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Continuous Technological Improvement Using Systems Engineering Principles to Achieve Sustainability:
An Investigation Into Related Literature

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ABSTRACT

The design of a continuous plan would benefit society, as seen in systems engineering. To understand complex systems and to uphold the principles of stability, systems engineering has shown that it is a discipline of great importance. The principle of continuous technological improvement has augmented this idea, as the quality improvement of the design to meet inherent objectives would be the focus. This study aims to present the necessity of continuous technological improvement through systems engineering principles for socioeconomic and community-oriented growth. Thus, the context that would tackle global concerns and facilitate humanity's growth toward knowledge would be the application of technology. The context at hand, the design of systems thinking, and the overall approach taken to promote deeper perspectives has been illustrated in various literature. Healthcare, chemical production and organizational development are various fields of distinction that have shown evidence from the investigation into related literature. To streamline quality, as well as to maintain high quantities of production, all employed systems engineering have focused on technological improvements. In the field of industrial engineering, for a stable industry in which the system operates, this line of thinking is crucial.

KEYWORDS

Continuous Improvement, Systems Engineering, Technology

INTRODUCTION

The delivery of theory to applications has been the focus of the field of systems engineering. In the course of understanding how applications can be utilized on a mass-scale, it is of great importance to the field of technological improvement to use design initiatives. According to Hitomi (2017) and Todorović et al. (2015), manufacturing systems "not only play a role inside each firm but are a part of the socially spatial interaction structure, settlement systems, and world systems as a whole" (p. 26). Hence, how systems engineering principles work as a whole and how they can inherently influence the outcome of the design is important to understand. Also, a feat that is desired by many is technological improvement. According to Langford (2016); Shenhar and Levy (2007); and Parast (2011), the integration of theory with the right application to solve a social problem (i.e., healthcare or construction) is the goal of systems engineering. This integration can yield endless possibilities to further delineate the nature of systems engineering as not only an emerging field of importance, but also

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as a stable field for the continuity of society itself. With these principles at hand, this study will look into the impact of systems engineering on the future of technology and its continuous development.

The goal of many engineers in the field of manufacturing, production, and process has always been continuous technological improvement. With this in mind, in the goal of streamlining the process and ensuring that quality and quantity goals be maintained without any compromise, the role of technology has taken the frontline. With the design element to be considered, the focus of system engineering can expand beyond theory to actual application. As noted in Suthersan et al. (2016); Nagel (2015); Zwikael & Smyrk (2012), the benefits of systems engineering were noted through remediation engineering: the utilization of knowledge to provide solutions of otherwise non-functional situations. Hence, to optimize what needs to be done and to ensure the recovery of actions that requires remediation (i.e., lost fuel, waste products, and other system concerns) is the goal of technology. Furthermore, as stated by Wasson (2015); Sutherland (2004); Gafi and Javadian (2018), the dynamics involved in systems engineering were an involved process; various elements of the process must be considered to enable a clear-cut solution while improving the overall development of a given system. Thus, the translation of the system into actual practice, which is enhanced through technological improvement, would yield success.

Integrating systems engineering principles into continuous technological improvement is a necessary action because of the expansive learning process involved. One example is noted in Benson and Magee (2014); Marcelino-Sádaba et al. (2014), in which they examine renewable energy technologies and the improvement of the integration process. Furthermore, the innovative approaches toward the management of energy have evolved, and the impact of these actions was noted through improved application and lowered losses. Furthermore, as presented by Acemoglu (2015) and Lee et al. (2013), technological improvement had diverse impacts. While technological change can radically impact socioeconomic landscapes, what people do with the technology is more important. Managing technology to maximize potential involvement and knowing the inherent influences that technology would have should be learned.

With technology and systems engineering, much can be learned in today's society. As emphasized in Penzenstadler et al. (2014); and Hoon, Kwak, and Dixon (2008), technology was involved in the sustainability of a system, its implementation of safety, and the upholding of security. These principles were critical for laying down the inherent requirements of improvement that were in demand at the time. With these considerations, engineering is a dynamic and adaptable field. So, inspecting the extent of the influence of technology and its role in applying the systems engineering principles to enhance overall development is critical. Afterwards, minimal impediments and other barriers to success can be facilitated through continuous technological improvement.

A feat that must be explored is the idea of integrating principles toward application, as understanding this discipline is filled with various principles that are relevant to today's society. However, the extent of knowledge applied is not the question, but rather how relevant it is in today's context. Since it is integrated in the field of expanding knowledge, systems engineering is very critical. Furthermore, to integrate the principles of engineering in a manner that would promote procedural improvement over time is the aim of systems engineering. In this respect, the growth of technology can be influenced by the discipline. As a result, understanding continuous technological improvement through systems engineering principles in the perspective that includes enhanced educational perspectives and community-oriented actions is the focus of this research.

More specifically, promoting deeper socioeconomic and community-oriented actions that would apply systems engineering in a holistic concept is the aim of continuous technological improvement. By understanding the role of technology in continuous improvement, society itself should never be isolated. While the principles are integral in promoting continuous improvement, they can only serve their purpose if they are put into actual practice. The idea behind understanding this initiative can effectively foster a deeper understanding of technology's important role; to successfully integrate the idea and the execution of the system at hand, it presents due evidence. Thus, a critical point of