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A review on system integration of industrial 4.0

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ABSTRACT – Nowadays, manufactures are encouraged to embrace the industry 4.0 in an effort to transform manufacturing landscape by eliminating isolation system and optimizing staffing for key personnel. The aim of this work is to identify current and previous publish journal which is 5 years back that contribute in industry 4.0.This work focused on system integration that generated unused capacity using Time-Driven Activity Based Costing (TDABC), and optimizing staffing system using Mahalanobis- Taguchi System (MTS). Therefore, integration of abnormal diagnostics through MTS and costing sustainment through TDABC is the biggest opportunity to eliminate unnecessary complexity in production environment.

1. INTRODUCTION

Industry 4.0 is the current trend in manufacturing technologies that gives the smart vibe of factory system and gives the automations area in manufacturing new high-tech strategy. "Smart factory" also is the another name of Industry 4.0 that includes varieties of smart system that can gives change of the technological economic and social system in industry. This paper intends to identify the previous and current research that needs to integrate multi-systems which contributes to industry 4.0. To produce the concept of smart factory mostly focuses on to eliminate any unnecessary complexity throughout the manufacturing industry. Therefore, this work is investigated the greatness of MTS and TDABC which contributed to the costing sustainment.

2. METHODOLOGY

System integration in this project has been considering many researches from previous work within 5 years back. The research process also being detail in various areas to identify which aspect can relate to the objective of the paper which is to identify current research needs by integrating multi-systems which contribute to the revolution 4.0. Then, among the previous journal discovered that MTS focus on any abnormal activities of the items and TDABC for costing sustainment that usually happen especially in engineering.

3. INDUSTRY 4.0

Industry 4.0 is stated to the production or manufacturing industries with digitalization transformation connected to technologies. In previous study [1] claimed that, industry 4.0 important to face challenges in future manufacturing industry.. Then, [2] stated that Industry 4.0 as policy-driven innovation discourse in manufacturing industries that aims to institutionalize innovation systems that encompass business, academia, and politics. In Korea perspective stated that companies should seriously considered industry 4.0 as they develop their future initiatives since traditional manufacturing business models do not fit with industry 4.0 technologies [3]. Worked by [4] agreed that industry 4.0 increased the flexibility in manufacturing with mass customization, better quality and improved productivity. Also [5] agreed that, industry 4.0 developed smart decision through real-time communication then can cooperate with human, machines, sensors, and so forth. Figure shows the application of various areas in industry 4.0.

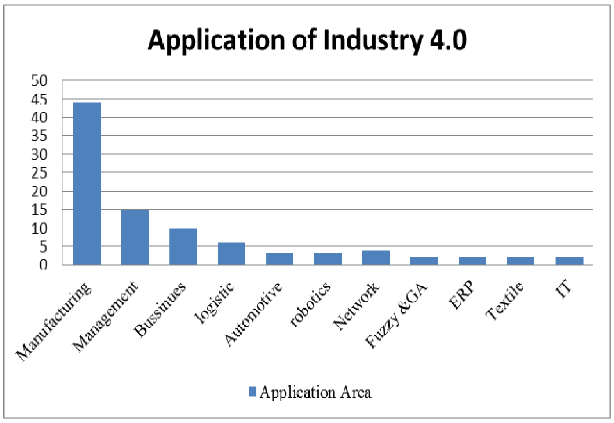

Figure 1 Application of industry 4.0

4. MAHALANOBIS-TAGUCHI SYSTEM

Varieties of application used in previous journal about MTS to prove the abilities of this method to measure the degree of abnormality in the analysis and observations. Then, another stated that, MTS is a data analytic method for the diagnosis with multivariate and it is useful for quantitative decision making together with Mahalanobis distance as a role [6]. Also [7] mentioned that the important and crucial stage in MTS is the selection of variables or the dimensional reduction process in order to access the diagnosis and future prediction efficiently. In this paper [8] said that MTS also can be used to select important factors and has been applied in numerous engineering fields to improve product and quality process. Then, another journal [9] used MTS to narrowing the scope of inspection and improving the detection of efficiency based on ReliefF algorithm to obtain quality characteristic. MTS also used in multiclass problem space [10]. MTS able to extracting information in a multidimensional system and integrating information from different variables into single composite metric and Figure 2 shows the application of various study in MTS.

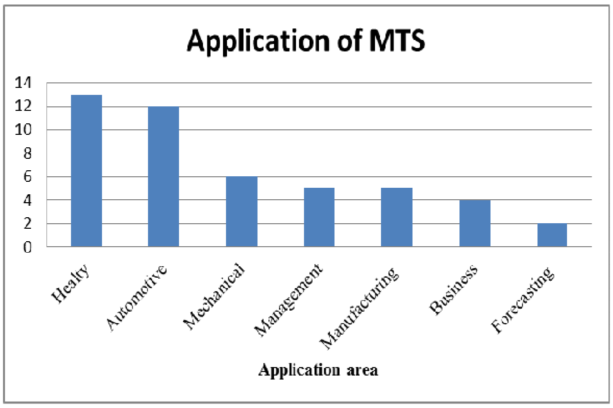

Figure 2 Application of MTS

5. TIME-DRIVEN ACTIVITY BASED COSTING

TDABC is a cost driver that can help in cost processes efficiently. In previous study [11] stated that TDABC applied in health care and can help efficiently in cost processes also can overcome the challenge using current-accounting methods. Then, [12] used the method as opportunity to identify the cost reduction of patient care and found that it is considered as the most sophisticated and precise. Worked by [13] evaluated the degree of integration of costing methods using ABC, TDABC, and Value Stream Costing in lean enterprises. [14] summarized a single-center experience of transitioning from the use of multi-step extracorporeal photopheresis system, by considered through TDABC and [15] evaluated the delivery costs and reimbursement for definitive radiation therapy and advanced for cervical cancer. Figure 3 shows the application of TDABC in various areas.

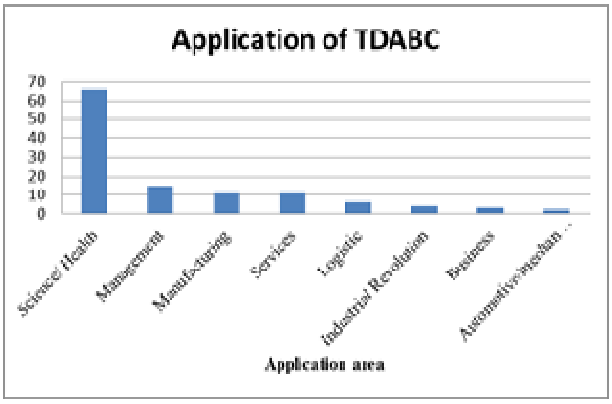

Figure 3 Application of TDABC

6. CONCLUSION

In conclusion, the previous study which are 5 years back papers prove that, there are no works been done which contributes to the development of industry 4.0 through the integration of MTS and TDABC.

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