The Benefits and Challenges of Automation in Modular Construction

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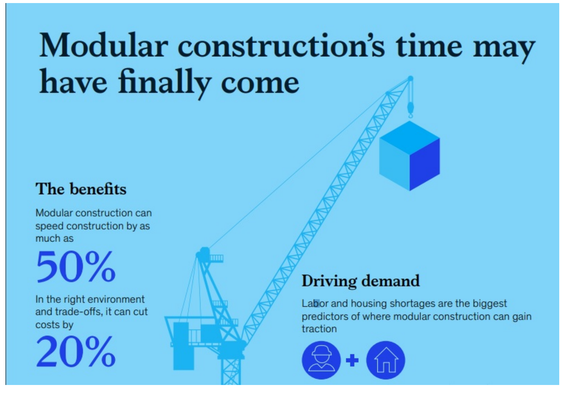
Methodology

For this research paper, a mixed research method was used that combines a literature review and a qualitative method to gather data. These research methods have been proven to be powerful tools to investigate the process and function of automation. To gain more insight on the benefits and challenge of automation in modular construction, a list of predetermined questions was developed to focus on the benefits and challenges of automation and modular construction.



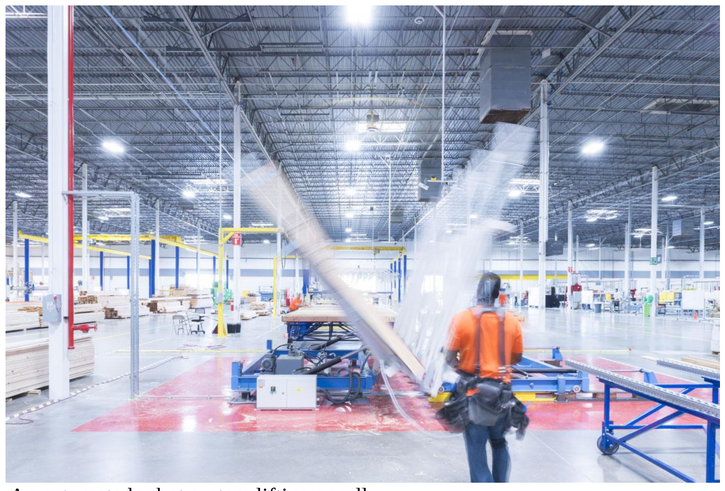
Abstract

Modular construction combined with automation technology such as robotics presents benefits and challenges associated with it. Modular construction takes on the traditional building methods and has streamlined the production of modules making it safer, efficient, and productive. Along with innovation and cutting-edge technology such as automation, it offers an alternative building method to the modular construction industry that enhances productivity, worker safety, and efficiency. This research presents an investigation on factors that may be benefited by the adoption of automation but also address the challenges of it in modular construction. Qualitative interviews with designers and consultants in the modular industry were conducted to gain an understanding on how they are utilizing the technology of robotics and automation to combat the construction industries shortcomings. The main benefits and challenges are grouped and ranked in order of importance: Capital-Investment and maturity, Operational and Work-Culture Requirements, Labor shortage, Safety and Productivity, and Affordable housing. This study will help industry leaders and stakeholders arrive at a general sense of the essence of automation and modular construction, while the research community will get a grasp of the embracement for automation.

Key Words: Automation, Modular, Safety, Productivity, Construction

Conclusion

After conducting extensive interviews and researching the benefits and challenges associated with automation in modular construction, this research has revealed that its implementation is feasible. The automation of building tasks can enable the modular industry to improve performance by reducing errors, improving quality and speed, and going beyond human capabilities. It is the technological, economical, and social factors that will play a big role in determining the pace of adoption in the modular industry. Although construction automation is still in development, it can be expected that with continued effort in research and development, the integration of automation may soon see a phase of growth and adoption on a substantial scale. In order for builders and developers to obtain performance benefits of automation, they must embrace the opportunities of productivity growth potential and advocate for innovative polices that help workers and institutions adapt to the change of work environment. Rethinking education and training programs will be crucial in the adoption of automation due to the new demand of engaging comprehensively with automated systems. Furthermore, to achieve a positive outcome, policymakers and business developers need to embrace the benefits of automation, and at the same time address the technological transition to the workforce.



An automated robot system lifting a wall panel at the AUTOVOL factory

Overview of the the AUTOVOL factory

AUTOVOL- A first of its kind automated volumetric modular construction firm located in Boise, Idaho

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