ANALYSIS OF CONFIRMATIORY FACTORS OF LATENT AND EMPIRICAL VARIABLES THAT AFFECTS THE SUCCESS IN THE BUSINESS OPERATION OF THE AUTO PARTS INDUSTRY.

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ABSTRACT

The purpose of this research was to study the confirmatory factors (Confirmatory Factor Analysis) of latent and empirical variables that affecting business success in the business operation of the auto parts industry with LISREL program to verify the validity and reliability of the empirical variables towards latent variables.

Factor analysis, is conducted to analyze the validity constructed by using confirmed method analysis. (Confirmatory factor analysis) and to validate the consistency between every model factor and the level of leadership variable, planning variable, supporting variable, operation variable, performance evaluation and improvement variable (Improvement) according to theory and empirical data.

The research result found that the lead variable consists of 5 components. The latent variable has a composite reliability (ρ_c) equal to 0.85 with the average variability extracted (Average Variable Extracted, ρ_v) equal to 0.53. The plan variable consists of 4 components with a composite reliability of latent variable ρ_c) equal to .83 with average variability extracted (Average Variable Extracted, ρ_v) equal to 0.56 with supportive latency variables. (supp) consists of 3 components. The latent variable has a composite reliability(ρ_c) equal to 0.86 with averaged variable Extracted (ρ_v) equal to .68. For the operative variable (oper) consists of 5 components. The latent variable has a composite reliability (ρ_c) equal to 0.87 with the average variability extracted (Average Variable Extracted, ρ_v) equal to 0.58. For the performance evaluation variable (peev) consists of 4 components. The latent variable has a composite reliability (ρ_c) equal to 0.89 with the average variability extracted (Average Variable Extracted, ρ_v) equal to 0.68. For the improvement variable (impr) consists of 3 components. The latent variable has a composite reliability (ρ_c) equal to 0.84 with the average variability extracted (Average Variable Extracted, ρ_v) equal to 0.65. For the operational success variable (suss) consists of 4 components. The latent variable has a composite reliability (ρ_c) equal to 0.80 with the average variability extracted (Average Variable Extracted, ρ_v) equal to 0. 50. This can be explained that the variance of all latent variables and each indicator has reliability (Reliability) value at 40 -85 percent with statistical significance at the level of 0.05

Keywords: Factor, Leadership, Planning, Support, Operation, Performance Evaluation, Improvement, Success in the Business Operation.

INTRODUCTION

Currently, competition is very high in business environment, causing manufacturing around the world to improve production efficiency and product or service quality continuously. Organizations are therefore applying various quality management system standards that can build confidence for customers and other interested parties such as ISO 9001:2015, which focus on considering potential risks and set measures to prevent potential problems, including the IATF 16949, which are standards applied in the automotive parts manufacturing industry. Due to an increasing trend of the standard (Standardization) of the automotive parts industry, as well of the road safety standards and environmental standards, therefore the automotive industry and automotive parts industry need to pay more attention to standard and production technology. There is a high possibility to implement more high-technology production machinery to replace labor force accordingly.

In the 12th National Economic and Social Development Plan (2017-2021), to develop industrial in Thailand to be able to move towards a high-income country, it is necessary to determine the target potential industry including determining future industries that can take the opportunity to change to a new context in the world, such as stepping into elderly society, climate change, technological progress, adaptation to the 4.0 industrial age, which driven by intensive digital technology and innovation to upgrade Thailand's economic development. By defining the target industry and development guidelines in the 12th Development Plan, it is considered from two dimensions, which are Thailand's opportunity from changes in various contexts in the world and the real competitiveness of Thailand today. The target industry can be divided into 2 groups which are (1) the industrial group that Thailand currently has a strong foundation to extend to the industry that uses more advanced technology and (2) the future industrial group that takes advantage from new context of the world, in which both groups of industries have different development approaches such as the development of the strength of the industry with current potential to a Leading towards a high-technology industry by developing technological innovation and creativity based on environmentally friendly production with the target industry of automotive and auto parts industry that will develop into future vehicles such as electric vehicles (Office of the National Economic and Social Development Board, 2017)

To survive in the business competition for the auto parts manufacturers and entrepreneurs, there are many factors that that stimulate the organization to be successful in its operations, both internal and external environment, such as international quality management system standards, external environment such as the global economy, government policy, and political stability.

From the reviewing of the literature on the success factors that affect today's business operations, it is found that business executives and leaders are important components that can lead a business to business success. The role of leadership and their commitment in the workplace can also affect the development of the ability of employees towards the successful of the business. (Amer, Hona, 2017) [1]. Quality policy and ability to innovate are part of the capacity of executives and leaders of business to contribute to the effective competitive organization and the ability related to financial resource management which is an important success factor to analyze the industrial operations and entrepreneurial innovation capabilities. Edin Strukan, Milan Nikolic, Senad Sefic, (2017) [2] found that, the entrepreneur's innovation ability that can implement with the rapid environmental changes and the business experience enhancement has a positive and significant effect towards the entrepreneurial innovation ability (Khotchanipa Wanitkittikul et al., 2017) [3].

The important factors for successful system implementation, from the result of the survey which was conducted with the executives of the Indian automotive industry in relation

to the factor analysis system being used to separate important variables based on operational support factors, performance evaluations and improvements. Manisha Seth, Ravi Kiran & D.P.Goyal, 2015) [4]. The literature review of such research and rationale found that the factors affecting the business success of the automotive parts manufacturing industry still lack the factors or variables that affect the business success of the automotive component manufacturing industry. It is necessary for operators or manufacturers to comply with the requirements and application of the quality management system. IATF 16949:2016 (IATF 16949:2016), Quality Management System Requirement and Practice, is accepted as an international standard requirement [5].

In addition, the researcher has studied related research such as Sunee Butdee, Bundit Pungnirund, Nattapong Techarattanased. (2018) [6] studied "Achievement Evaluation Modeling for Non-Food Herbal OTOP Products" The research results were investigated as follows: The key activity and the key partner were highly influent factors for successful performance currently whereas the other influent factors were medium. There were key resources, customer segments, value propositions, customer relationships, revenue streams, key activities, and cost structure. After that, the achievement evaluation modeling for the Non-Food Herbal OTOP products was created by the SEM analysis. The highly influent factors for successful performance were the key activities, key resources and cost structure whereas the other influent factors were medium. There are customer segments, value propositions, customer relationships, revenue streams, distribution channels, and key partners. The research model developed could be used for self-assessment of the Non-Food Herbal OTOP products. They could rapidly improvement, right direction investment and enhance competitiveness. In addition, the research result could be used for policy strategic development in order to promote the Non-Food Herbal OTOP Products.

For this reason, it leads to the test of the auto part industry business success model whether or not, it has any factors or variables that are affecting the business success and in accordance with the criteria and application of the quality management system in order to use the results as a guideline to review the impact on the quality management system and review the compliance with policy requirements and quality objectives. Including the planning, formulating strategies and business plans of each year, and regularly monitoring and controlling risks with a focus on risk management. Especially in critical situations that may occur violently by implementing the risk assessment (Risk Assessment) and set the business's strategy in line with the crisis that may affect the business goals. As the Reasons and challenges mentioned, the researcher is interested to study a model that affects the success in the Business Operation of the Auto Parts Industry Therefore, the research objectives are set as follows

RESEARCH OBJECTIVE

To analyze the confirmatory factors of latent and empirical variables that affects the success in the business operation of the Auto Parts Industry.

RESEARCH METHODOLOGY

This researcher has studied and analyzed the confirmatory factors of latent and empirical variables that affects the success in the business operation of the Auto Parts Industry. By using the confirmatory factor analysis to verify the validity and reliability of each component which is leadership variable, planning variable, supporting variable, operational variable, performance variable and improvement variable according to the theory and empirical data.

The researcher conducted a quality check of the variables studied in the model by checking each latent variable whether it has validity constructed (Construct Validity) or not, with the Confirmatory factor analysis (Confirm Factor Analysis) and whether it has the standard factor loading (Standardize Factor Loading) that is greater than 0.307 or not. If the value is greater than that, it means that, the said empirical variable is a component of good latent variables.

When considering the value of R^2 to check for reliability (Reliability) of the empirical variables studied and check the quality of latent variable by taking the standardized factor load (Standardize Factor Loading) and the variance (θ) of the empirical variable, which is a measure of each latent variable. (Construct Reliability, ρ_c)it should have a value of 0.60 or more and the variance extracted (Average Variable Extracted, ρ_v) should be exceeded. 50.

To verify the validity of the latent variables (Latent Construct Validity) in this research, the researcher used the component model of latent variables studied in the Convergent Model because each confirm factor analysis in the model will cause justification problems (Justification Model) because some measurement models have fewer than 4 indicators, therefore, the researcher decides to use the said technique (Convergent Model).

The sample consisted of 600 factory executives of raw material and parts manufacturers that deliver parts to automobile assembly factories in Thailand, using the 20 times ratio of observed variables. Using a random sampling method and use questionnaires to collect data. The data was analyzed by using structural equations (SEM)

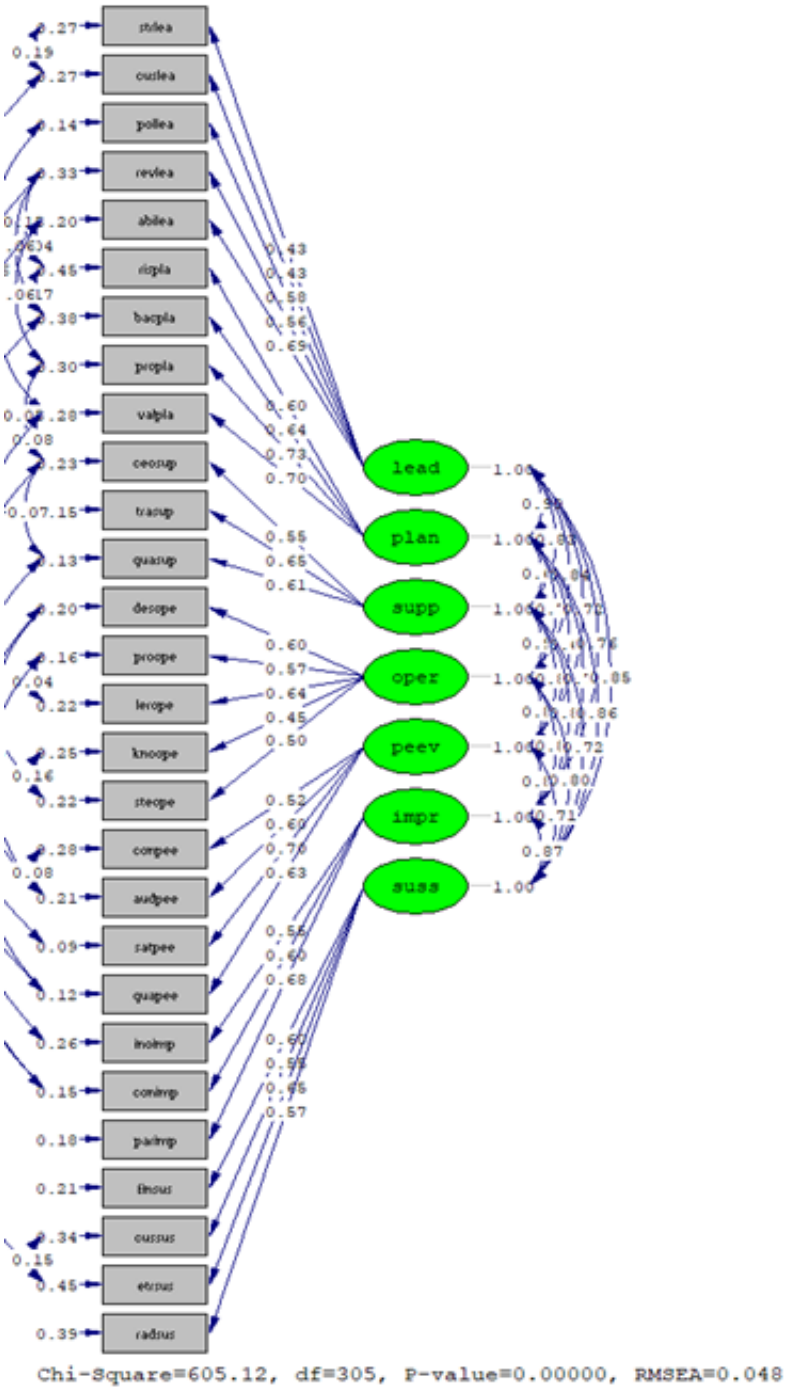
RESEARCH RESULTS

From this verification of the latent construct validity, the researcher chose to use the component model of latent variables studied in the convergent model because each confirmatory factor analysis (Confirm Factor Analysis) in the model will cause a problem of justification in the model (Justification Model) because some measurement models have less than 4 indicators.

Therefore, the researcher decided to use the convergent technique (Convergent Model) in this research.

The results of the confirmatory element analysis of observational variables towards latent variables are shown in Figure 1.

Figure 1
The results of the confirmatory component analysis to verify the structural accuracy model of the latent variables with LISREL program (n = 600)



The results of the confirmatory element analysis of observational variables towards latent variables are shown in Table 1.

Table 1
Factor Loading Score shown as the standardize score of latent variables which studied in the model with the confirmatory element analysis technique (n = 600)

Variables	Factor Loading (λ)	Error (θ)	t	R^2
1. Leadership (lead)				
1.1 Management Determination Leadership (strlea)	.63	.60	16.76	.40
1.2 Customer Focus Leadership (cuslea)	.64	.59	17.00	.41
1.3 Policy leadership (pollea)	.84	.30	24.58	.70
1.4 Management Review Leadership (revlea)	.69	.52	19.01	.48
1.5 Leadership Ability (abilea)	.84	.30	24.80	.70
ρ_c = .85, ρ_v = .53				
2. Planning (plan)				
2.1 Internal and External Risk Assessment Plan (rispla)	.67	.55	17.78	.45
2.2 Back up Plan regarding risk and impact on customers (bacpla)	.72	.48	19.92	.52
2.3 Business Processess Risk Planning (propla)	.80	.36	22.75	.64
2.4 Business value planning (valpla)	.80	.37	22.52	.63
ρ_c = .83, ρ_v = .56				
3. Supportiveness (supp)				
3.1 Support from top management (ceosup)	.75	.43	21.12	.57
3.2 Development and technical training Support (trasup)	.86	.26	25.99	.74
3.3 Supplier Quality Management System Support (quasup)	.86	.25	25.93	.75
ρ_c = .86, ρ_v = .68				
4. Operation (oper)				
4.1 Design and development of products and services (desope)	.80	.36	23.26	.64
4.2 External product procurement and service process control (proope)	.82	.33	23.92	.67
4.3 Organizational Learning Ability (lerope)	.80	.35	23.27	.65
4.4 Knowledge Operational Management (knoope)	.68	.54	18.30	.46
4.5 Stakeholder relations (steope)	.73	.47	20.37	.53
ρ_c = .87, ρ_v = .58				
5. Performance Evaluation (peev)				
5.1 Evaluation of Planning Control Performance Effectiveness (conpee)	.70	.51	19.10	.49
5.2 Defining Internal Auditor Performance Evaluation (audpee)	.79	.37	22.99	.63
5.3 Customer Evaluation Performance (satpee)	.92	.15	29.05	.85
5.4 Review of the organization's quality management (quapee)	.88	.23	26.88	.77
4.5 Stakeholder relations (steope)	.73	.47	20.37	.53
ρ_c = .89, ρ_v = .68				
6. Improvement (impr)				
6.1 Innovation Improvement. (inoimp)	.73	.46	20.41	.54

	6.2 Continuous improvements for quality effective management system. (conimp)	.84	.30	24.96	.70
	6.3 Employee Participation Level (parimp)	.85	.28	25.19	.72
ρ_c = .84, ρ_v = .65					
7. Business Operational Success (suss)					
	7.1 Financial (finsus)	.79	.37	22.21	.63
	7.2 Customer (cussus)	.69	.53	18.28	.47
	7.3 Internal Process (etrsus)	.69	.52	18.77	.48
ρ_c = .80, ρ_v = .50					

From Table 1, the researcher found that the lead variable (lead) consists of 5 components with the standardized solution weight (λ) between .63 - .84 with the standard error (θ) between .30 - .60. The latent variable has a reliability (Composite Reliability) (ρ_c) equal to .85 with averaged variable (Average Variable Extracted, ρ_V) equal to .53. The planning variable (plan) consists of 4 components with the Standard weight (λ) (Standardized Solution) between .67 - .80 and has a standard deviation (θ) between .36 - .55. The latent variables of a composite reliability (Composite Reliability, ρ_c) equal to .83 with the variance (Average Variable Extracted, ρ_v) equals .56. The supportiveness variable (supp) consists of 3 components with the Standard weight (λ) (Standardized Solution) between .75 - .86 with the standard deviation (θ) Between .25 - .43. The latent of reliability variable has a composite reliability (Composite Reliability, ρ_c) equals .86 with Average Variable Extracted (Average Variable Extracted, ρ_v) equal to .68. The operation variable (oper) consists of 5 components with the Standard weight (λ) (Standardized Solution) between .68 - .82 and has a standard deviation (θ) between .33 - .54. The latent variable has a composite reliability (Composite Reliability, ρ_c) equal to .87 with Average Variable Extracted (Average Variable Extracted, ρ_v) equal to .58. The latent variable of performance evaluation (peev) consists of 4 components with the Standard weight (λ) (Standardized Solution) between .70 - .92 and has a standard deviation (θ) between.15 - .51 The latent variable has a composite reliability (Composite Reliability, ρ_c) equal to .89 with Average Variable Extracted (Average Variable Extracted, ρ_v) equal to .68. The latent variable of the performance evaluation (impr) consists of 3 components with the Standard weight (λ) (Standardized Solution) between .73 - .85 and has a standard deviation (θ) between .28 - .46 The latent variable has a composite reliability (Composite Reliability, ρ_c) equal to .84 with Average Variable Extracted (Average Variable Extracted, ρ_v) equal to .65. The latent variable of the performance evaluation (suss) consists of 4 components with the Standard weight (λ) (Standardized Solution) between .67 - .79 and has a standard deviation (θ) between .37 - .55 The latent variable has a composite reliability (Composite Reliability, ρ_c) equal to .80 with Average Variable Extracted (Average Variable Extracted, ρ_v) equal to .50. All the confirmatory component of the latent and empirical variable can be explained that all of the latent variable and each indicator has a composite reliability (Reliability) of 40-85 percent with statistical significance at the level of .05

RESEARCH CONCLUSION AND DISSCUSSION

This research indicates the important factors that affect business success. The confirmatory factor analysis of latent and empirical variables affecting the success in the business operation of the auto parts industry.

The results of the study of the confirmatory factors towards the leadership variables (lead), Planning variable (Plan), Supportiveness variable (supp), Operation variable (oper),

Performance Evaluation variable (peev), Improvement variable (impr), Business Operational Success variable (suss), and towards the success in the business operation of the auto parts industry, the researcher found as following:

The lead variable consists of 5 components with the standardized solution weight (λ) (Standardized Solution) between .63 - .84 with statistical significance at the level of .05 with the standard error (θ) between .30 - .60. This can be indicated that leadership variable (lead) (Each indicator has reliability value considered from R^2 value) resulting between at 40-70 percent. The leadership variable (lead) has a reliability (Composite Reliability.ρ_c) equal to .85 with averaged variable (Average Variable Extracted, ρ_V) equal to .53.

The planning variable (Plan) consists of 4 components with the standardized solution weight (λ) (Standardized Solution) between .67 - .80 with statistical significance at the level of .05 with the standard error (θ) between .36 - .55. This can be indicated that planning variable (Plan) (Each indicator has reliability value considered from R^2 value) resulting between at 45-64 percent. The planning variable (Plan) has a reliability (Composite Reliability.ρ_c) equal to .83 with averaged variable (Average Variable Extracted, ρ_V) equal to .56.

The supportiveness variable (supp) consists of 3 components with the standardized solution weight (λ) (Standardized Solution) between .75 - .86 with statistical significance at the level of .05 with the standard error (θ) between .25 - .43. This can be indicated that supportiveness variable (supp) (Each indicator has reliability value considered from R^2 value) resulting between at 45-64 percent. The supportiveness variable (supp) has a reliability (Composite Reliability.ρ_c) equal to .86 with averaged variable (Average Variable Extracted, ρ_V) equal to .68.

The operational variable (oper) consists of 5 components with the standardized solution weight (λ) (Standardized Solution) between .68 - .82 with statistical significance at the level of .05 with the standard error (θ) between .33 - .54. This can be indicated that the operational variable (oper) (Each indicator has reliability value considered from R^2 value) resulting between at 46-67 percent. The operational variable (supp) has a reliability (Composite Reliability.ρ_c) equal to .87 with averaged variable (Average Variable Extracted, ρ_V) equal to .58.

The performance evaluation variable (peer) consists of 4 components with the standardized solution weight (λ) (Standardized Solution) between .70 - .92 with statistical significance at the level of .05 with the standard error (θ) between .15 - .51. This can be indicated that the Performance Evaluation variable (peer) (Each indicator has reliability value considered from R^2 value) resulting between at 49-85 percent. The Performance Evaluation variable (peer) has a reliability (Composite Reliability.ρ_c) equal to .89 with averaged variable (Average Variable Extracted, ρ_V) equal to .68.

The improvement variable (impr) consists of 3 components with the standardized solution weight (λ) (Standardized Solution) between .73 - .85 with statistical significance at the level of .05 with the standard error (θ) between .28 - .46. This can be indicated that the improvement variable (impr) (Each indicator has reliability value considered from R^2 value) resulting between at 54-72 percent. The improvement variable (impr) has a reliability (Composite Reliability.ρ_c) equal to .84 with averaged variable (Average Variable Extracted, ρ_V) equal to .65.

The business operational success (suss) consists of 4 components with the standardized solution weight (λ) (Standardized Solution) between .67 - .79 with statistical significance at the level of .05 with the standard error (θ) between .37 - .55. This can be indicated that the business operational success (suss) (Each indicator has reliability value considered from R^2 value) resulting between at 45-63 percent. The business operational success (suss) has a reliability (Composite Reliability.ρ_c) equal to .80 with averaged variable (Average Variable Extracted, ρ_V) equal to .50.

RESEARCH SUGGESSTION

1. Suggestions for further research

From the research findings above indicated that this research is consistent with the hypothesis set. However, if the improvement and development are continued, this research it will be an important source of information. Therefore, the researcher has recommendations for the next research as follows:

1.1 Use the research findings and according to all assumptions to develop an assessment model of the successful business operation model of the auto part industry and to verify the confirmation of the research results.

1.2 Should conduct other study on the level of various variables that could affect the success of others business operations.

1.3 should study the influence of various variables that could affect the success of other business operations.

1.4 Should study the development of an assessment model of the other successful business operations.

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