

Construction Techniques and Technologies

It is essential to point out that the development of a homebuilding stratagem by the Habitat for Humanity is coherent with the institution's strategic plan and involves the integration of project management stratagems that enhances the use of construction techniques. As such, the research regarding utilizing construction techniques and technologies to support a homebuilding strategy is both, positive and complex. As identified in the project management methodology section, the identification, evaluation, and implementation of construction techniques and technologies ties directly into the project feasibility, and the planning and design phases (Allen and Iano, 2011). The research regarding the construction industry as a whole revealed a lack of progression concerning production efficiencies created by innovative techniques or technologies in comparison to other sectors over the past x amount of years (Barbosa et al. 2017). Further, the research regarding various construction techniques and technologies was sophisticated and, at times conflicting due to the tremendous variety of methods or technologies available on the market (Sriram, Mohammad, and Nieuwland, 2015).

The lack of progress concerning production efficiencies caused by increased innovation techniques over the past x number of years is attributed to various reasons. According to Sriram, Mohammad, and Nieuwland (2015), the lack of productivity, particularly in construction, is the chief cause of inefficiency. The other reasons that prove the relevance of production inefficiency stem from the poor organization by the management as far making concrete decisions are concerned particularly in the procurement phase. Next is the inconsistency in communication due to poorly crafted communication channels between the contractors and the owners. Also, the lack of accountability propagates poor productivity. Lack of planning especially for immediate, medium, and long-term objectives of completion of distinct tasks and notifying all relevant personnel such as the suppliers also leads to production inefficiency. Barbosa et al. (2017) add that the fragmentation of construction without giving attention to risk assessment also results in inefficiency.

The availability of numerous technologies made the research not only to be conflicting but also to be complicated. According to Spak et al. (2016), companies in the contemporary society are now combining various emergent technologies in the collection of information and simplifying the construction process through innovation. Wallbaum et al. (2012) posit that examples of such technologies are the use of drones than human beings to carry out inspections, the utilization of wearable technology, and the investment in the use of modular homes. Razak et al. (2010) argue that such technological platforms that are barely a decade old are being maximized to facilitate ease of construction. New construction technologies, materials, design approaches, and advances in big data and digital technology have resulted in the creation of a new wave of innovative construction techniques (Attmann, 2010). Further, unique, and emerging construction

techniques and methods are providing cheaper and more efficient opportunities for the construction industry (Lee & Canadian Centre for Policy Alternatives, 2016).

Therefore, these technologies subject to be discussed below facilitate the effectiveness of the industry. For instance, Quale et al. (2012) implore that one of the techniques involves the use of modular homes. The modular houses are built indoors in a warehouse that is not subjected to the vagaries of weather and climate, later on, transported to the new site, and assembled. The other technology involves the use of prefabricated construction (Blismas, Wakefield, and Hauser, 2010). The incorporation of prefabs is also similar to that of the modular homes, in that construction of the housing units is done at an off-site location from the original house and later transported and integrated into the main house. Similarly, Allen and Iano (2011) implore that the use of computer-aided design is also reflected in most of the constructions in the 21st century. The technology facilitates high accuracy of housing models, by providing both two -dimension and three-dimension images. Also, the setting up of secure foundations is also influenced by technology. For example, Allen and Iano (2011) say that some foundation designs may include the use of typical footing, putting of slabs for areas with average levels of frost line and in some cases using permanent wood as the primary base of a building. Besides, Klein (2012) adds that the walls systems must reflect the needs of the owner. As such, the construction of the load-bearing wall may be in the form of precast concrete, stone, metal studs, and reinforced concrete. Finally, the roofing designs also reflect customer needs while depending on technology. For instance, Griffin et al. (2010) posit that for the maintenance of longevity, the use standing seam metal, and tiles that are made of clay will ensure that the roof has a lifespan of more than fifty years.

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