

MANAGEMENT OF AUTOMATED MANUFACTURING SYSTEM TO ENHANCE MANUFACTURING CAPACITY FOR AUTOMOTIVE PARTS INDUSTRY

Asst. Prof. Dr. Natnicha Hasoontree

Faculty of Humanity and Social Sciences, Suan Sunandha Rajabhat University

Email: natnicha.ha@ssru.ac.th: drnatnicha.ha@gmail.com

ABSTRACT

This research was aimed to study the factors of the automated manufacturing system management, staff readiness, enterprise, government support, readiness of automated system installation and effect on the capacity for automotive parts industry. It was the quantitative and qualitative research methodology by using the questionnaire, in-depth interview and participant observation for gathering data from 400 entrepreneurs. The data analysis by using percentage, mean, standard deviation, multi regression analysis and causal analysis by path analysis. The findings revealed that the entrepreneurs agreed that the automated manufacturing system for the automotive parts industry had the good break-even point due to it increased the product and the manufacturing efficiency included the government support in using the automated manufacturing system to enhance the manufacturing capacity for automotive parts industry which it was in the very high level depended on the automated manufacturing system management, government support, readiness of staff and enterprise consecutively.

Keywords: Automotive Parts Industry, Automated Manufacturing System, Manufacturing Capacity

INTRODUCTION

Thai government announced the model of “Thailand 4.0” in 2016 which emphasized on creating the innovation for Thai economic sustainability, the aim of driving “Thailand 4.0” was to be the “high income economy country” by the innovation of technology – if it could, it would bring the total economy out of the trap of the middle income economy country, decrease the dependence on other countries and the inequality for truly balance of economic and social sustainability. The automotive and parts industry was specified as the strategic industry by the public sector to develop the industry and export of Thailand. The regulation of automotive industry forced to use the local contents in the specified proportion, then it affected to the development of automotive parts industry especially the original equipment manufacturers (OEM) which imported the technology from abroad for the standard of each model as the headquarter specified. Thai small and medium manufacturers had to adjust and improve their manufacturing standard to encounter with the drastic competition from the oversea manufacturers. Nowadays, the automotive manufacturing enterprise specified the high

standard which affected to the development of automotive parts manufacturers to enhance their manufacturing standard and the adjustment of the manufacturing automated system to increase the efficiency and product, decrease its cost and encounter with the labor issue included the unstable economic condition. The adjustment of the manufacturing process in most industry from the basic machine to the automated manufacturing system would be a choice of enhancing the competitive advantage in Thai industry included the training for various labor skills (Matthias, Philip, and Dmitry, 2009) and the using of high technology to encounter with the new manufacturing system and machine as “Thailand 4.0”.

Objective

1. To study the level of variable affecting to enhance the automotive parts industry.
2. To study the causal relation of variable in enhancing the automotive parts industry.

METHODOLOGY

The researcher provided the mixed methods research by the quantitative and qualitative research, the population and sample group were 400 staff of the enterprises in the automotive parts manufacturing association. For the qualitative research, data was gathered by the in-depth interview with 10 staff who relevant to the automated manufacturing system in order to survey the issue and treat of using the automated manufacturing system such as the entrepreneur, staff and government support included suggestion and solution.

CONCLUSION

The findings revealed; 1. Most of the enterprises were located in the central region and Bangkok, consisted of 51 – 100 staff, the registered capital was 1 – 750 million baht as specified with 10 million baht and the stakeholders were Thai people. The entrepreneurs agreed that the installation of automotive parts manufacturing system was worthy due to it enhanced the product and manufacturing efficiency, solved a lack of labor and decreased the logistics cost included the executive’s intention in resource and budget allocation, and the motivation to achieve the enterprise’s goal in the very high level. The risk management of executive was in the excellence level, the government support in using the manufacturing system was in the very high level and the staff readiness in using the automated manufacturing system to enhance the manufacturing capacity of the automated manufacturing system was in the very high level such as an amount decrease of labor, a time decrease of manufacturing, a quality increase of product, a quality control of product, an in-time delivery, a safety of workplace, an accuracy of manufacturing control, and a data management especially the competitive advantage in the global level, 2. The manufacturing capacity of the automated manufacturing system was in the very high level which depended on a readiness of automated system installation, a government support, a readiness of staff and enterprise consecutively, Rapid changes in technological development are forcing business to look continuously for innovative strategies to improve

their competitiveness (Kijpokin, K., 2014) and 3. The readiness of enterprise on using the automated manufacturing system and training the labor skill to encounter with using the automated manufacturing system to increase the amount of automotive parts manufacturing, worthy, and in-time delivery even if it had a high cost. Nevertheless, the labor concerned about lay-off after using the automated manufacturing system, and the government should establish the counselling institute such as organization or university to suggest, train, solve and develop the system included research for creating and publishing the model in order to decrease the cost for the parts manufacturing enterprises with the automated system for being the “Industry 4.0”.

DISCUSSION

The findings could be discussed as follows; 1. The entrepreneurs agreed that the automated system installation of the automotive parts manufacturing would be worthy due to it could increase the product and the manufacturing efficiency, solved a lack of labor and decreased the logistics cost on the principle of systematic management (Otto, J., Henning, S. Niggemann, O., 2014) which was the development of Thai industry for being the “Industry 4.0” with 9 topics: 1) the automated industry robot as the manufacturing assistant, 2) the virtual model, 3) the system integration, 4) the internet linkage for being the intelligent tool, 5) the data security, 6) the data processing and storage through the online system, 7) the product presentation on the 3-dimension printing, 8) the technology for integrating the realistic and virtual object through the 3-dimension tool, and 9) the security of enormous data storage (Michael R., Markus, L., Phillipp, G., Manuela, W., Jan, J. Paseal, E. and Mochael, H., Aprilog, 2015) which revealed that the executive’s intention in resource and budget allocation was in the very high level included the motivation to achieve the enterprise’s goal especially the risk management of executive was in the excellence level, and the government support in using the manufacturing system under the readiness of staff and enterprise, 2. The enhancement of parts manufacturing capacity by the automated system was in the very high level which depended on the readiness of automated system installation, government support, readiness of staff and enterprise consecutively. Nevertheless, the enhancement of parts manufacturing capacity by the automated system would emphasize on the executive’s intention in resource and budget allocation, government support, knowledge and acceptance of staff on the automated system due to these factors would affect to a decrease of labor, a decrease of manufacturing time, an increase of quality, an in-time delivery included a security of the workplace.

Suggestion for this research

1. The government should continue the policy and support the enterprise to apply the automated manufacturing system for the automotive parts manufacturing to be the lead of global automotive industry and no.1 of ASEAN countries.
2. The government should support the small enterprises with the low registered capital to cooperate on the automotive parts manufacturing with the appropriate pattern for their sustainability.

3. The enterprise in the automotive parts manufacturing should emphasize on the enterprise management to ready for the automated system installation, staff readiness for the automated system of the automotive parts manufacturing in case of labor decrease, responsibility adjustment and compensation increase.

Suggestion for future research

1. It should conduct the business research to decrease the break-even point by considering the relevant factors in the automotive parts industry.

2. It should conduct the research to study the relevant factors or variables which affected to the export industry.

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