Blue Green Approach For The Resilience Of Mediterranean Cities

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There is a growing recognition that urban areas will be profoundly affected by climate change whether in coastal areas, inland, or in high-altitude locations. The need for climate resilience strategies is growing. Different adaptation plans are being considered. One of the most important measures is increasing green spaces and natural elements in the city for their impact whether cooling, flood management or water management. This paper will discuss Mediterranean cities resilience strategies through planning a Blue Green infrastructure to aid in the adaptation to climate change.

Mediterranean coastal cities are high risk areas. These cities will face many side effects whether drowning from the sea level rise, droughts in desert areas, urban heat island effect in compacted dense areas or flooding. It is becoming clear that climate change will profoundly affect these cities in more ways than one. As urban areas today accommodate half of the global population, and will host two thirds of all humans by 2050, there is a need to focus on the adaptation of cities and urban communities to climate change. Investments made in the coming decades will be of utmost importance not only with regard to mitigating further climate damage, but also in terms of how well cities are equipped to respond to impacts within predicted climate scenarios. The aim of this paper is to analyze two Climate resilient Mediterranean cities Valencia in Spain and Thessaloniki in Greece to form a resilience plan for Alexandria.

This paper will be divided into two main parts. The first is an inductive methodology through which examples of Mediterranean coastal cities are analysed to form a list of criteria and resilience strategies. The second part will be forming a strategies and a list of recommendations on the case study Alexandria to propose a blue green infrastructure approach to the climate change crisis.

**Keywords:** Climate Change, Mediterranean Cities, Resilience, Blue Green Infrastructure

## Impact of Integrating Intelligent Photovoltaic Skin Facade on Daylighting Performance in Lecture Halls

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Proper lighting is a crucial factor in the overall success of a lecture hall of all educational facilities. It is important to state that daylighting harvesting in indoor spaces has a specific effect on the global energy performance of a building in terms of heating and cooling loads. Meanwhile, Sun –Tracking systems or as it called daylighting tracking systems are technique to both reduce excess daylight at the building perimeter and increase daylight availability in deeper zones of building indoors. This paper investigates the effect of integrating IPSF (Intelligent Photovoltaic Skin Façade) as tracking system as well as intelligent tracking facade on daylighting performance in lecture hall. The main goal of this research is to achieve efficient design of intelligent PV modules and to identify it's parameters to improve the efficient of daylighting performance in lecture hall. The research conducted to a typical lecture hall space in Cairo, Egypt. The simulation focuses on the evaluation of the visual performance conditions in terms of illuminance and luminance distributions in lecture hall by using the climate data of Cairo city , Egypt, where the climate is desert clear sky. The simulation process of a mockup model generated by Rhino and Grasshopper plug-in and by using Diva-for-Rhino a plug-in used to interface Radiance and Daysim was used for calculating the annual Daylight Availability of the space. Results showed that performance of IPSF are related to its position, depth and rotation angle. Also, it showed that the daylighting performance could be significantly enhanced; the daylit area can reach more than 79% of the space in the case of PV skin façade.

**Keywords:** Building-integrated photovoltaics, Intelligent skin, Daylighting performance, Shading devices, Sun-tracking systems

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## Human Thermal Comfort, a Framework for Public Parks Assessment Using Parametric based simulation engine (PBSE)

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Public parks are one of the key parameters for a livable city. Its usability and functionality depends on many factors, one of them is the thermal comfort. Through design phase and Digital assessment, running a simulation for design optimization on outdoor thermal comfort is complex where the simulation parameters are forecasted variables. Hence, using indices make the process easier. The aim of this research is to define an appropriated index through literature and apply it on an existing case study using parametric based simulation engine, in order to identify weather the case is comfortable or not. The selected case study for the research is Al Minya Al Gdida residential public parks, as the width to height ratio between the parks and building height is low. Hence, the research will assess the case study using PET thermal comfort index, in order to achieve design recommendations for the parks towards thermal comfort optimization.

**Keywords:** Outdoor thermal comfort – PET – Thermal comfort Simulation - Parametric

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## Kinetic Origami Shapes: A Futuristic Theory for Dynamic Structure Stability

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In the historical development from static to dynamic perception of space there is always a change in the concept of architectural style. Materials get to be lighter, structures more energetic and spaces get to be more dynamic. Architecture becomes liquid; fighting force would no longer be by mass but by inertia. It represents the end of typology and the rebirth of morphology. Our task is to investigate and develop a new structural system capable of articulating the dialectics between material, structural systems and spatial perception. It will be the new architecture style for the next millennium. The Origami formations and its effect of structural stability is the basis of this argument, where the rationality of the right angle will be overcome by the irrationality of floating and defying gravity. It will be the new DNA in architecture and it will represent the marriage between science, technology, structure and spatial perception.

**Keywords:** Origami, Crease lines, Gravity, Dynamism



## Egyptian I-cities Planning Based on Deep Learning Future Egyptian I-cities

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Recent years, in Egypt, have witnessed developments and changes that in turn make significant improvements in cities planning and designing to cope with the digital transformation age. There is an urgent need to develop Egyptian cities services to be adapted with modern technology.

Intelligent Cities (I-cities) solutions have to be multi-disciplinary including socio, cultural, environmental, and technical aspects. This paper will shed lights on the modern-technological transformation happening around us with a focus on I-Cities and how they are planned based on deep learning; furthermore, an analysis will be conducted for all services offered in planning an I-City based on monitoring collected data related to energy and water consumptions to minimize and optimize waste based on the feedback system and ensure an efficient utilization for the clean energy sources. The paper will explain the required services that should be offered to present an integrated I-City. The offered services are planning of buildings, small organizations, mall for entertainment, state of the art wide security services, and markets supported by different sensors based on sensor fusion and deep learning; hereafter, no need to check out. Moreover, the user in the I-City will have the facility of shopping from inside his smart home using Virtual Reality (VR) technologies. Besides that, a museum inside the I-City is to be established, where pictures of known-men-of-honour are to be presented. The user can easily call upon the information about every picture in the museum using VR techniques, hence allowing a new level of interaction.

**Keywords:** Deep learning, Virtual Reality, Digital Transformation

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## Visual and Thermal Effect of Contemporary Buildings' Facades on Urban Spaces

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A Striving for a comfort urban district, form, urban geometry and material design are key- decision drivers to avoid the urban heat island (UHI) effect. Commonly, contemporary buildings' façades are associated with modern materials that aimed countermeasure only the microclimate indoor. Recently, microclimate outdoor found to be highly responded with the surrounding materials on account of their optic and thermal properties. The perception of the occupants indoor is differently from outdoor for same material. Although researchers taking into account the horizontal material properties for the outdoor spaces, consideration of vertical elements are mandatory to prevent visual distraction and overheating for multifunctional urban districts. It is found that studies were limited for investigating the visual and thermal comfort of facades material to prevent UHI. So, this paper aim to investigate the contemporary glazing/opaque materials that define a relationship between indoor and outdoor comfort. The study also presents a review of the data collection methods utilized by the research studies that aim to highlight the recommended optical and thermal properties of materials. It creates an open discussion on the possible materials that has a property of comfortability in outdoor space to prevent the effect of UHI. The paper provides a concise starting point for future researchers interested in the cities' outdoor comfortability.

**Keywords:** Urban spaces, Outdoor comfort, Optical properties, Thermal effect, Materials

## Branding Museum

Framework for Integrating Interactive Display Techniques through Movies

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Since the 20th century, museums are a vital aspect in the country which create a strong cultural identity, improving the economy through raising the tourism rates, providing source of learning, and sense of place for visitors. The roles of the museums were shifted from being just preserving artifacts and monuments in glass boxes to be an interactive educational tool where visitors are attracted more to lively museums that convert them from consumers to active participants. In the light of this role, some movies started to integrate museums leading to new attraction magnet that leads to cinema growth. As an interactive tool in cinema, IMax started to increase allowing people to engage in this experience virtually. Branding museums through movies is one of the innovative applications of smart technologies used lately causing the cities to be much stronger, improve resources allocation, strengthen communication and social cohesion. Museums integration in movies affect the emotions and visual perception of watchers that consequently increase their willing to visit museum.

The aim of this research is to design a framework to integrate the movies and interactive display techniques for branding museum to enhance visitor's engagement and experience. This research will pass through qualitative method which is based on analyzing the museums integrated in movies and its relationship with the display techniques and the visitor's engagement. This guideline should enhance the museum's experience and enhance visitor's engagement.

**Keywords:** Interactive Display Techniques, Museum Visitor's Engagement, Museum Movies Branding

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## Hydrophilic Building Design for Green Roofs in Arid Humid Regions

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Adding green roofs to buildings is an efficient way of incorporating greenery and biodiversity in urban environments. Green roofs increase a buildings' aesthetic appeal and generally improve a buildings' energy performance whilst increasing its amenity value. The implementation of green roofs is commonly halted due to many issues. Among these issues is that green roofs require regular irrigation and maintenance, which significantly adds to the overall cost of constructing green roofs.

This paper discusses the possibility of using hydrophilic design as a means of providing a sufficient and sustainable source of irrigation to integrated green roofs in arid-humid regions. This will be conducted through investigating different passive methods of water harvesting from air humidity and analyzing different types of green roofs and their water requirements. This paper will present a framework that will enable users to identify the appropriate hydrophilic, water harvesting method that will produce the necessary amount of water to irrigate each type of green roof.

Employing these hydrophilic design approaches will allow green roofs to be self-sufficient by cutting the required costs for the maintenance and irrigation processes.

**Keywords:** Hydrophilic Design, Green Roofs, Passive Water Harvesting

## Upgrading Resilience

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A review study of literature dealing with resilience in psychology and psychotherapy and how to upgrade human resilience using patterns of Neuro Linguistic Programming (NLP) as a promising methodology to replicate excellence in life in different aspects such as in self-actualization and resilience.

Living nowadays in a world full of wars, insecurities and natural disasters (earthquakes, tsunamis) and with global media spreading all scenes of oppressions and victims all over the world, comes the need for resilience as a way of dealing with such a mess facing humanity.

Resilience, as a positive psychological concept, refers to the ability of humans to successfully cope with stressful life adversity situations without being stuck or manifesting post-traumatic disorder syndrome (anxiety, self-pity) and depression. Stressful situations might be daily stresses, death of beloved, separations, chronic illness, losing money or losing social status.

Resilient people experience unpleasant thoughts and feelings but handle them in ways that prevent them escalating into more serious long-term problems such as anxiety and depression. Resilience in positive psychology generates more with experiencing the social world from more self-awareness and more self-directed. It is more a need for detachment and privacy. People are here determined by inner rather than outer world as they are more fully focused on themselves as fully complete mature humans able more to face realities and whatever it brings.

Resilience refers to a way of thinking and behavior aligned with this thinking, it needs to apply what really in thinking in appropriate output behavior. It is a behavior to be learned and a meaning level to be analyzed. In another way, resilience can be considered as a skill to carry out a task to achieve the intended results within proper timing. Resilience is an acquired skill to restore to the inner resources as a human being to cope with whatever challenges may face in the shortest amount of time to avoid trapping in the negative consequences.

Neuro Linguistic Programming (NLP) has a role in upgrading resilience as it clarifies the way people apprehend (map) their sense of realities. Through this clarification, it offers patterns to transform human experience. It enriches human abilities and the understanding of life.

This study will review techniques used in psychotherapy and NLP to upgrade resilience and to help people with stressful situations to develop resilience.

**Keywords:** Psychological Resilience - Neurolinguistic Programing - NLP - Cognitive Psychology - Mind Fullness

## An Approach to Re-evaluating the Heritage Urban Site of Matmata, Using WELL Rating System

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Historical buildings are facing many challenges to prove their durability and resilience through time. The concept of resilience involves getting adapted with continuous changes of social, climatic and environmental trait. The Southeast Tunisian cave dwelling of Matmata is a well-known example of historical urban form which formation takes into account the geological and geomorphological context of the site. Matmata provides an interesting example of geo-heritage on which was developed an important cultural and architectural heritage. The study discusses the main characteristics of Matmata in light of the WELL rating system, which was established in 2015. The WELL system focuses on the impacts of buildings over human health. It gives credit to designs that promote physical and psychological health of the users. The study reveals some of the pros and cons of Matmata cave dwellings and provides recommendations for further modifications to assure further resilience to climatic changes and human relief. The historical dwellings has proven good performance in relation to thermal comfort, acoustic comfort, daylight interaction, solar glare control and fitness promotion. It needs further modifications to fit air purification needs and clean water supply as well as altruism encouragement and social interaction with others.

**Keywords:** Historical cities, Matmata, WELL rating system, Health Promoting Design.

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## Climate Change adaptation; Vulnerability Assessment of the Historic City of Rosetta, Egypt

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The complexity of the vulnerability of historical cities to climate change comes from its fragile assets and composite nature. The city of Rosetta was inscribed in the world heritage tentative list for its outstanding tangible and intangible values and its unique coastal position. Rosetta is subjected to multiple climate change risks; this has called for the importance of taking actions.

**Data and methods:** Previous studies adopted various approaches to determine sectorial vulnerability of the city; the approach that is used here is based on UN- Habitat's Cities and Climate change initiative (CCCI) as it has been field tested in several locations. It started by documenting climate change primary and secondary impacts, then, carrying vulnerability assessment which is a function of exposure analysis identifying possible climate change scenarios, sensitivity analysis and adaptive capacity analysis or responsiveness.

**Results and discussion:** The paper identified thresholds, threat levels represented in influence diagram and risk plotting methods. This paper determined the most vulnerable places, institutions, populations and sectors in Rosetta; it identified where adaptive efforts should be focused through vulnerability assessment.

**Conclusion:** the paper rated current capacity level and preparedness degree through the vulnerability assessment summary matrix described in degree from high to low in order to prioritize risks, vulnerable groups and then preliminary recommendations were suggested as a guideline for adaptation actions.

**Keywords:** Vulnerability Assessment - Climate Change - Historic Cities

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## An Integrated Framework for the Sustainable Development through Adaptive Reuse of Heritage Buildings

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The adaptive reuse proved an efficiency in protecting the heritage buildings against deteriorations by adding new values to those buildings which have lost their original function. The development of heritage buildings, should be compatible with the significant cultural values and sustainability pillars within the needs of the local community.

The research proposes a framework contains an assessment criteria in addition to a guideline for practical implementation to evaluate the development of heritage buildings by proposing sequential steps to be followed through three main phases (before, during and after) the adaptive reuse, to create an integrated system consisting of two main levels the first is the practical application, and the second level is the assessment criteria.

**Keywords:** Heritage, Conservation, Sustainable development, Assessment criteria, Burra Charter.

## Assessing the Implementing Lean Construction in Real-Estate Compounds to Achieve Resilient Cities

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The construction industry is one of the most challenging and dynamic industries nowadays. These factors contribute in making this construction a high-risk industry, and there are many challenges facing the construction manager these days. Residential compounds are becoming one of the most important projects these days, some of these projects become landmarks for a country and bring significant prosperity, but some become unforgettable catastrophes. Lean construction is helping to assure a better construction process especially to cities where could enhance moving towards resistance.

This paper is focusing on the construction of the residential compound as these kinds of project are growing quickly. For a construction company, lean construction means that the company can complete more jobs and produce significantly less waste which in turn increases profits and keeps costs down. It helps construction firms to make more money in less time than with traditional construction practices.

The purpose of this paper is identify the problems that raises during the construction of these kind of projects and how applying the lean management in the real-estate compounds' construction can avoid these problems benefiting the construction process and the value of the product presented to the customer which achieves resilience in cities.. The method used will be literature review depending on qualitative analysis from textbooks, academic journals, professional magazines, conference and seminar proceedings, thesis, organizations and government publications as well as Internet and related websites. The results of this paper would help to achieve resilience in cities.

**Keywords:** Lean Construction (LC), Lean Management (LM), Project Management (PM), Resilient cities, Work-in-progress (WIP), Real-Estate Compounds.

## Resilient Cities and Architecture

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Wars represent an extreme form of political conflict that escalates into violent confrontation between rivals possessing. When the city becomes the theatre of this conflict, it becomes in a state of ambivalence; each side will have their own interpretation of the architecture and of the spaces of everyday life. As such, the architecture of the city is no longer perceived with its mere physical characters, instead, new meanings and different functions are identified following the visions and goals of the combatants; for instance, what is assumed to be a shelter for one side, can be seen as target for the other. This interpretation of architecture is directly correlated with perception of its position as a war medium; whether a base or target, protected or attacked, it is much related to the interpretation of its subjectivity and objectivity. This duality of position, which architectural and urban elements hold in wars, is a crucial feature that depicts in strategies and tactics of both attackers and defenders. The subjectivity of the architecture replaces its objectivity, and exposes it to new meanings and functions for its users whether they were civilian residents or military commanders.

This paper aims at analysing the position of the city and its architecture in warfare, in terms of its perception and deployment in military operations and resistance. First part of the paper highlights and reviews relevant literatures tackling the relation between the city and its architecture with war. Second part of the paper considers the invasion of the city of Nablus in Palestine by the Israeli army in April 2002 as a study case to go in deep analysis of this expanding urban phenomenon. The case of Nablus presents how the city and its architecture are used for both military control and resistance and socio-spatial resilience. Using the concept of inverse geometry by the Israeli Army, the analysis demonstrates how several pre-established concept of visibility, frontier, wall, outside, inside, domestic and public are blurred and reinterpreted in moments of crises to adapt to needed situation being military control or resistance that in many times happen in the same space and time but on different X, Y and

Z coordinate. Consequently, reflecting the multiplicity and complexity of architecture and its space that this paper calls Nakatomi Space; a space that has the capacity to be bended wherein buildings reveal near-infinite interiors, capable of being traversed through all manner of non-architectural means and composes a larger scale Rizhom.

As such, it can be understood that city as a 'battle space' has a subjective feature; this subjectivity is inseparable from its dual position as target or defence line. The duality of the city as a battle space can be considered a dominant character of the new urban warfare where the city is being seen as site for offensive as well as defensive activities, a space of destruction as well as production/reproduction, an obstacle as well as a tool of war and resistance at the same time. The duality of the city as war medium grants the Architecture its instrumentality as war agency.

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## Dynamic Architecture as a Sustainable Urban Solution to Adapt with Sea Level Rise in Coastal Line, Egypt

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Climate scientists predict an expected global temperature rise of 1.5 O Celsius by 2050, which may lead to a sea level rise of 18-40 cm by 2050, flooding large areas of coastal and delta cities with water. The problem will be exacerbated by the fact that the lands of the Delta are falling geologically at a rate of 5 millimeters each year, which is expected to increase the erosion of their lands and submerge them with water, thus sinking the urban and agricultural areas will forcibly displace them. Dynamic architectural solution can be considered to adapt to the continuous rise of water levels and interact with it by moving the building vertically. The study discusses the problem of sea level rise which threatens coastal cities with floods, causing mass migrations seeking environmental refuge. This problem has many impacts over urban, economic, social and environmental aspects. The study discusses using VDB which is vertically dynamic Building to avoid drowning. The suggested design adapts with the expected sea rise by its dynamic resilience and ability to move downward and upward as needed. Details are given about the design and its pros and cons. This type of urban construction can preserve our cities, prevent environmental refuge, save our historical areas and preserve our urban fabric. It may also help transforming areas subject to sinking into touristic areas with more attractive pattern similar to Venice. Dynamic architecture can be a good form of city resilience and resistance against tides and floods in Egypt's coastal region.

**Keywords:** Climatic change - Anti-flood buildings - Sea level rise- Dynamic buildings - Resilient Architecture.

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## The Resilient Environment of Coastal Cities

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Coastal cities are becoming vulnerable to natural phenomena brought about by climate change. Over the last three decades, the implementation of various emerging smart technologies, infrastructural advancements, and awareness management has helped in understanding and mitigating the harmful impact on coastal cities. However, cities, which were historically identified as collective settlements and public domains, are now becoming more “grand” and are called mega-urban areas. Although the extensive research and progressed applications’ development in various areas of the city, including the environmental monitoring, water management, biodiversity and ecosystems services, surveillance, lighting management smart services, and crowd-sensing, there is a clear gap in the application of urban design concepts in the creation of a resilient environment. This research focuses on constructing conceptually a resilient approach that can be part of the solution to the pressing problem of the flooding phenomenon of Jeddah city in Saudi Arabia. The paper aims to portray the impact levels on the city and city inhabitants while exploring the required components that develop smart parks’ systems and their applications to withstand the flooding phenomenon. The main objective of this study is to suggest design guidelines for city parks that accommodate water retention systems to create district parks that are able to serve people in a flooding time in a responsive manner.

**Keywords:** Flooding in Coastal Cities, Resilient Urban Environments, Resilient City Parks, City Prosperity Index, Jeddah in Saudi Arabia.

# The Resilience of Alexandria Waterfront Transformation and Development

## “Waterfront physical-functional dimension”

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Alexandria is the second largest city in Egypt. It is a seashore city on the Mediterranean and its main port. Generally water is a very attractive element for all different cultures, ages and classes of people. The Waterfront has the ability to give a good public space for different users to practice various social activities. In the past years Alex waterfront has witnessed several changes that affected the usage of citizens and their way they connect to the city.

This research aims to investigate whether the formation and transformation of waterfront throughout the years and based upon the usage of its public spaces resilient enough to embrace all the expected activities for all users or not.

The research will focus on the physical -functional approach for Alex waterfront. It will study the interaction between the cornice urban space and its physical attributes. The first quality targets the waterfront physical elements like the form, legibility, etc. The second quality focuses on the functional dimension like vitality and comfort.

It is an ongoing research that will document the changes over almost the past ten years of one space point along the cornice to measure the resilience of the urban spatial-physical functional existence and its impact of the public space usage. A Framework with all subject elements will be the tool to measure these changes .The study will be surveyed by direct field observations and photography to reveal the types of users, their activity patterns, in relation with the design features. The results will be put in a table in order to come out with a conclusion and recommendation to this research.

The main issue will be documented through this research is whether the city resilient enough to maintain its positive impact on users life and cope with the changes throughout the years or not.

**Keywords:** Resilience - Waterfront - Public Space - Transformation - Functional - Spatial Dimension.

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## Analytical Study for the Impact of Urban Transformation in Historical Areas

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Historical areas directly reflect urban transformation and the change of social life shaping the environment of cities. However, they have been experiencing rapid transitions due to rapid population growth, economic development, and urbanization. Here, the research aimed to reach guidelines to guarantee that urban transformation will successfully face the rapid transition occurring in historical areas. That can be occurred through integration of conservation experience and strategic planning in practicing urban transformation. The indicators of achieving urban transformation in historical areas have been identified. Those indicators have been deduced from principles of both urban transformation and historical areas. Each principle contains several aspects that can be improved through the indicators. These indicators have been comparatively analyzed in urban transformation of two historical examples. The analysis arranged the importance of each indicator of urban transformation in historical areas. Finally, the research shows that urban transformation can be successfully occurred in historical areas by improving its principles through indicators.

**Keywords:** Urban Transformation – Historical Areas – Heritage – Sustainability.



## Investigating the Effect of Social Capital on the Resilience of Furniture Industry Grassroot Economies in Damietta, Egypt

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Social Capital is a vital asset that contributes to the development of professions as well as communities, specifically in small scale urban settings with a dense social structure. This paper aims to investigate and map Social Capital for furniture industry grassroot economy in Damietta-Egypt. Furniture enterprises in this context form the main economic base of the city socially inherited through generations. The research examines the hypothesis of Social Capital being the main success factor of this economic cluster, building on Porter's Competitive Advantage theory and Putnam's Social Capital theory, linking networking, trust and norms to the spatial distribution of furniture enterprises in the city (Network Theory).

The case study's complexity related to current challenges in light of recent development directions that compromise the existing coherent urban and social patterns. Quantifying a generally qualitative measure such as social capital provides data-driven commendations for community-oriented decision-making towards socioeconomically sustainable development.

The methodology adopts a mixed methods approach, starting with pilot interviews that verify a geospatial GIS network map based on field survey. The research utilises Network Theory and geolocation data to quantify Social Capital. The output is a framework and visual toolkit (GIS mapping) for Social Capital that can be appropriated to other industries and urban settings that resemble similar characteristics to Damietta.

**Keywords:** Grassroot Economies, Economic Agglomeration, Furniture Industry, MSMEs, Network Geospatial Mapping.

## Improving Students' Social Interactions through Designing Sustainable Academic Landscape

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Landscape is the art of planning, designing and management of land, applying natural and man-made elements, through the implementation of cultural and scientific information with, mentioning resources management so that appropriate landscape can serve a useful, healthy and enjoyable objective. The academic landscape is philosophical concept toward the environment, social, and economic characteristics of campus and education that varies inside a region for the process of preservation, transfer and production of knowledge. the academic landscape in the field of education philosophy. Generally, the characteristics of this concept are described within other ways to represent the reality of education as: vitality, spatiality, sustainability, contextuality, and rhythmicity. In universities, the design of landscape plays a significant role to achieve better environmental and social interaction of students, so that the absence and lack of landscape in universities is a big fault in the design, which effect on the social interaction of the students. The method of this research will follow four phases starting with analyzing the strategies and goals of academic landscape. Followed by discussing the criteria of sustainable academic landscape. Then defining the exciting academic landscape elements in the university. Finally analyzing the cognitive map errors to show level of social interaction. The aim of this research is to determine the impact of academic landscape on the students' social interaction. The expected results will set out a checklist based on the strategies, goals, criteria, cognitive map and urban design elements of academic landscape that urban designer can use to measure the social interaction in the university.

**Keywords:** University, Academic Landscape, Students' Social Interaction, Sustainable Landscape.

## Outdoor Spaces Spirit and Its Impact on Heritage Building

The pillars affecting heritage-building condition

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The heritage monuments are known for their spectacular architecture and cultural value that creates a dynamic, vivacious and exceptional spirit for the surrounding context. As a consequence of that, this sort of buildings usually has the main attention of the government to prevent its deterioration regards to natural disasters and climate changes, whilst the urban space surrounding the heritage building in cities is widely seen as a massive resource that impacts the heritage building condition. The research aims to pinout the importance of the users' activities practiced and urban facilities provided in the urban space to show how the space spirit affect the heritage building. The result contributes towards setting criteria divided into three phases. Phase one will target the users' behavior and how they deal with the space, phase two will target the space urban design and landscape, phase three will observe the historic building and how it is affected by the first two phases. This considers as pilot criteria that can be used by urban designers in order to deduct the main factors that affects the heritage building condition either positively or negatively.

**Keywords:** Heritage Building – Positive Outdoor Spaces – Negative Outdoor Spaces – Urban Facilities – Heritage Conservation

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## Assessing Sustainable Neighborhoods Concept in Egypt

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Neighborhoods face various urban challenges and risks that has a great impact on the environmental, social and economic development currently and in the future. Different rating system have been developed by developing countries and relevant to the rapid urbanization such as BREEAM Cities, CASBEE for Urban Development, Estidama Pearl Neighborhood Development, DNGB Urban Districts, Green Star Communities, LEED for Neighborhood Development and STAR Community to foster sustainable city and urban development. Since the start of the 21st century, developed countries are utilizing neighborhood sustainability assessment methods to assess their progress in meeting sustainable development targets. In Egypt no formal assessment method has been implemented till now to assess the construction and development of neighborhoods. The research aims to develop a neighborhood rating system criteria for the following three categories, Site selection, Water and Energy. The results deducted a pilot checklist for the for-mentioned categories that suits the Egyptian Context and can be applied by planner in Egypt.

**Keywords:** Neighborhood Sustainability, Assessment Tools, Sustainable Design, Site Selection, Energy Management, and Water Management.

## Building Information Modeling as an Approach for Increasing the Competitive Advantage of Architectural Design Firms in Egypt

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Recently, the development of new technologies results in continuous change in the construction industry that causes pressure on both local and worldwide markets. Nowadays, many Egypt companies face a number of problems in the market due to the adoption of outdated strategies that make them unable to compete globally. Therefore, it is significant for the firm to maintain competitive advantage in order to survive in the market; this could be achieved in various methods such as adopting new techniques and developing competitive marketing strategies. Accordingly, this research will be focused on the application of new technology such as building information modeling as a process to enhance competitive advantage in architectural design firms and the challenges that face in the adoption of these technologies. The research will study international case study that overcame these problems and managed to compete in the construction market. Finally it is an approach for implementing the Building information modeling technology in the architecture design firms in Egypt.

**Keywords:** Competitive Advantage – Architecture Design Firms in Egypt – Building Information modeling – Implementing BIM.

# Mitigating the Effect of Urban Heat Island in Residential Areas by Using Landscape Elements

"Case study 10<sup>th</sup> of Ramadan"

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Urban heat island (UHI) is a phenomenon occurred by the accumulation of heat especially in metropolitan areas due to intense human activities. It is considered one of the most dangerous phenomena threatening the environment. It affects humidity percentage, wind patterns, causes hurricanes, floods, heatwaves and contributes in exacerbation of global warming. The increase in land surface temperature (LST) due to dark materials and reduced vegetation increases the effect of UHI by up to 4 Celsius degrees higher than the surrounding rural areas. This paper aims to investigate the effect of UHI in residential areas and how landscape compositions could be employed to mitigate its effects and creates a landscape designing guideline to 10th of Ramadan city. The results will be based on qualitative methods by collecting data about UHI and comparative methods through comparing the data collected about the two case studies. Moreover, simulative methods by using ENVI-MET and quantitative methods through using GIS.

**Keywords:** Urban Heat Island, Landscape Elements, Land Surface Temperature, Vegetation, Land Surface Land Use.

Sustainable Urban/Landscape Design And Solving Environmental Problems

## Integration Of Landscape Elements Into Office Buildings To Form Sustainable Biophilic Environment

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Nowadays, people spend most of their day indoors as in offices and classes. They are not exposing anymore to nature and gaining advantage of it. This paper investigates the idea of integrating landscape elements into office buildings. This can be done by applying contemporary landscape techniques indoors to achieve a sustainable, healthy and biophilic environment. Landscape elements are classified into two pillars; environmental and architectural. The environmental pillar as microclimate modifier, while the architectural pillar as a solution to environmental issues. A sustainable biophilic environment will reflect the impact of nature not only on people, but on architecture too. The aim of this paper is to study and examine the impact of landscape elements on people and buildings as well. The studies in this paper are carried out searching other papers discussing same topic, adding to some respondents and questioners done to different categories and gender of employees. Another method is a comparative analysis between; office buildings integrated with landscape normal office buildings without integrated landscape elements. Moreover, simulation method is done to examine the effect of nature on building environmentally as well. It is expected that there is a strong relationship between architecture and landscape elements as human and nature are related to each other as well.

**Keywords:** Landscape Elements – Office Buildings - Sustainable Biophilic Environment – Biophilia - Biophilic Architecture

## **Integration of Urban Parks within Residential Streets in Egypt** “Case studies; El-Rehab City and Nasr City”

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Residential landscape is considered to be the main important mean of creating comfortable environment for residents to live in. Though the residential landscape do not constitute a significant portion in our urban environment, reside in environment that is rich with residential landscape and good environment condition. “The World population in urban areas is projected to grow from 3.3 billion people in 2007 to 6.4 billion by 2050. Most population growth projected in urban areas will be concentrated in cities and towns of less developed regions (Low Choy, Wadsworth and Burns 2010). Recently, the increased urban population in Egypt is a product of internal migration from rural areas to cities. These new urban dwellers bring with them different expectations of the urban environment, such as: urban open space, better living conditions, ease of mobility, and diverse cultural practices. This internal migration has influenced the formation of the contemporary Egyptian metropolis during the mid-20th century. As a result of this phenomena, it became very important to integrate public open spaces and parks within the residential urban areas. (Maat, 2006). Moreover there is a huge lack of planning and designing a sustainable residential parks. These parks should fulfill the resident needs and increase the communication among people, which definitely will affect the residents in their social life. The objective of this paper is thus to purpose a criteria that should be enforced to guarantee an acceptable level of integrated parks within residential areas. Also this paper aim to develop a new method to maintain and assure ecological balance of green areas in residential urban areas, Qualitative research method was followed in order to tackle the paper objective; it was applied by means of a literature review, which included urban parks, its characteristics, and benefits of residential urban parks. Moreover, two pioneering examples for residential urban parks have been analyzed. Findings indicated that urban parks plays a vital role for human life. The study provides an evidence that, urban parks affect the residents behaviors in their social life and their feeling towards life. As it will also affect the environment that they are living in.

**Keywords:** Residential Areas - Urban Parks - Social life - Mental Health



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## Building Information Modeling BIM as a Development tool for the Management of Construction Projects

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Despite the tremendous development in the field of digital technology that produced the software and techniques influenced in the field of architecture and construction, and thus the production of architectural and urban, which is imperative that we keep up with this development, and employment and continuation of the same efficiency in all phases of the project will bridge the gap between design and implementation phase, and the most important of these techniques the use of Building Information Modeling (BIM), it is a Database, Not just 3D Drawings, it refers to a digital collection of software applications designed to facilitate coordination and project collaboration, BIM has the potential to provide more efficient operation, not only as part of design and construction but also in operations and maintenance. Accuracy is another main reason. BIM appears to offer greater accuracy than what our current practices produce. This paper aims to determine the benefits of integrating BIM technique in project management and recognize the role they play in The construction industry and practical feasibility of it compared to the previous systems, the practical study depended on two parts, the first by carrying out structured questionnaire survey from construction industry' experts. The second is a case study. The paper is concluded with some important results. It seeks to show that the BIM systems improve communication, collaboration, higher-quality project decision making, and more comprehensive planning and scheduling. In the end, we should see better quality, plus increases in productivity and profitability.

**Keywords:** BIM, Management, Construction project

## Design Strategies for Integrating Biophilic Design to Enhance the Students' Performance in Existing Primary Schools in Egypt

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Schools are the most important buildings that affect the generation's way of thinking and way of living. Egypt is one of the countries that experience many problems in its current design practices in their school building's design strategies. Most of the schools are neglecting the impact of linking classrooms with outdoor spaces on the student's behavior and way of learning. Students need to feel free, relaxed and motivated in order to be more effective and productive. There are various types of interior designs that could enhance the classroom's interior space, so that it can be more comfort and interesting to students. Biophilic design is one of the sustainable design solutions that could maintain the ability of having indoor spaces linked with the outdoor space through the use of plants, daylighting, textures, materials and colors. The aim of this research is to propose a set of strategies for integrating Biophilic design to enhance students' performance in exiting primary schools in Egypt. The methodology adopted is divided to three parts. The first part will define the Biophilic design and its impact on the student's health and performance. The second part will clarify the Biophilic design elements and frameworks to identify the suitable elements for the classroom's interior design. The third part will discuss the design considerations to implement these elements in the classroom's interior design. According to the three parts the final conclusion will specify a matrix linking between the Biophilic design strategies and the student's health and performance. The result expected from the matrix will identify the suitable Biophilic design strategies to be implemented in the school's classrooms to enhance the student's health and performance.

**Keywords:** Biophilic Design, Indoor Green Spaces, Education in Egypt, Design Strategies, Student's Performance

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## Enhancing Users' Comfort in Existing University Libraries In Egypt Through Daylight Strategies

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University libraries are one of the most important places that offer knowledge, services and a suitable study environment. A well-designed library space can have a great impact on students' performance and social behavior. Daylighting is a controlled tool that affects the perception, visual, psychological comfort, and behavior of library users. However, many of the current university libraries in Egypt lack the presence of efficient daylighting strategies and without consideration of how daylight affects students' comfort. The group study area, social gathering space, and private reading space are three different areas in the academic library with different usage and different daylight distribution. This research aims to identify a set of design strategies for using daylight to enhance users' psychological condition, interaction with the surrounding, and visual comfort in private reading space, group study space, or a social space, in the university libraries. The research method will be based on four phases starting with analyzing the different strategies of daylight in a space. Followed by discussing the aspects of daylight that influence human visual and psychological condition. Then, analyzing each space in the academic library by understanding its different usage, daylight distribution, and effect on student perception and comfort. Finally, deducting a design method that will be used a checklist (matrix) to identify different sittings of daylight strategies in different library spaces. The expected result will be deducted from the design matrix to identify a set of efficient daylight strategies for selected spaces in academic libraries to enhance user's visual comfort, psychological condition, and interaction with the surrounding.

**Keywords:** Daylighting Strategies, User's Comfort, University Libraries, Visual Comfort, Psychological Comfort

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## An Approach for Sustainable Material Selection Using Life Cycle Assessment

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The construction industry is one of the biggest exploiters of both renewable and non-renewable resources in the world. Therefore, it was unavoidable that concerns will be raised with respect to the environmental effect of this industry. As the procedure of building consume many material through its life cycle, the determination and utilization of sustainable building material were assessed due to their important role in the planning and construction of a green building. This study is set up to show an approach for sustainable building material selection and their effects on nature. It likewise talk about the life cycle assessment as a methodological role and system and its limitation for the examination of sustainable building material. This will be conducted through a comparative analysis of the most common material used in construction industry in Egypt; which are concrete and steel. The analysis investigates the amount of energy consumed and greenhouse gases emitted through out the material life cycle. This study shows that using steel in construction can be less damaging to the environment as well as saving energy used in building life cycle.

**Keywords:** Concrete; Steel; Life Cycle Assessment; Sustainable materials.

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## Guidelines for Integrating BIM Thinking Process into the Egyptian Design Studios in Architecture Schools

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Building Information Modelling (BIM) is now becoming a widespread all over the world. In Egypt, starting from the mid 2000's, BIM was introduced as a new technology that eases the opportunity of collaborating and sharing information through intelligent modelling in the Architectural, Engineering and Construction (AEC) industry. Going in depth into the Architectural design education in universities, undergraduate students lack understanding BIM knowledge, practice and process application throughout their academic years till graduation. Thus, this research aims to conclude guidelines for integrating BIM as a process into the design studios for the next architecture students' generation. These guidelines may enhance the architecture design process through BIM thinking process. Students would further graduate as BIM-Based to meet the career requirements needed after graduation. BIM and its process will be focused in an in-depth literature review in addition to discussing the traditional architecture design process in design studios. International case studies will address the universities' experiences upon BIM's integration in the design studios. Finally, questionnaires were held amongst students to identify their perception upon the integration of BIM as a process. To conclude, a comparison between both the traditional design process and the BIM process in design will be deducted to accomplish BIM integration guidelines into architecture the design studios.

**Keywords:** Building Information Modelling, BIM process, Architecture design process, Design studios, Egypt.

## Towards a Comprehensive Framework for Evaluating Sustainable Development in new Egyptian Cities Using GIS as a Tool

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The process of urban development is becoming more difficult because of the growing challenges that face the urban developers and negatively interfering with their success. For example, the shortage of resources, the environmental emissions that are responsible for environmental pollution, and the difficulty to deal with the effects that take place because of the climate change. Hence, urban planners are taking decisive actions to encourage the development of sustainable cities where they will be able to meet the economic, social and ecological challenges. Urban Planners and developers should evaluate the performance of a sustainable city. Life-cycle analysis (LCA), input-output analysis (IOA), carbon footprint (CF), ecological footprint (EF), ), cost benefit analysis (CBA) and Emergy Analysis (EA) are six methods used by planners to conduct such evaluation, but each one is used individually. This paper aims to set calculation criteria for the for mentioned evaluation methods based on Geographic information system (GIS) as advanced tool to set a pilot method that could be applied by planners for evaluating sustainable city development. The result sets an integrated scientific framework for the six evaluation methods divided into three main phases inclusive planning phase, towards low carbon phase, and final decision-making phase. The first phase considers the following evaluation methods EF, EA, CBA, IOA, and LCA. The second phase uses the following evaluation methods CF, IOA, and LCA. Finally, the third phase integrates the following evaluation methods CBA, CF, EF, EA.

**Keywords:** Sustainable City–Sustainable Development–Evaluation Methods–Integration– GIS.

## Implementation of Constructed Wetlands Landscape Design “A Resilient Application”

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Cities are centers of economic activities and opportunities, and according to recent United Nations' reports, half of the world's population are currently living in cities, resulting in a phenomenon often referred to as the “Urban Turn”. However, cities are also places that face accumulated stresses and sudden shocks, resulting in social, physical, or economic breakdowns. That is unless a city is resilient.

The concept of urban resilience has increasingly gained the interests of governments, urban designers, and various practitioners worldwide due to the unprecedented urbanization and the rising impacts of climate change, natural and man-made disasters, as well as other chronic stresses. As defined by the United Nations “resilience is the capacity of a certain system subjected to potential hazards or stresses to adapt, resist, or change in order to maintain its functions and structure, through learning from past experiences to inform future risk management measures”. Consequently, the main goal of resilient landscape is to prepare, retrofit, and adapt urban systems and communities to bounce back and recover more quickly from disruptive events and chronic stresses, either now or in the future.

Constructed wetland are considered an artificial mimic of natural wetlands, one of the most biologically diverse natural ecosystems which offer a number of resilient and sustainable functions, some of which are management of water flow of rivers, mitigation of floods, climate regulations, conservation of water sources, water purification, as well as maintaining biological diversity.

The main scope of this research is to study the potential benefits of constructed wetlands landscape design as a resilient approach to achieve water management, stormwater and flood control, improving water and air quality, in addition to aesthetic, recreational, and socio-economic functions.

**Keywords:** Resilience, Multifunction Landscape, Constructed Wetlands, Ecosystem Management.

## "Bringing a City Together"

### "Sociological Perspectives on Urban Resilience and Heritage Preservation"

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Within a drastic unstable global sphere, bringing a city together requires industrious efforts as cities were not born overnight. Every city has its own historical trajectories; so how to adapt to the global transformations without losing their identity, their history, and most importantly their social cohesion? Tackling these issues requires a solid case where urban resilience and heritage preservation efforts are visible for study. Alexandria City, as situated in the south, could provide different connotations and new solutions from a sociological point of view of some resilient urban system problems that may help answer the conference main question of: How the future city could be resilient? In this paper, the researcher examines Alexandria as a resilient city investigating whether it has managed to build a sense of belonging to people's spatial surroundings while pursuing sustainability or not. Theoretically, this paper derives its sociological analysis from Max Weber's theory on the city as appeared in his treatise in 1921 *Die Stadt: Eine Soziologische Untersuchung* (The City; a Sociological Study). The connection comes from putting Max Weber's Occidental City in parallel to the Contemporary Urban Alexandria, through juxtaposing the 5-Weberian features of the ancient and medieval city vis-à-vis the modern status quo of Alexandria City in Egypt. Methodologically, the researcher uses Ryo Terui & et al.'s model 'Visual Narratives of the Actantial Map,' known as the 'Actor- Networking Map,' in analyzing different public initiatives of heritage preservation and urban resilience. The paper tries to answer the following questions: How could different public initiatives represent a new form of urban resilience and a creation of bottom-up-sportive- cultural heritage? What are the Weberian features of the Ideal Type of the Occidental City that can be trailed to the contemporary urban-city of Alexandria? Based on Max Weber's perspective on the city along with Visual Narratives, the paper explores how the people of Alexandria use bottom-up-unique ways to claim their right to their own city and looks forward to ascertaining new theoretical insights within the discipline of urban sociology.

**Keywords:** The Right to the City, Urban Resilience, Heritage Preservation, Gated Communities, Alexandria.



## Integration of Energy Efficiency Measures and Renewable Energy Technologies as an Approach to Sustainable Development in Egypt

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Energy demand has been increasing worldwide and the building sector represents a large percentage of global Energy consumption. This is directly related to increasing global warming.

In Egypt, electricity consumption is increasing rapidly due to the rapid population growth, urbanization, economical development and increase in comfort levels. To solve the Energy problems, efforts need to be concentrated on the supply side, and the demand side as well. Energy efficiency is becoming an integral and important part of solving the Energy problem at the demand side. On the other hand, Renewable Energy technologies are promising as a solution at the supply side. Thus there is a need for integrated, adaptive, approach to reach the optimal combination of applying energy efficiency measures and Renewable Energy sources.

In this paper the energy related policies of Egypt have been presented. The present status of renewable energy utilization in Egypt has been discussed as well. The research introduces and examines the effect of combining Energy Efficiency measures with photovoltaic rooftop application in an air-conditioned office building in Egypt. Annual Energy reductions and Annual energy production due to the PV roof top installation was calculated by means of Energy Plus, a reliable Energy simulation software. The energy requirements for cooling, and lighting was evaluated as well.

It was proven that Reductions in Annual Energy Consumption reached about 48 % due to applying Energy Efficiency measures. The Annual electricity production due to the installation of 900 m<sup>2</sup> PV Panels on the building roof covered about 40% from the building Energy consumption. This demonstrates that it is technically possible to meet more than 60% reductions in building Energy consumption with the proper combination between Energy Efficiency measures and RE sources.

**Keywords:** Energy Efficiency, Renewable Energy, Building Integrated Photovoltaics.

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## Integration between Torrent Protection Gray Infrastructures with Constructed Wetland to Achieve Resilience in Ras Gharib

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Flooding and torrents are a seasonal phenomenon that hit a lot of cities every year around the world. As climate changes affect the world, cities are increasingly exposed to such threats especially those located on flood streams are most exposed to damages in the winter and the flooding season. In the past ten years, Egypt has been facing severe climate change effects like the increasing frequency of flooding in Egyptian cities. According to the Egyptian government, there are more than 1200 Egyptian cities and villages on flood streams and torrent tracks. These cities are distributed between the Mediterranean coast, Cairo region, Red Sea coast, Sinai and Upper Egypt, these and increasingly vulnerable towards the floods and their urban life is severely affected weather in old cities or in new planned cities. It is mostly located in the Eastern Desert at the east of the Nile. According to geologists and Meteorologists, these cities and their inhabitants are facing future hazards if they were not well prepared to handle floods. The international experience in constructed wetland projects proved to be a successful technique maintaining floods and turning it into sources of development and increasing biodiversity. Several countries led by China have developed national strategies to use wetland parks as a defense tool against flood risks, at the same time these parks have become a source of income for their cities. This paper is a part of series of papers and researches for constructed wetland technology and opportunities to use it in Egypt.

In this paper, the torrents and flood risks facing Ras Gharib city will be highlighted. Explaining the abilities of constructed wetland parks to minimize the damage and transform it into a source of strength, which will be a part of resilience city new policies. The research method is a comparative analysis between international project strategies and the Egyptian current strategies and actions to face flood and torrent risk. It will be the fundamentals of an Egyptian model that is compatible with the city's risks and challenges.

**Keywords:** Constructed Wetland–Infrastructure – Torrents – Flooding

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## القيم المضافة في نهج التحول لمدن مرنة استراتيجية التصدي للمخاطر المحتملة من فيضانات الأودية في مدينة الرياض نموذجاً

أحمد عبد الكريم أحمد سليمان

أستاذ مشارك – جامعة الإمام محمد بن سعود الإسلامية

هذه محاولة بحثية، تهدف لتحليل القيم التخطيطية، المنبثقة عن تحولات فكر التخطيط الحضري، في عصر حتمية التنمية المستدامة، والتي تستجيب لنهج التحول نحو المدن المرنة، من حيث المواصفات والخصائص العمرانية المتلائمة مع طرائق التصدي للمخاطر والمهددات الحضرية المختلفة. وتأخذ الدراسة مدينة الرياض، عاصمة المملكة العربية السعودية، إطاراً تطبيقياً لها، وذلك عبر تناول الخطط والبرامج المرتبطة بالتصدي للمخاطر المحتملة، نتيجة الفيضانات السيلية بأوديتها الرئيسية، وخاصة وادي حنيفة ووادي السلي.

تسعي هذه الدراسة لتحقيق عددٍ من الأهداف، وتتمثل في استعراض أبرز المفاهيم المتعلقة بوسم الورقة، وتحليل الوضع الراهن لمدينة الرياض، من منظور استراتيجي، لتشريح مكامن الفرص الاستراتيجية لنهج التحول نحو مدينة مرنة، واقتراح آليات عملية لتطبيق نهج المرونة التخطيطية في مدينة الرياض.

وقد أسفرت الدراسة عن عددٍ من النتائج التي كان من أبرزها:

- وجود نقاط قوة يمكن تعزيزها من أجل الرياض مدينة مرنة، منها توفر الأنظمة الجيومكانية، ومنظومات الأمن الحضري، والأمن السيبراني، وأنظمة الإنذار المبكر.
- وجود نقاط ضعف أساسية تعمل على عرقلة تحول الرياض لمدينة مرنة منها على سبيل المثال: عدم استكمال شبكات الصرف الصحي، وتدني جودة الهواء، وتزايد الانبعاثات الضارة بالبيئة.
- توفر فرص استراتيجية يمكن الانطلاق منها في نهج التحول للرياض كمدينة مرنة، ومن هذه الفرص: الإرادة السياسية، والتوجيهات الملكية لإنشاء الهيئة الملكية لمدينة الرياض، ووجود تسلسل هرمي لمستويات التخطيط المعمول بها، وتنويع الموارد المالية، والاستثمارات الذكية في البنية التحتية.
- ظهور قيم تخطيطية مضافة، ضمن تحليل نهج تحول الرياض لمدينة مرنة، مثل وجود خطط فعلية للتصدي للمخاطر الحضرية، وإصدار خطة إدارة مخاطر الفيضانات والسيول منذ عام 2015 م، وإضافة محور التغيير المناخي لخطة حماية البيئة (2015 - 2019).

الكلمات الدلالية: المدن المرنة، الفيضانات السيلية، التخطيط الحضري والاستدامة، الأنظمة الجيومكانية، مدينة الرياض.

## نحو تفعيل جودة الحياة من خلال مسارات الحركة غير الآلية

إيمان محمد هشام محمود السيد<sup>1</sup>، ياسمين محمد السمري<sup>2</sup>

<sup>1</sup> ماجستير العلوم في الهندسة المعمارية-الأكاديمية الحديثة للهندسة والتكنولوجيا، المقطم-الهضبة الوسطى، القاهرة، مصر  
<sup>2</sup> دكتوراه الفلسفة في الهندسة المعمارية-الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري، القرية الذكية، القاهرة، مصر

الإشكالية: تكمن المشكلة البحثية في عدم الاهتمام عند تصميم وتخطيط الشوارع بجودة حياة المستخدمين وتفضيل أهمية السيارات في الشارع على أهمية المستخدم له، مما ساعد في تدهور البيئة العمرانية في القاهرة والتي بحاجة ماسة لتحقيق جودة الحياة للسكان فيها .  
هدف البحث: دراسة العلاقة بين جودة مسارات الحركة غير الآلية وجودة الحياة للمستخدمين في المدينة .

وسائل البحث: يتم تحقيق الهدف من خلال دراسة النماذج الرائدة عالميا مثل (شارع ألين وباك)، والتطبيق على النماذج المحلية بالقاهرة الكبرى والتي انقسمت الى نماذج قائمة (شارع الشواربي) وتم تقييمهم بالاستبيانات للمستخدمين الزيارة الميدانية، والنماذج قيد الإنشاء (مسار غرب سوميد بمدينة السادس من أكتوبر) وتم ذكرهم كحالات قيد الإنشاء والتشغيل، والاستفادة من الدراسة التحليلية والتطبيقية للوصول الى المعايير التفصيلية الكاملة. بالإضافة إلى قياس المستوى المعيشي للمستخدمين والعمل على تلبية احتياجاتهم بسهولة ويسر، ويتم قياسها بناء على معايير مادية ومعنوية تؤثر بشكل مباشر على مؤشرات جودة الحياة لدى المستخدمين.  
نتائج البحث: تتلخص في أن مسارات الحركة غير الآلية لها أهمية كبيرة وقدرة عالية على جذب سكان المدينة وزوارها ورفع مستوى جودة الحياة لهم. وذلك لأنها تدعم الأمن والسلامة للمستخدمين وتدعم العملية الترفيهية وتلبية الاحتياجات وتعزز الصورة الجمالية والثقافية للنماذج القائمة، وقد أثبتت الدراسة التأثير الإيجابي لتلك النماذج على السكان والمستخدمين والمناطق المحيطة.

**الكلمات الدلالية:** ا جودة الحياة - مسارات الحركة غير الآلية - احتياجات المستخدمين في الشارع - الأمان في الشارع.

## دور المؤشرات في التخطيط الاستراتيجي لمرونة المدن دراسة حالة الأيزو (37120) – إطار تعزيز قدرة المدن على الصمود (ARUP)

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سعى البحث الى عرض المفاهيم المتعلقة بمرونة المدن، وتوضيح دور المؤشرات في التخطيط الاستراتيجي لمرونة المدن ، وكذلك شرح وتحليل تجربة الايزو 37120 في جودة الخدمات ونوعية الحياة ، والفوائد التي تعود على المدن من استخدام مؤشرات الايزو، وشرح نظام تعزيز قدرة المدن على المرونة ودراسة العلاقة بين مؤشرات الايزو واطار تعزيز قدرة المدن على المرونة ، ومدى ارتباطها بها في قياس اهدافها ، وقد خلص البحث الى اهمية المؤشرات كادوات رصد وتحليل للوضع الراهن وكاداة تحقيق المستهدفات ووضع مبادرات التطوير وكذلك كادوات متابعة وتقويم لكيفية تحقيق الاهداف ، كما اظهر البحث العلاقة بين مؤشرات الايزو واهميتها في تغطية كثير من اهداف مرونة المدن.

The research aimed to present concepts of city resilience, to clarify the role of indicators in strategic planning of city resilience, as well as to explain and analyze the iso 37120 experience in the quality of services and quality of life, the benefits to cities from the use of ISO indicators, and to explain the system of enhancing the resilience of cities And study the relationship between ISO indicators and the framework of strengthening the ability of cities to be flexible, and the extent to which they relate to them in measuring their objectives, the research concluded the importance of indicators as tools of monitoring and analysis of the current situation and as a tool to achieve targets and development initiatives as well as follow-up tools and evaluation of how to achieve the goals, as The research showed the relationship between ISO indicators and their importance in covering many of the objectives of city resilience.

## دور الدولة في وضع سياسات المرونة في مجال التخطيط العمراني

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اعتمدت الدولة في مصر علي وجود أجهزة تتولى صياغة إدارة السياسات بمختلف مجالاتها والتنسيق بينهما وفي وضع خطة عمل قومية لتنفيذ أنشطة الدولة وكذلك في إيجاد الإطار القانوني اللازم لوضع السياسات موضع التنفيذ ولأهمية دور الدولة في وضع سياسات المرونة التي هي موضع الاهتمام في عصرنا هذا فتوجه الدولة الاهتمام في صياغة السياسات التي تعكس رؤية الحكومة للمشكلة فيتم وضع خططاً لمواجهة وسائل تنفيذ لهذه الخطط. وتلقي الورقة البحثية الضوء على مفهوم المرونة ومحاولة الاستفادة من أجهزة الدولة والأجهزة البحثية والجهات التعليمية في تطوير المناطق عمرانياً وبيئياً بحيث تستوفي احتياجات السكان ومتطلباتهم وذلك بالارتقاء بالإيجابيات والتقليل من السلبيات. لذلك تهدف الورقة البحثية إلي التعرف على دور الدولة في صياغة سياسات المرونة خاصة في مجال التخطيط العمراني - التجمعات السكنية- وكذلك أفضل المداخل للتعامل مع المدن الجديدة من حيث :

- التعرف على خصائص التجمعات العمرانية وعوامل تشكيل ملامحها
  - دراسة التوجهات التنموية .
  - أهمية المرونة في تحديد شكل النسيج العمراني بالتجمع السكني
  - تشكيل و صياغة ملامح الحياة داخل التجمع السكني.
- وحيث أن الارتقاء والتجديد الحضري هو أحد الأهداف الرئيسية لمشروعات التنمية العمرانية فيتم اختيار نموذج لتجمع سكني و يتم دراستها من جميع الأوجه بحيث يتم الوصول الي الحلول التخطيطية و العمرانية البيئية واستخدام مبدأ المرونة في الحلول **Resilience** التي تؤدي إلي :
- الوصول الي منهج صياغة وتحليل السياسات والمشروعات والبرامج التنموية.
  - تحديد الأولويات وإدارة التنفيذ.
  - تحديد الأطر الرئيسية التي تحتاج إلي تطبيق مبدأ المرونة.
  - تحسين الصورة البصرية للفراغ العمراني بالتجمعات السكنية بتطبيق مبدأ المرونة..
  - تطوير البيئة الحضرية التي تتمثل في التشكيلات البنائية وتنسيق المواقع وتحسينها بتطبيق مبدأ المرونة .
  - المحافظة على الطابع الحضري بتطبيق مبدأ المرونة
  - وضع سياسة لأسلوب التعامل بما يتناسب مع القيمة الحضرية للمكان و بما يحقق استدامة المكان
  - المحافظة على الطابع الحضري وحماية الآثار الموجودة
- الكلمات المفتاحية: المرونة-المدن المرنة -الشكل الحضري المرن -الارتقاء -التجمعات السكنية

## رصد وتحليل المنظومة الذكية لعمارة الروضة الشريفة

شيماء عبد المجيد عبد المجيد إبراهيم

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أستاذ مساعد بقسم التصميم الداخلي – كلية علوم الأسرة – جامعة طيبة – السعودية

يمثل المسجد النبوي الشريف علامة بارزة في تاريخ الحضارة والعمارة الإسلامية عامة وعمارة المساجد والمسجد النبوي خاصة، ويعد المسجد النبوي ثاني المساجد الثلاثة التي تشد إليها الرحال والصلاة فيه أفضل من ألف صلاة فيما سواه إلا المسجد الحرام صدق الرسول صلى الله عليه وسلم، فهو محط آمال تهفو إليه قلوب المسلمين وتتجه إليه أفئدتهم من كل حذب وصوب رغبه في الأجر وطمعا في الثواب.

ومن هنا صارت الحاجة ماسة لإنشاء دراسة تختص بهذا التراث لتجمعه وتدرسه وتقديمه للأجيال الحاضرة والقادمة خدمه لمدينة رسول الله صلى الله عليه وسلم خاصة والتراث والثقافة عامه، وربط النتاج المعماري المعاصر للمسجد النبوي بالقيم الجمالية والمعمارية والعمرانية التراثية .

ويشهد المسجد النبوي الشريف خلال المواسم كثافة عالية من المصلين ويمتلئ المسجد والساحات المحيطة به بالمصلين ويلاحظ أنه في أوقات الذروة تشهد مصليات النساء وخاصة القسم الواقع في الجهة الشمالية الشرقية للمسجد كثافة عالية تزيد عن استيعابيته المحددة لتمييزه بإمكانية الزيارة والصلاة في الروضة النبوية الشريفة من خلاله في الأوقات المخصصة لذلك، مما يسبب الزحام الشديد ويؤثر على أمن وسلامة المصليات والزائرات من النساء.

ومن خلال الدراسة البحثية والتطبيقية حول العملية التصميمية لدخول الروضة الشريفة في ظل رؤية عام 2030م، والتي يصل عدد المعتمرين والحجاج والزوار إلى ما يزيد عن 30 مليون شخص .

ظهرت الحاجة إلى تطوير حلول ومقترحات تلبي احتياجات العصر المتزايدة يوما بعد يوم ويلبي جميع المتطلبات والتوقعات المستقبلية، ولا تؤثر على الهوية التراثية التي ارتسمت في وجدان الزوار، وذلك بتنظيم الحشود والحركة في الروضة الشريفة من خلال استخدام التقنيات والتطبيقات الحديثة، لتسهيل الوصول للروضة الشريفة وسهولة أداء الزيارة النبوية في أمن وطمأنينة في العبادة.

**الكلمات الدلالية:** العمارة الإسلامية - الهوية التراثية - العمارة المعاصرة - التراث الإسلامي - التكنولوجيا الحديثة.



## التصميم العمراني المستدام كمدخل لمرونة مدن المستقبل

فرج محمد زكي عبد النبي

مدرس بقسم الهندسة المعمارية- كلية الهندسة بالمطرية- جامعة حلوان- مصر  
معار الى قسم العمارة الإسلامية-كلية الهندسة والعمارة الإسلامية-جامعة ام القرى-السعودية

أصبحت الأزمات ذات صفة طبيعية في المدن خلال القرن الحادي والعشرين، بسبب التغير المناخي والاقتصادي والاجتماعي، حيث تواجه المدن العديد من المشكلات العمرانية، لا تتنبأ المدن بالإشكاليات القادمة ولكن يمكن أن تخطط لمعالجتها، اي تحقيق المرونة بالاستعداد والقدرة على تبني استراتيجيات بديلة كالاستجابة للظروف المتغيرة والأزمات المفاجئة، والتكيف بشكل إيجابي والتحول للاستدامة، من خلال أنظمة أكثر مرونة وطرق بديلة لاستخدام الموارد في أوقات الأزمات، كما تخضع المدن للتصميم العمراني المستدام المرن استعداداً لعدد من القضايا (العمرانية والاجتماعية والاقتصادية والبيئية) وفق رؤية مستقبلية مستدامة، ويهدف البحث الي تطبيق نظريات الاستدامة والمرونة في التصميم العمراني للمدن لإدارة وتشغيل المجتمعات الحضرية، من خلال مبادئ صديقة للبيئة حتي تكون مرنة في التصميم ولكي يضمن التصميم العمراني المستدام توفير احتياجات المدن من مياه وكهرباء وغذاء لجميع أجزائها، وتحقيق مبادئ الاستدامة ذو الإطار الصفري، عن طريق التصميم مع الطبيعة وربط وجود الأماكن المفتوحة كالحديقة والمتنزهات، والإنتاج الغذائي المستدام، ويخلص البحث إلى طرح استراتيجية جديدة لتلبية احتياجات التحضر في القرن الحادي والعشرين، لتصبح مرنة صالحة للعيش، حاضنة للجميع، آمنة وقادرة على الصمود لتحقيق مدن مستقبلية مستدامة، وسعيًا للوصول الى تحقيق اهداف البحث يعتمد على بعض المناهج منها المنهج الوصفي الذي يقوم على جمع المعلومات وإلقاء الضوء على الخلفيات النظرية، كالمنهج التحليلي الاستنباطي وذلك لتحليل المعلومات المستنتجة من الدراسة النظرية والتحليلية، واستنباط الأسس والمعايير والمبادئ العلمية، والمنهج التحليلي المقارن وذلك بهدف رصد وتحليل عينات الدراسة، وباستخدام التحليل الإحصائي يتم استخراج النتائج وتوضيحها بيانياً بطريقة الأعمدة.

**الكلمات الدلالية:** التصميم المستدام - المدن المرنة - المجتمعات الحضرية - العولمة - التحضر.

## نحو مجتمعات عمرانية مرنة لإعادة توطين سكان المناطق العشوائية

محمد هشام سعودي<sup>أ</sup> محمد أحمد فؤاد مهدي<sup>أ</sup>، إسرائ سمير عبد الله<sup>ب</sup>،

<sup>أ</sup> قسم العمارة، كلية الفنون الجميلة، جامعة الإسكندرية، مصر

<sup>ب</sup> قسم العمارة، المعهد العالي للهندسة والتكنولوجيا، مصر

تركز الورقة الحثية على تحقيق الاستدامة والمرونة للمجتمعات العمرانية الجديدة التي يتم بنائها من قبل الدولة لإعادة توطين سكان المناطق العشوائية الغير آمنة، وذلك بالقدرة على مواكبة التغييرات الطبيعية او البشرية التي يمكن ان تواجهها تلك المجتمعات حتى لا تتحول الي مناطق عشوائية لتلبية احتياجات السكان ومتطلباتهم المصاحبة للتغيير في الحياه السياسية والاقتصادية والاجتماعية، تمت تلك الدراسة من خلال دراسة التأثيرات الاقتصادية والاجتماعية المصاحبة لإعادة توطين سكان المناطق الغير آمنة الى حي الأسمرات بالقاهرة، ويصل البحث الى تحديد نقاط القوة ونقاط القصور لتلك المشروعات والوقوف على المشكلات المصاحبة لعمليات إعادة التوطين والمشكلات القائمة من بداية تصميم المشروع، حتي يصل الى مقترح تحسين جودة الحياة البشرية بتلك المجتمعات الجديدة من اجل تحقيق الاستدامة والمرونة بها باستخدام الموارد المتاحة.

**الكلمات المفتاحية:** المجتمعات المرنة - **Slum Relocation** - إعادة التوطين - **Informal Settlements Resettlement**

## دراسة تحليلية لقانون التصالح فى بعض مخالفات البناء

أ.م.د / ريهام محمد على حافظ<sup>أ</sup>

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عانت المدن والقرى المصرية من الضغوط البشرية على هياكلها العمرانية و هويتها عبر الزمان ، فقد تعرضت لعمليات واسعة من النمو والتوسع الحضري بالإضافة الى التكتيف العمرانى الشديد في الكثير من أرجائها وهو ما أوجد تشوهات بصرية ووظيفية تشكلات مختلفة من مخالفات البناء والتي ، وتنوعت ما بين مجرد عدة أمتار زائدة إلى ان وصلت أحياء وأشباه مدن كاملة و أصبحت كتل سكنية مكدسة خارج المنظومة التشريعية والقانونية للعمران - تعاني أغلبها من ارتفاع شديد في الكثافات السكانية والبنائية وقصور في كفاءة المرافق والطرق والخدمات- مما يجعل من الصعب التعامل معها بأى أشكال من الارتقاء أو إعادة التخطيط الحضري – ولكنها في ذات الوقت وفرت الأف من الوحدات السكنية لبعض الفئات و أصبحت جزء من الرصيد السكنى يصعب إهماله - وهو ما دفع الحكومة المصرية لسن قانون استثنائي للتصالح في بعض مخالفات البناء رقم (17) لسنة 2019 كنوع من محاولات التكتيف مع الأزمات الاقتصادية وتقنين الأوضاع المخالفة و استيعاب العمران القائم بما له وما عليه والذي يخل بأغلب قوانين البناء والتخطيط العمرانى .

ويتناول البحث الدراسة في ثلاث نقاط رئيسية كالتالي:

- الدراسة النظرية للخلفية التاريخية لقوانين التعامل مع مخالفات المباني .
- الدراسة التحليلية لقانون لتصالح مع بعض مخالفات المباني كقانون استثنائي والمشكلات التي تواجه تطبيقه بوجه عام.
- منهجية تحديد مقابل التصالح للمدن والقرى .

استبيان لاستطلاع آراء المتخصصين حول القانون واليه تطبيقه واستنتاج الخلاصة والتوصيات.

**الكلمات المفتاحية:** قانون التصالح – مخالفات المباني – مقابل التصالح – التقنين.

- قياس النسبة المئوية لدرجة تحقق كل مخرج من مخرجات التعلم المستهدفة بالمقرر الدراسي، مع توضيح مدى ملائمة كل طريقة من طرق التقييم المختلفة لقياس درجة تحقق كل مخرج تعليمي مستهدف للمقرر.
- تعتبر مؤشر قوى على تحقق أهداف البرنامج الأكاديمي وكفاءة أداء أعضاء هيئة التدريس والهيئة المعاونة في تدريس المقرر وإكساب الطلاب لمخرجات التعلم المستهدفة بالمقرر.
- تهيئة وإعداد الجامعات المصرية للتقويم الخارجي، ومن ثم للاعتماد على كافة المستويات.

### توصل الباحث إلى مجموعة من النتائج من أهمها ما يلي :

- أهمية تحقق مخرجات التعلم المستهدفة بالمقرر فى التقويم الذاتى للبرنامج الأكاديمي وتأثيرها المباشر على تحقيق أهداف البرنامج الأكاديمي.
- أهمية قياس النسبة المئوية لدرجة تحقق كل مخرج من مخرجات التعلم المستهدفة بالمقرر الدراسي كدليل على اكتساب الطلاب لمخرجات التعلم المستهدفة والمساعدة فى عملية تقويم المقررات من حيث توضيح نقاط القوة والضعف فى تحقيق المخرجات المستهدفة بها ومن ثم إعداد خطط التطوير والتحسين والتعزيز.
- أهمية ربط مخرجات التعلم للمقررات الدراسية بمخرجات التعلم للبرنامج الدراسي لتوضيح كيفية تكامل كل المقررات معاً فى عملية دعم وتحقيق وتقييم كل مخرج من مخرجات التعلم المستهدفة للبرنامج ككل، ووضع تفاصيل ذلك الارتباط على المستوى الفردى لكل مقرر لتوضيح أهمية المقرر الدراسي فى دعم وتحقيق وتقييم أحد أو بعض مخرجات التعلم المستهدفة من البرنامج.
- وضع مقترح آلية تتسم بالمرونة لتأكيد وقياس النسبة المئوية لدرجة تحقق كل مخرج من مخرجات التعلم المستهدفة بالمقرر الدراسي، وتكمن أهمية تحقق مخرجات التعلم المستهدفة بالمقرر فى عملية التقويم الذاتى للبرنامج الأكاديمي ومدى تحقق أهدافه، وعملية تقويم الذاتى للمقررات وإعداد خطط التطوير والتحسين والتعزيز.

### كما يتقدم الباحث بمجموعة من التوصيات من أهمها ما يلي:

- يوصى الباحث بضرورة وضع مقترح آلية أخرى تقوم بعملية التقويم الذاتى للبرنامج الأكاديمي وقياس مدى تحقق أهدافه، وتحقيق التكامل مع نتائج الآلية المقدمة بالبحث.
- قيام الهيئة القومية لضمان جودة التعليم والاعتماد بدورها فى اعتماد وتعميم تطبيق الآلية المقترحة بالبحث كآلية من آليات التقويم الذاتى.
- قيام الهيئة القومية لضمان جودة التعليم والاعتماد بتنظيم دورات تدريبية تختص بتوضيح كيفية عمل تلك الآلية.
- الإشراف المباشر من قبل الهيئة على كل مؤسسة من مؤسسات التعليم العالى لضمان سير العملية التعليمية بها وفق آليات وضوابط جودة الأداء الإدارى والأكاديمي حتى حصولها على اعتماد الجودة، وتمكينها من الإدارة الذاتية لعملية التقويم بعد توصلها لمفاتيح جودة الأداء إدارياً وتعليمياً.

**الكلمات المفتاحية:** التقويم الذاتى – مخرجات التعلم المستهدفة – تقويم المقررات – آليات القياس – الجودة الشاملة.

## " المرونة في تطوير آليات جودة إدارة التقويم الذاتي في الجامعات المصرية" نحو آلية لتأكيد وقياس درجة تحقق مخرجات التعلم المستهدفة بالمقرر الدراسي

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توضح الورقة البحثية أهمية المرونة والاستمرارية في تطوير آليات جودة إدارة التقويم الذاتي في الجامعات المصرية، وتقدم مقترح آلية لتأكيد وقياس النسبة المئوية لدرجة تحقق كل مخرج من مخرجات التعلم المستهدفة بالمقرر الدراسي، وتكمن أهمية تحقق مخرجات التعلم المستهدفة بالمقرر في التقويم الذاتي للبرنامج الأكاديمي في تأثيرها المباشر على تحقيق أحد أهداف البرنامج الأكاديمي وهو إكساب الطلاب مخرجات التعلم المستهدفة من البرنامج، حيث أصبح التقويم الذاتي من أهم العناصر الفاعلة والمؤثرة في جودة التعليم ونجاح العملية التعليمية اللذان يعتمدان على العديد من المحاور الرئيسية المؤثرة مثل تطوير وزيادة فعالية التدريس والتعلم وتطوير عمليات اختيار أعضاء هيئة التدريس والباحثين والاهتمام بموضوعات البحث العلمي والتواصل مع سوق العمل لتلبية احتياجات المجتمع وأولوياته.

وتكمن أهمية المرونة في تصميم وتطوير نظام إدارة التقويم الذاتي والجودة الشاملة في توفير آلية تمكن الجامعات المصرية من تحقيق الأداء المتميز في تقديم الخدمة التعليمية، كما أن إدارة الجودة الشاملة من الأمور اللازمة والضرورية المؤثرة على استمرار المؤسسات التعليمية، وبقائها في عصر التقنيات.

وتتعرض الورقة البحثية للمبادئ التي تركز عليها عملية إدارة الجودة الشاملة والأساليب المتبعة في تطبيق جودة الأداء والتقويم الذاتي في الجامعات المصرية بهدف التوصل إلى وضع آلية تساعد في عملية التقويم الذاتي للمقررات وتأثير ذلك على البرامج الأكاديمية، وكيفية تطبيق تلك الآلية في الجامعات المصرية.

### أهداف البحث

الهدف الرئيسي من الورقة البحثية هو وضع آلية تتسم بالمرونة لتطوير نظام الجودة الشاملة لإدارة التقويم الذاتي من خلال تقديم مقترح آلية لتأكيد وقياس النسبة المئوية لدرجة تحقق كل مخرج من مخرجات التعلم المستهدفة بالمقرر الدراسي، هذه الآلية تتكامل مع دور الهيئة القومية لضمان جودة التعليم والاعتماد ودور الجامعات المصرية، والهدف من استخدام وتطبيق هذه الآلية بالجامعات المصرية تحقيق ما يلي:

- دعم وتحقيق وتقييم كل مخرج من مخرجات التعلم المستهدفة للمقرر الدراسي.
- الكشف عن جوانب القوة ونقاط الضعف في البرنامج التعليمي حتى يتم وضع خطط التحسين اللازمة.

## نحو تدشين منصة معلومات عمرانية لإدارة المدن المصرية من خلال تحليل تجربة دولة كوريا الجنوبية

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ظهر مفهوم التحول الرقمي في الآونة الأخيرة كأحد الانظمة الأساسية التي تبنتها الحكومات المختلفة لتحسين جودة الحياة وتقديم الخدمات لمواطنيها بشكل ميسر، وقد تم تعريف التحول الرقمي بأنه دمج التكنولوجيا الرقمية في جميع مجالات الأعمال والإدارة وتقديم الخدمات الحياتية، وأصبح أحد اليات إدارة المدن وتسارعت الحكومات والبلديات في تدشين المنصات الإلكترونية كأحد الركائز الأساسية للمدن الذكية. وبعد قطاع التنمية العمرانية والعقارية من أهم القطاعات المؤثرة لتحقيق التنمية الحضرية المستدامة ، وهو ما يحتم وجود سياسات واستراتيجيات و أنظمة تتيح الإدارة الفعالة للمدن .

وتمثل المدن المصرية منظومة عمرانية متسلسلة شهدت حضارات وتراث الأمم ومررت بكافة الثقافات والأنظمة والأحداث المتعاقبة مما أنتج منظومة عمرانية متشابكة الأطراف و ميراث عقارى متعدد المعالم والخصائص . وقد أولت الحكومة المصرية كافة منظومات التنمية العمرانية والعقارية اهتماما كبيرا

على مستوى التنمية العمرانية : تم سن وتعديل العديد من القوانين ثم الاهتمام بإعداد المخططات الهيكلية والتفصيلية للكثير من المدن والقرى وإعداد الكودات الفنية المختلفة فى كافة أوجه البناء الفنية.

على مستوى التنمية العقارية: تسعى الحكومة إلى إعادة هيكلة القطاع العقارى باختلاف مجالاته وصاحب ذلك الكثير من الجهود فى حصر الثروة العقارية بالتعداد المصرى 2017، وسن قانون الضرائب العقارية.

و قد أسهمت كافة الجهود السابقة فى تجميع قاعدة البيانات الخاصة بالثروة العمرانية والعقارية لكن دون تكامل وترابط وهو ما يحتم ضرورة استجابة المدن المصرية للتطور و الأنظمة التكنولوجية الحديثة للسيطرة على الهياكل العمرانية والعقارية للمدن - وهو ما حدد رؤية هذه الورقة البحثية فى اقتراح و صياغة منظومة تكنولوجية متكاملة قادرة على استيعاب كافة المتغيرات بالاستعانة بتجربة دولة كوريا الجنوبية كأحد التجارب الرائدة فى مجال تدشين البنية المؤسسية الإلكترونية - وذلك استكمالاً وتوئجا للجهود السابقة حتى تؤتى ثمارها ، وتعمل على إرساء السياسات والانظمة المبتكرة لتعزيز الاستدامة فى التخطيط الحضرى و التطوير العمرانى وتسهم فى زيادة كفاءة إدارة الأصول الحكومية و تيسير الخدمات العقارية.

**الكلمات المفتاحية:** التحول الرقمي - التكنولوجيا - منصة معلومات عمرانية - إدارة المدن - تجربة كوريا الجنوبية

## توظيف الوسائط الحاسوبية الذكية في دعم إدارة العمران

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بعد الزحف العمراني وخاصة النمو على أطراف المدن وبمحازاة الطرق السريعة من أبرز سمات التوسع العمراني في المدن المصرية. وتتمثل أهم سمات هذا الزحف العمراني في قصور التخطيط، واختلال التوازن في أنماط وخصائص النمو، وعدم كفاية الخدمات أو حسن توظيفها وكذلك القصور الشديد في إدارة العمران وخاصة تخطيط عمليات التوسع العمراني والتي تشمل تحديد أنماط التوسع ومسبباته وربط ذلك بسياسات التوسع العمراني وسبل تنفيذها. ونظراً لأن عملية إدارة العمران تعتمد بشكل أساسي على حداثة وموثوقية البيانات المكانية وغير المكانية وكفاءة تحليلها والإستنتاج المفيد منها، فإنه يمكن توظيف التقنيات الحاسوبية المتقدمة وخاصة الوسائط الذكية في التغلب على هذه الفجوة والمساهمة في رفع كفاءة إدارة العمران بالمدن المصرية. ولمحولة الإرتقاء بإدارة العمران وخاصة إدارة التوسع العمراني في مصر، فإن هذا البحث يهدف إلى تحليل دور تقنية المعلومات والاتصالات بوجه عام، والوسائط الحاسوبية الذكية بوجه خاص في توفير المعرفة اللازمة ودعم صناع ومتخذي القرار في رفع كفاءة إدارة العمران، مع تقديم نماذج عملية لتوظيف الوسائط الحاسوبية الذكية وبيان دورها في الإرتقاء بإدارة التوسع العمراني بالمدينة، ودعم الإدارة الفاعلة والتفاعلية لعمليات تخطيط التوسع العمراني بالمدينة. وتتمثل سمات الوسائط الحاسوبية الذكية في كفاءة وعمق التحليل بناءً على أنماط الزحف والتوسعات العمرانية السابقة وإستقراء الأنماط المستقبلية مع تقديم أفضل البدائل للنمو العمراني والسبل المثلى لإدارته مع الأخذ في الإعتبارات الإستراتيجية والتنظيمية والمخططات الهيكلية والمقومات الإقتصادية والسمات والسلوكيات الإجتماعية للسكان.

ويخلص البحث إلى أن توظيف الوسائط الحاسوبية الذكية سيساهم بشكل كبير في الإرتقاء بإدارة التوسع العمراني في المدينة وذلك من خلال تحديد أنماط التوسع وإستنباط المسببات التي تفرز وتشكل تلك الأنماط وتحديد أفضل السبل لمجابهتها، مع تفهم وعرض وتحليل نتائج تطبيق السياسات والتوسعات العمرانية بالمدينة. وتساهم كذلك في تحليل أنماط وخصائص النمو العمراني مما سيدعم المخططين ومتخذي القرارات الخاصة بالتنمية والإدارة العمرانية للمدينة في رفع كفاءة إدارة العمران.

**الكلمات المفتاحية:** إدارة التوسع العمراني، التقنيات الحاسوبية الحديثة، إدارة العمران، الوسائط الحاسوبية الذكية

## تكامل التصميم المستدام للحيزات العامة مع تقنيات التفاعل الرقمي وتطبيقاتها بمدينة الإسكندرية

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ان التوجهات التصميمية الحديثة أصبحت بلورة لآطار النظرى التفصيلى للإبداع وتمثلت في التقدم في تقنيات الانظمة التفاعلية لتواكب المتطلبات والإحتياجات البيئية في ظل الثورة الرقمية، ولقد شكل هذا الأساس الإحتياج السعي لدراسة تصميم الأماكن العامة وما تتضمنه من تصميم حيزات الاستراحات الخارجية باعتماد علاقة جانبيين أساسيين هما الجانب الإبداعي في التصميم والجانب التطبيقي المعتمد على التكنولوجيا الرقمية التفاعلية للوصول الى تصاميم أكثر ابداعاً".  
و يهدف هذا البحث الى تعريف الأسس العامة للتصميم التفاعلي الذكي الإبداعي وعلاقته بتحقيق الاستدامة البيئية وكيفية توظيف التكنولوجيا و فاعليتها في تحقيق التكامل بين التصميم و مستخدميه بشكل يتسم بالمرونة و القابلية التفاعلية لخلق فراغ ديناميكي تفاعلي.

بالإضافة الى دمج آليات النظام الحركى التفاعلي لخلق تكوينات تصميمية ابداعية متطورة مغيرة بذلك النمط التقليدى في التصميم واستخدام تكنولوجيا الخامات الحديثة و تنفيذها باستخدام الحاسب الالى و التقنيات التكنولوجية الرقمية ، و تتعرض الدراسة لمجموعة من النماذج التوضيحية كتطبيقات لهذه التكنولوجيا الرقمية التفاعلية في التصميم الحضري لمدينة الإسكندرية ويختتم البحث بالاجراءات التطبيقية وصولاً الى استخلاص و عرض النتائج و التوصيات النهائية.

ويتم تناول مشكلة البحث حيث القاء الضوء على مشكلات التصميم في الحيزات العامة حيث تحدث الكثير من التغييرات فى الفراغات و البنية الهيكلية المعمارية و نظم اتصالها مع المتلقى. انعكست تلك التطورات فى ظل النظم التكنولوجية المتقدمة فى التصميم و التنفيذ على تغيير تصميم الحيزات العامة مثل محطات الانتظار وبالتالي كانت المشكله الرئيسيه هى الرتابة والجمود التي تظهر بشكل ثابت من الناحية التصميمية والوظيفية .

يعد أهمية البحث خطوة نحو دراسة تطبيقات التكنولوجيا الرقمية التفاعلية فى تصميم حيزات عامة مستدامة لانتاج انماط شكلية وظيفية و التعبير عن هوية الفراغ باستخدام التكنولوجيا الرقمية و الفكر التفاعلي و توظيفها لتقديم حلول ابداعية لحل المشاكل التصميمية المختلفة و التنوع فى الخامات و النظم التكنولوجية الذى يتناسب مع احتياجات الفراغ .

يعتمد البحث بشكل اساسى على تقديم حلول ابتكارية والاتجاهات تصميمية و وظيفية لحيزات العامة و لذلك فهو يهدف للتعرف على النظم التكنولوجية المتقدمة فى التصميم و آليات التنفيذ الرقمية التفاعلية و دراسة مدى فاعليتها فى تحقيق التكامل بين آليات الفراغ و مستخدميه بشكل يتسم بالمرونة و القابلية التفاعلية لخلق تصميمات ابتكارية ذكية.

**الكلمات المفتاحية:** الاستدامة, التصميم الحضري , التكنولوجيا الرقمية , التفاعلية , النظام الحركى التفاعلي



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## مقدمة

أصبحت الأزمات صفة طبيعية للمدن خلال القرن الحادي والعشرين. وذلك لان معظم المدن عرضة للعديد من التأثيرات الناتجة عن التعرض للضغوط والمخاطر الطبيعية أو البشرية مثل التغيرات المناخية والتوسع الحضري وعدم الاستقرار الاقتصادي. ومن هنا نشأت فكرة المدن المرنة والتي يقصد بها قدرة النظم الحضرية على الحفاظ على الاستمرارية عند التعرض لأي ضغوط أو مخاطر مع قدرتها على التكيف الإيجابي والتحول نحو الاستدامة. فى المدينة المرنة يتم تقييم جميع الخطط والمخططات والاستراتيجيات وذلك عن طريق الاستعداد لاستيعاب جميع المخاطر والاستجابة لها وسبل التعافي منها؛ سواء بشكل فجائى أو متدرج. متوقع أو غير متوقع مع الحفاظ على وظائفها وهيكلها وهويتها الأساسية والتكيف مع التغييرات المستمرة.

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**ICPCR 2020**

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