

Architecture - Where Innovation and Technology go Hand in Hand

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Abstract

This paper aims at highlighting the importance of innovation and technology in architecture. It also introduces the different software's available for architects so that they may be able to design their models more efficiently. This paper also provides an insight to the impact of the business environment of a firm on its innovation.

Keywords: - Architecture, Innovation, technology, open innovation, 3-D modelling.

INTRODUCTION

Being an architect calls for creating structures not just for people to live in but also for them to work, learn or spend some time in. There are many architects, but what makes a few stand out? Well, its innovation. Turning four walls into a work of art is called innovation. Innovation is always welcome in any field but for an architect, the more innovative you are, the better. Innovation in the field of architecture is the art of using the right design, the right resources and the right technology to suit and satisfy the needs of the client in the most cost effective manner. For an architect to gain popularity, he must be able to create designs that are unique, appealing and relevant. Coming up with such ideas for the design is the skill of the architect but being able to convince his client depends on how the architect presents his design. In order to educate a layman about his ideas, he must be able to present his designs in an appealing yet relatable manner. This is very often achieved with the help of technology. Technology plays a very integral part in the everyday life of an architect. With the help of software, architects are now able to recreate designs exactly as they picture it in their mind. Some virtual tools essential for an architect are: Sketchup, it is a software which enables easy 3D designing. Revit is software which helps in making models, rendering and 2D constructions. 3D studio Max is useful for modelling and plugin architecture. Rhino3D is the world's most multifaceted 3D modeller as it can illustrate any geometric or organic form. Maya is an academy award winning software used for animation and

hence is perfect for architectural rendering and 3D modelling. AutoCAD Architecture is yet another software that helps in producing representational drawings. This software mainly deals with drafting and stream lined architectural designing. Vector works Architect enables us to do just about anything with our 3D model, be it bending, pulling or even viewing the model from different angles just by moving the cursor. For realistic visualization and accurate representation of real-world surroundings, V-Ray is highly recommended. In order to finalize the design by adding final touch-ups, rendering, textures, landscape and even editing, Photoshop is an essential tool. In order to compile the completed designs to make a resume or a portfolio, In Design is a very useful layout programme.

LITERARY SURVEY

[1] There are many architectural firms in this world. But for a single firm to rise above all the other, they must be different from the rest. This difference can be brought in terms of technology. Technical advancement in firms happen very often as all firms try to beat the other firms in their technical rivalry. In this rivalry, technological innovation plays a very important role, as they assist in the architectural innovation. Architectural innovations are of two types-radical and incremental. Radical innovations employ a new approach and methodology to a problem while Incremental innovations reinforces the capabilities of established organisations. These minor innovations are often those that bring about greater competitive consequences. [2] In the

present times, the architecture and construction industry are experiencing a lot of technological institutional transformations. These transformations not only benefit the industry but also bring along difficulties and challenges. The industry is accepting new modes of information sharing and popular innovations such as building information modelling (BIM), sustainability, collaboration and many more. The main reasons for these transformations are the needs of the architects of the 21st century, to adapt to the fast growing dependence of the designing industry on technology and the need for finding multidisciplinary solutions to complex problems. Hence to equip the emerging architects with tools to survive in this fast paced world, the knowledge of BIM and sustainability need to be adopted into a highly constrained curricula. [3]Over the years, firms and companies in the structural industry are constantly improving their design innovation process in order to catch up with the pace at which the world is going. Change at such radical levels require powerful new tools that will facilitate the fundamental redesign of work. The approach that is called for is called process innovation, which combines process view of business with the application of innovative technology to key process. [4]The benefits of 3-D modelling in design and construction can be seen through the example of architect, Frank.O.Gehry. He has received many prestigious awards including the Pritzker prize. However, his ability to use technology and innovations in the tradition-bound architecture is the reason for his success and his legacy is a great example of the fact that innovation and technology go hand in hand in architecture.3-D digital representation has changed the way architectural designs, drawings and models are represented, communicated and viewed. This form of representation is more interactive than the 2-D form of representation. 3-D representation also helps the designer to view his model from multiple aspects through a single representation. Thus when innovation and technology meet, new heights are reached in the field of architecture. [5]The future of architecture is leading to open innovation. Open innovation, in short is 'the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation' (Chesbrough 2006, 1). Open innovation

encourages firms to use both external and internal ideas together in architecture. The external ideas very often include technological innovations. This kind of innovation also treats failures as an outcome of the company's business model and sees them not as a loss but as an opportunity to take the company's economy to a whole new level. [6]Open innovation, the future of architectural firms is an approach that combines interdependent theories and the creative use of fundamental knowledge. This kind of innovation increases the extent of business and technological interdependencies between firms. This adds to the complexity of the innovation process. [7]Scholars on innovation and technology have always argued that innovation must not have a policy based approach but a system based approach will be a more appropriate alternative. Yet the innovation system that needs to be followed is not perfect. Only through systematic learning process can we improve and overcome the limitations of the innovation system analysis and policy making. [8]Architecture is a field wherein unintentionally, a lot of harm is brought to the environment. But when the construction is done in a manner in which the environment is taken into account, it is called sustainable architecture. The idea of employing the concept of 'green design' in today's architecture shows the changing attitude of people and the involvement of environmental innovation. In order to achieve the goal of 'green architecture', very often the search is for the right technological pathway but instead we must take into account multiple factors and combine innovative design and technology to achieve our goal. [9]A firm that pursues a strategy of unrelated diversification but ensures that technologies have combinatory potential over divisions could enhance its financial synergy in designing. Linking knowledge to the financial performance of the firm can help estimate the benefits of such a hybrid diversification strategy. [10]Managers of architectural firms accept innovative ideas with a hope for profit for their firm. But very often there is no guarantees that innovators will be rewarded for their effort, hence restricting the firm to follow the books and not think out of the box. This is very often the reason for the success of small start-up firms with the willingness to take risks and be innovative. Hence it is important that the business environment of a firm be managed such

that they be aware of the advantage of technology in the works of the innovators. Investing in technological innovations increases the success of the architectural innovations, giving a boost to the economy of the firm.

FINDINGS

The survey revealed that architecture is a field wherein innovation in terms of design and technology are closely integrated. It proves the fact that the 'more innovative' the architect/firm is, the better the chances of their success. But this survey also brings to light the fact that these architectural innovations need to be backed up with technology for the most optimum outcome and for this, the emerging architects must be taught this in their curriculum as well as accept the idea of open innovation system. This survey also shows the need for firms to embrace innovation in order to make profit, gain fame as well as benefit mankind and the environment.

RECOMMENDATIONS AND CONCLUSION

Firms need a proper business environment in order back innovations with technology and hence must know how to manage and provide innovators with the required resources. All in all it is an underlying fact that whether a freelancer or an architectural firm, innovation is a keystone in the success of an architect and this is not possible without the right technology. Hence all must embrace thinking out of the box.

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