CRITICAL ANALYSIS ON SUCCESS FACTOR FOR AGILE MANUFACTURING INDUSTRY

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Abstract: The research paper aims to study the Systematic Literature Review (SLR) on how lean systems implemented in service industries and extended to the sustainability model. This study explores SLR considering 137 papers published from 2002 to 2019 into account and focusing on the significance of sustainable development of a conceptual model to explore the research further. This literature review triggered the sustainability development in service sectors such as healthcare, education, public sector, banking, and financial services, IT/ITES, telecom services, hotel, and product services. The limitation of this work excluded lean related studies applied in manufacturing sectors and books during the period of study. Specific features discussed on implications of lean applied in service industries and its importance of sustainability, which is scant in the literature. Hence, both academicians and practitioners can be beneficiary from the SLR point of view.

Keywords: Lean service, Service industries, Sustainable growth.

1. Introduction

Today across the globe, all the organizations facing the intricate problems of environmental and social sustainability . Service operations are often well known around the globe. Suppliers, service organizations, and customers link it through service, information sometimes capital flows. Companies all over the world are trying to figure out how to manage their environmental and social performance better. Hence, enhancing sustainability performance and decreasing environmental problems will ensure business in an imperative form. Service organizations responsible for the environmental and sustainability of their customers. For instance, hospitals generate a lot of healthcare waste, and there are issues with storage, transportation, and disposal of that waste. implemented lean in the healthcare sector. The results showed that staff empowerment and continuous improvement in operations prominent to sustainable outcomes. Hence, lean is sustainable in the long term, which is more effective than other approaches in the healthcare department.

In India, the postal department utilizes abundant labour availability for their postal services. Postal service industries make environmental pollution by emitting gas through their vehicle transportation. In the sealing section, employees knowingly or unknowingly inhale the smoke during the dispatched delivery article sealing bags. It is a hazard that can cause cancer after a particular period. The postal department has to give prime importance to address this problem and improve the social protection of human well-being through their sustainability. By observing lean performers, discovered correlations between lean and socio-technical architecture. investigated the lean supply chains using CO2 gas emissions as a key performance indicator to measure environmental performance. suggested that when a lean system implemented correctly in service industries, a lot of benefits can get it from the organization in terms of operational and financial performance. The word "sustainable development" has attained significant importance in current periods, which will impact our life and society. Hence, organizations have recognized sustainability as a competitive advantage.

Higher education institutes can improve sustainability and reduce environmental problems through assignment submission and academic files, and it must be in digital form. The motto of the education institutes goes by "save the environment; save trees" concepts. criticized that there is no school has awarded as a sustainable practice. Hence the articles, as mentioned earlier, were explained lean

applied in service industries and the importance of sustainability issues. Research Questions (RQs) formulated to address these issues,

2. Literature Review

Dive et al. (2017) Experimental Modal Analysis (EMA) is a method to predict the behavior of a system by effectively using the modal or vibration data. It helps in understanding and evaluating the dynamic behavior of a system in actual scenario. In this paper, an attempt is made to study the free vibration analysis of the cantilevered beams of different materials and lengths. The results obtained theoretically are cross checked using the ANSYS simulation package.

Vishwarkarma and Bhaskar (2017) In the present research work, analysis of failure of different beam-column joints is made under different earthquake shaking conditions for strength and stability.

Mekalke and Sutar (2016) In the present research work, modal analysis of different cantilever beams of different materials and geometries is carried out using both analytical and simulation approaches, by introducing a spring mass system.

Lee et al. (2003) Most of the building structures consist of structural elements such as beams, columns, braces, shear walls, foundations, and floor slabs. In general, the models used for the analysis of building structures are prepared without the floor slabs assuming that they would have negligible effects on the response of a structure. Therefore, the floor slabs are simply replaced by rigid floor diaphragms for the efficiency in the analysis. Several researchers attempted to study the effects of floor slabs using finite element models with refined plate element meshes to account for the flexural stiffness of floor slabs. Since beams and floor slabs are not located in a common plane, in general, rigid bodies shall be introduced to represent the T-beam effects. Therefore, the model used in the analysis of building structures with floor slabs would have refined finite element meshes with too many degrees of freedom to be used for the practical engineering purpose. The analytical model was proposed in this study for the efficient seismic analysis of building structures considering the flexural stiffness of the floor slabs. The proposed model employs super elements, rigid diaphragms, and the sub structuring technique to minimize the number of degrees of freedom to be used in the analysis. Analyses of example structures were performed to verify the efficiency and the accuracy of the proposed model in the seismic analysis of multistory building structures. The proposed model could

provide seismic response of the example structures in significantly reduced computational times while the accuracy in the analysis results such as vibration periods and response time histories were very close to those obtained from the refined model.

Sharma et al. (2011) Seismic performance of reinforced concrete (RC) framed structure can be assessed with various analytical tools that may broadly be classified as linear elastic procedures and non-linear or inelastic analysis procedures. Since the reinforced concrete structures generally go in the inelastic range due to seismic loading, inelastic procedures predict the performance of the structures in a much better and realistic way than the linear elastic procedures. However, at the same time, the inelastic procedures are computationally much more demanding. Thus, a good balance between accuracy and computational effort is often sought for. Often, important structures are analyzed using inelastic procedures so that the actual performance of the same can be assessed under earthquakes, whereas less important structures are analyzed using linear procedures. To assess the seismic behavior of RC framed structures, various experimental procedures are used. Monotonic pushover tests give information about the load carrying and deformational capacity of the structure along with sequence of failure modes but only in one direction. Static cyclic tests, where inertia effects are not included give the above mentioned information for to and fro loading direction along with the information on energy consumption. Shake table tests, which are closest to the real life earthquake tests provide almost all the information required to understand the seismic behavior but the scale of such tests are usually limited by the capacity of the shaking table facility.

Biondini (2022) The paper presents a three-dimensional finite beam element for damage evaluation and seismic analysis of concrete structures. The proposed formulation takes both mechanical and geometrical non-linearity into account. The measure of the seismic structural performance is based on a set of damage indices defined at different scales. The accuracy of the finite beam element is proven with reference to the results of experimental tests on reinforced concrete columns under complex loading histories. An application to the seismic analysis and evaluation of the structural performance of a concrete bridge is finally presented.

Heydari et al. (2021) Present research tells about the flexural vibration analysis of a cracked with the help of a continuous bilinear modeling approach for the displacement field, considering the effects of shear deformation and inertia of rotation.

Shahnewaz et al. (2021) A predominant failure mode in deep beams is shear failure which is a brittle and sudden and can lead to catastrophic consequences. Therefore, it is necessary to investigate the shear deficiency of deep beams under seismic loads. This paper aims to investigate the seismic performance of reinforced concrete deep beams structure. A reinforced concrete structure with a deep beam in the first storey was selected from the literature and was analyzed. The capacity of the structure was calculated using non-linear displacement based Pushover Analysis (POA) and the seismic demand was calculated for ten different earthquake records using non-linear Time History Analysis. The study showed a significant strength deficit in the deep beam at the first storey level under different earthquake records. While the drift of the structure and the inter-storey drift ratio were found in the tolerable limits the base shear capacity of the structure was found insufficient.

Salawu (1997) of natural frequency as a diagnostic parameter in structural The research paper assumes that natural frequencies are the most sensitive indicators of any structural integrity. Considering the assumption assessment of structural conditions of systems is made.

Ghodge et al. (2018) in the present research work, modal analysis of a cantilever beam and a simply supported beam is performed using different materials on ANSYS. The results show that for the cases material, structrual steel gives higher values of natural frequencies.

3. Method

The research aims to analyse the suitable articles for the scope of sustainable development in service industries, which is scant in literature. A literature review is a logical method to formulate model in any developing field (Easterby-Smith et al., 2002). The top journal articles considered from the period of 2002 to 2019. The reason for selecting 2002 is lean manufacturing concepts widely adopted in service industries, and the argument started on sustainability during this period. We have used keywords such as lean service, lean applied in service industries, lean implemented in service, sustainability, sustainable service, lean sustainable service.

4. Conclusion

This paper highlights the SLR of lean applied in different service industries starting from January 2002 and ending to April 2019 in 137 top academic journals. First, this research provides recent patterns in LS literature - classifying research context, country wise. Second, we included conceptual, case study, theory, review, survey articles, to analyse different features and activities in lean service field. Third, we have depicted a clear and rigors lean sustainability model for service industries. Fourth, we have shown the importance of lean sustainability barriers and critical success factors while implementing in service industries. The limitation of this work we have excluded lean related studies and books and consideration of period study. The implication of this paper has a complete alignment with the triple bottom line framework of sustainability principles. In future scope, academicians and practitioners may apply this model to test empirically to check robustness & sustainability in different service industries.

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