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Redefining the Role of an Architect in the Contemporary Context

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Abstract. Architecture should be understood as a logical, rational and appropriate response in a particular context. Any architectural output has to be perceived as being the product of a particular place, at a particular time and for a particular reason. The advent of cutting edge research and the resultant emerging technologies have affected and dictated the current architectural outputs. Today architects design irrespective of climate and geography. All the gaps are filled in by technology which comes with a huge cost to the environment. Architects have a key role to play in achieving the fine balance between human need and sustainability.

Keywords. :**Research, Environment, Architectural outputs, Sustainability, Appropriate Technology and Human needs.**

Introduction.

Architecture should be understood as a logical, rational and appropriate response in a particular context. Any architectural output has to be perceived as being the product of a particular place, at a particular time and for a particular reason. Scale, proportion, pattern, balance and rhythm are among the basic leitmotif of any architectural design. The advent of cutting edge research and the resultant emerging technologies have affected and dictated the current architectural outputs. Today architects design irrespective of user needs, climate and geography. All the gaps are filled in by technology. This treatise argues that although these technologies are a manifestation of the extent of ingenuity of the human mind yet they come with a huge cost to the environment. Ever since the emergence of these technologies the environmental degradation has been exponential. Architects have a key role to play in achieving the fine balance between human need and sustainability .The way forward is appropriate technology and architects need to understand and define the technologies needed. An architect has to reverse his role from being an artist with a technical aptitude to being a technician with artistic skills. The various ways in which the architect of the future has to adapt is discussed and enumerated.

The world today is of technology, by technology and of technology. The human race is willing to change to adapt and adopt to these technologies. They feel that it can be harnessed, processed and harvested to enhance their comfort levels. The fact which is conveniently overlooked and/or ignored is that these technologies have a huge environmental footprint and consume very vital resources. As these technologies get obsolete very rapidly they significantly contribute to the generation of electronic waste which is not easy to handle. As the human race becomes more inured towards this trend there is real danger of them losing their identity.

Technology is here to stay and so is the human desire to exploit it. Architects today have to first understand the finer aspects of the technology available and then define the kind of technologies desirable. Ideating is the key here.

Today the architect has to be a jack of all trades but master of none. The architect has to be someone who is aware of the latest research and technologies available, understand its finer nuances and intelligently use and exploit them in his designs. Technology enables an architect to directly conceive in the third dimension and also virtually simulate his designs to test their efficacy.

A tremendous stride in printing technology means that the day is not far off when an entire building and/or components of a building can be printed on site-very much like PCB (printed circuit boards) in electronics.

There are several other technologies which are not very far away from becoming a reality-it's only a matter of time.

1. Memory materials – materials which can retract and regain their original form.
2. Vitricity-virtual electricity –which means that electric current can be transmitted like wi-fi.(wireless fidelity)
3. Urinicity-electricity from urine.
4. Piezo electricity and so on.

Materials and methodology.

The basic changes in the professional setup have to happen from the architectural education pattern itself. Some of the suggested interventions are

1. A thorough background in computer science, software and building physics is necessary.
2. Environmental engineering along with environmental science should be a part of the curriculum.

The very basic design approach has to change –design philosophy should be outside-in and not inside-out. In modern times everything from the F-16 warplane to the Burj-Al-Khalifa has been designed outside-in. The form of a building shall be dictated entirely on environmental considerations and the function shall be adjusted accordingly to ensure that the bio-cost of the building is within acceptable limits. Some basic guidelines for the same are enumerated and presented.

1. Building designs can also be very precise and exacting. Technology available today can enable this.
2. A building does not just have a system. It is a combination of various systems. Technology can be harnessed to ensure that these systems seamlessly amalgamate with each other.
3. Spatial and temporal analysis of the various spaces in a building to be done. Spatial analysis would broadly deal with the functions of the various spaces and their requisite thermal comfort while temporal analysis will examine at what

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times of the day and/or night these are sought to be achieved. Spaces can then be accordingly used as dexterous, multifunctional and multiuse entities.

4. A complete LCA (life cycle analysis) of the proposed build to be carried out. This can be carried out by simulation. The complete energy and water footprint of the proposed structure right conception onto construction on to completion, commission and after use to be evaluated. Based on this evaluation the need for various spaces in the building and/or the building itself can be assessed.

5. The building has to be designed as a zero energy building –a building which generates as much energy as it consumes. Passive strategies to play a key role in the overall building design. Active interventions should be kept to a bare minimum.

6. The footprint of the building should be kept low. This minimum intervention on the ground is necessary to ensure that ecosystems are not disturbed. Also the total load of the building on the ground to be kept low. This is to ensure that ecosystems in on the ground, in the ground and below the ground are not affected. The various options for ensuring this are-

a. The structure can be on stilts.
b. The structure can be a pneumatic structure.
c. It can be a shell structure.
d. It can be a self supporting frame.
e. It can be a geodesic dome.
f. Any other allied systems.

The very design of the structure should be such that all the moments are arrested within the structural framework itself and the transfer of load to the ground should be minimal.

7. The façade of the building presents the maximum possible surface area which in turn governs the thermal comfort inside the building. The climate of a location may be constant but the weather patterns are unpredictable and keep changing constantly. The façade therefore has to be designed as an evolving and revolving façade. Other interventions for façade should be

a. The façade should act as a bio-filter.
b. It should be the medium to harness renewable energies.
c. It should aid in decomposition of waste.
d. It should enable rain water harvesting.
e. It should also enable water harnessing and harvesting from the air.
f. It should ensure that all daytime requirements of light and ventilation should happen without active interventions.
g. All night time lighting requirements should be met by bio-luminescence

8. The other area which requires special intervention is the internal spaces.

a. All floors can be revolving to adjust to climate patterns.
b. All floors should be designed purely as floor plates. Interior design will handle the various functions and activities of the space.
c. All floors should be capable of generating peizo electricity.
d. All the human waste should be decomposed and recycled at the floor level itself.
e. Artificial lighting (if any) should account for variable light requirements during the course of a day.

9. The other important intervention is PPE (personal protective equipment) or clothing levels. These have to be kept at a bare minimum to ensure that energy requirements for conditioning of air are minimized.

10. The roof of the building also plays a pivotal role. The following interventions are necessary on the roof.

a. The exposed surface area of the roof to be minimum.
b. It should be a green roof.
c. There should be no loading on the roof i.e. water tanks, chiller towers etc.
d. Solar concentrators, solar flat plate collectors and /or devices to be installed for harnessing and harvesting renewable energy.

11. Landscaping should play a very integral role in the overall design and following interventions are mandatory.

a. Regenerative landscaping, permaculture and xeriscaping should be the leitmotif of the landscape design.
b. The site chosen for the building should preferably be a disturbed landscape.
c. Only organic fertilizers to be used.
d. Pest control to be done by IPM (Integrated Pest management).
e. All organic waste to be used for mulching.
f. Hydroponics, drip irrigation, vermiculture and other allied techniques to be used.

12. Buildings are the biggest consumer of all types of resources. The choice of building materials becomes critical.

a. Existing material including waste material to be recycled and reused.
b. New/Fresh material used should be a bare minimum.
c. Building components to be grown using bio-technology.

13. Human waste should be segregated at source – feces and urine. Urine diverter water closets to be used. Urine can be directly used for landscaping as its main constituents are- 95%water and balance 5% is predominantly urea which is a good fertilizer. Urine is also a good natural pesticide. The main constituents of human feces are -75% water and the balance 25% is predominantly NPK (Nitrogen, Phosphorous and Potassium) which are vital for plant growth. Feces along with other biodegradable waste can be used to generate biogas.

Conclusion.

These measures are the very basic considerations in an architectural expression. How best to create or use cutting edge research and technology to achieve these goals is the true test of the talent, skill and enterprise of an architect. If architects fail to perform their duty the sixth extinction is imminent.

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