



## An Automotive Part Management Methods of Plant Managers in Managing Thai-Oversea Manufacturing Parts: A Case Study of Effectiveness and Efficiency of Organizational structure Instruction Management.

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### Article info

#### Article history:

Received: 1 October 2019

Revised: 18 November 2019

Accepted: 24 November 2020

#### Keywords:

Organization structure, Automotive part, Manufacturing, Management method, Organizational instruction management

### Abstract

This article presents the study result of organization structure instructs to efficient and effective establish in an Automotive Part Management Method for Plant Manager to manage Thai-Oversea Manufacturing plants. The research methodology using Delphi with Triangulation techniques of 19 Plant managers, and experts confirmed the prototype organization structure. The study objective to find the prototype for efficiency and effectiveness of organization structure instructs and application on two or more automotive parts manufacturer plants in Thai and Oversea. Finding the prototype organization structure in automotive part management plants which are more efficient and effective by a mix of 4 theoretical organization structure forms namely Function organizational structure, Production process organization structure, Matrix organizational structure, and Line & Staff Organization Structure. The suggestions and limitations of the prototype organizational structure are specific for manufacturing plants, starting up manufacturing plant, and the operation tasks also take responsibility from the master plant to control during start-up period.

### Introduction

Kasikorn Research Center (2017) presented a report about the shrinking Thai auto-parts export due to increased foreign investment in the main importing countries like Mexico, Malaysia, Indonesia and South Africa, along with management of supply chain which saw the designing of production base relocation and creation of international business network. Vinodk (2016) found that the current trend of international production networks tended to move their production base as close to the final consumers as possible with focus on

transportation/cost reduction as part of the change in international business strategy. Marcel & Sergej (2016) found that expansion or relocation of production base stems from three reasons: (1) increase and expand the company's opportunity and capability in foreign countries, (2) reduce the original production base due to decreased opportunity and (3) build a new business space for better business activities. The National Institute of Development Administration (2018) found that auto-parts industry is another community continuously expanding its investment abroad. Munkongtum, Piakson, &

Phonvut (2017) found that government support for Thai entrepreneurs capable of investment abroad became an opportunity for Thai entrepreneurs in foreign countries. Reasons above inevitably impacted management of production plants both in Thailand and abroad by Thai managers, and represent new challenges that necessitate searching of new capabilities for successful management of international manufacturing plants and studying on a model for multiple plants management in Thailand and abroad as a guideline for aspirants looking for successful opportunities abroad. In addition, Stephen, DeCenzo, & Coulter (2011) found that the key in organizational management is a good organizational structure that is conducive for effectiveness. Therefore, study on structuring in auto-parts plants with multiple-plant management in both Thailand and abroad is the first priority.

**Objective**

Study effective and efficient organizational structure instruction based on the main study of finding a model for multiple plant management in Thailand and abroad.

**Conceptual framework**

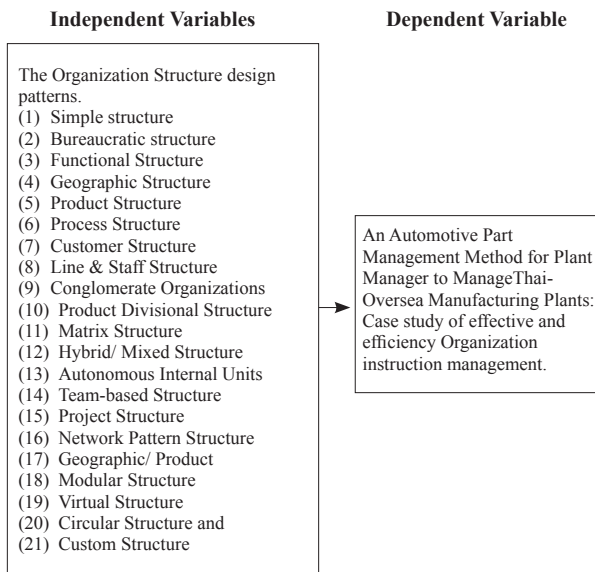


Figure 1 Conceptual framework

**Research scope**

1. This study is part of the research to find a model for multiple plant management in Thailand and abroad as done from March to September 2019.

2. Studied samples were managers of auto-parts or supporting plants in Thailand with at least five years of experience, are in charge of more than two plants in Thailand and abroad, and covering all plant sizes.

**Research methodology**

This study is of hybrid method using Delphi Technique on 19 sampled managers in charge of more than two plants in Thailand and abroad with more than five years of experience in effective and efficient management of plants in Thailand and foreign countries. The study also covers 20 theoretical organization designs, job positions under the managers’ supervision, and causes and guidelines for organization design. The model structure is confirmed and by consensus of seven experts, and its validity and reliability are checked by Delphi process and triangulation.

**Results**

1. Recruitment of managers in charge of more than two plants: because there was no information source explicitly stating expertise and qualifications as managers in charge of over two plants in Thailand and abroad. According to the concept of sample limitations, selection of suitable samples as proposed by Suriyapiwat (2018) was to draw a sample group from experts on LinkedIn as studied by Van Dijck (2016). As a result, sample selection are shown in table 1.

Table 1 Sample information from LinkedIn (accessible at <https://www.linkedin.com>, accessed, 1 March 2019)

Number of automobile managers on LinkedIn	Number (Person)	Percentage
Total	51,186	-
Automobile plant managers	8,765	-
Automobile plant managers based in Thailand	1,598	100
Automobile plant managers who are Thai and eligible for sampling	121	7.57
Experts that stay until the end of Delphi process	19	1.13

According to table 1, the researcher studied each sample group member’s profile by using keywords like “Plant/ Plant General Manager” “Operation/ Manufacturing Manager” and “Director of Operations” for persons based in Thailand along with the word “automotive” on LinkedIn. It could be summarized that 121 managers (7.57%) were eligible for sampling, 19 (1.13%) accepted the invitation and all of them stayed until the end of Delphi process. According to Figure 1 that shows the experts’ classification based on plants they

manage, 11 managers (61.1%) were in Tier I group, five (22.2%) in Tier II, one (5.5%) in Tier III and two (11.1%) in support.

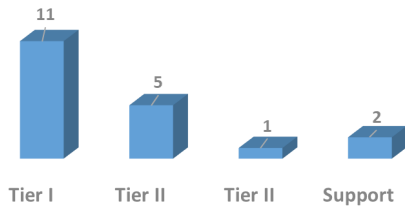


Figure 2 Types of plants the sample group manages.

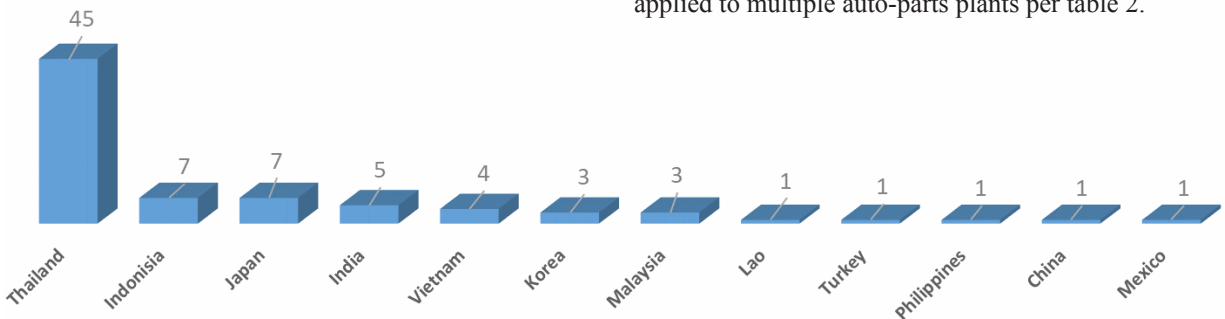


Figure 3 Number of plants in various countries under care of all 19 experts.

According to Figure 3 which shows the number of plants in various countries under care of all 19 experts. In total there are 79 plants in 12 countries. It was found that the highest number of plants directly under a single manager is five and the lowest is two. There are 45 plants in Thailand (59.96%), seven in Indonesia and Japan (8.86%), five in India (6.33%), four in Vietnam (5.06%), three in Malaysia and South Korea (3.8%) and one in Laos, Turkey, China and the Philippines (1.9%), respectively.

2. Effective and efficient design for multiple auto-parts plants.

It is found that 20 different theoretical designs are applied to multiple auto-parts plants per table 2.

Table 2 Auto-parts plant managers' use of theoretical design based on Delphi techniques

Organization type and connection	Application (N = 18)						
	Modeling		Validation		Confirmation		
	Frequency	Percentage	Median	I.R.	Consistency	Percentage	Result
1. Simple	12	66.7	3.00	2.50	High	-	Unconfirmed
2. Bureaucratic	17	94.4	3.00	1.75	High	-	Unconfirmed
3. Functional	18	100.0	5.00	1.00	Highest	100	Confirmed
4. Geographic	14	77.8	2.50	1.75	Highest	-	Unconfirmed
5. Product	15	83.3	2.50	1.00	Highest	-	Unconfirmed
6. Process	13	72.2	4.00	1.50	High	88.9	Confirmed
7. Customer	12	66.7	2.00	2.00	High	-	Unconfirmed
8. Line & Staff	14	77.8	4.00	1.50	High	77.2	Confirmed
9. Product Divisional	11	61.1	3.00	2.00	High	-	Unconfirmed
10. Team-based	14	77.8	3.00	2.50	Highest	-	Unconfirmed
11. Project	8	44.4	2.00	1.00	Highest	-	Unconfirmed
12. Autonomous Internal Units	11	61.1	2.00	1.00	Highest	-	Unconfirmed
13. Line and Advisor	10	55.6	2.00	2.00	High	-	Unconfirmed
14. Conglomerate	11	61.1	3.00	2.00	High	-	Unconfirmed
15. Network Pattern	11	61.1	2.00	2.25	Highest	-	Unconfirmed
16. Matrix	16	88.9	4.00	1.50	Highest	77.8	Confirmed
17. Geographic/ Product	11	61.1	3.00	2.50	High	-	Unconfirmed
18. Modular	6	33.3	2.50	1.75	Highest	-	Unconfirmed
19. Virtual	6	33.3	2.00	1.50	Highest	-	Unconfirmed
20. Circular	10	55.6	2.50	1.75	Highest	-	Unconfirmed
21. Custom	1	5.6	1.00	-	Highest	-	Unconfirmed

Table 2 shows that through study and statistical analysis, four main theoretical organization types were confirmed by the experts as being in use: (1) Functional, (2) Process, (3) Matrix and (4) Line and Staff respectively. There are also single and mixed designs in use.

were managed by the central organization like finance, human resources, sales and marketing.

3. Organization design based on the model of effective multiple plant management in Thailand and abroad. Result from the study to build a suitable

**Table 3** Job positions directly under the plant manager per Delphi study (N = 19)

Managers in charge of multiple plants in Thailand and abroad						Central organization	
Thai		Foreign		Joint		Global report	Percentage of expert
Direct report	Percentage of expert	Direct report	Percentage of expert	In charge of multiple plants and report directly to manager	Percentage of expert		
Production	100	Production	57.9	EHS	21.1	Financial	68.4
M&L, Planner	94.7	Maintenance	57.9	Procurement/ Purchasing	21.1	HR/HRD	63.2
Maintenance	94.7	Engineering (Technical/ Process)	57.9	Quality	15.8	Sales & Marketing	57.9
Quality	89.5	Quality	52.6	M&L, Planner	10.5	Procurement/ Purchasing	21.1
Engineering (Technical/ Process)	89.5	M&L, Planner	52.6	Engineering & Maintenance	10.5	M&L, Planner	21.1
Delivery, Logistics and Warehouse	84.2	Delivery, Logistics and Warehouse	47.4	IT	10.5	Strategy	21.1
Product / R&D Engineer	84.2	Product / R&D Engineer	42.1			EHS	10.5
EHS	73.7	EHS	36.8			Commercial	5.3
Customer Service	42.1	HR/HRD	26.3				
HR/HRD	26.3	Finance and Cost Control	21.1				
Finance and Cost Control	26.3	Customer Service	15.8				
Continuous improvement	26.3	Continuous improvement	10.5				
Sales & Marketing	26.3	Sales & Marketing	10.5				
Laboratory	5.3	IT	5.3				
IT	5.3						

Additional studies on works under the plant manager's responsibility (both Thai and foreign plants) yielded information per table 3. All 19 experts have work departments or positions that report directly to the plant manager in Thailand such as production, M&L/planner, maintenance, quality, engineering, delivery-logistic-warehouse, production/R&D engineer, EHS, and customer service. On foreign plants, positions that report directly to the plant manager are production, engineering & maintenance, M&L/ planner, delivery-logistic-warehouse, product / R&D engineer, and EHS. Departments jointly used by both Thai and foreign plants had no confirmation but there were some processes and departments jointly used between plants like EHS, procurement, quality, M&L/ planner, engineering & maintenance and IT. In addition, some work departments

organization model for the main research question using Delphi technique, triangulation and consensus from the seven experts can be concluded and shown in Figure 4.

3.1 Regarding organization structure instructs characteristics based on the model for management of multiple auto-parts plants in Thailand and abroad, hybridization if four different theoretical structures could be confirmed. The process was done mainly in the first plant and then copied to the other plants.

3.2 The advantage mixed of organizational structure's efficiency and effectiveness of 4 theoretical organization structure forms as Function organizational structure to effectiveness from clearly defined the job responsibility. Production process organization structure with cost and production's availability efficiency and

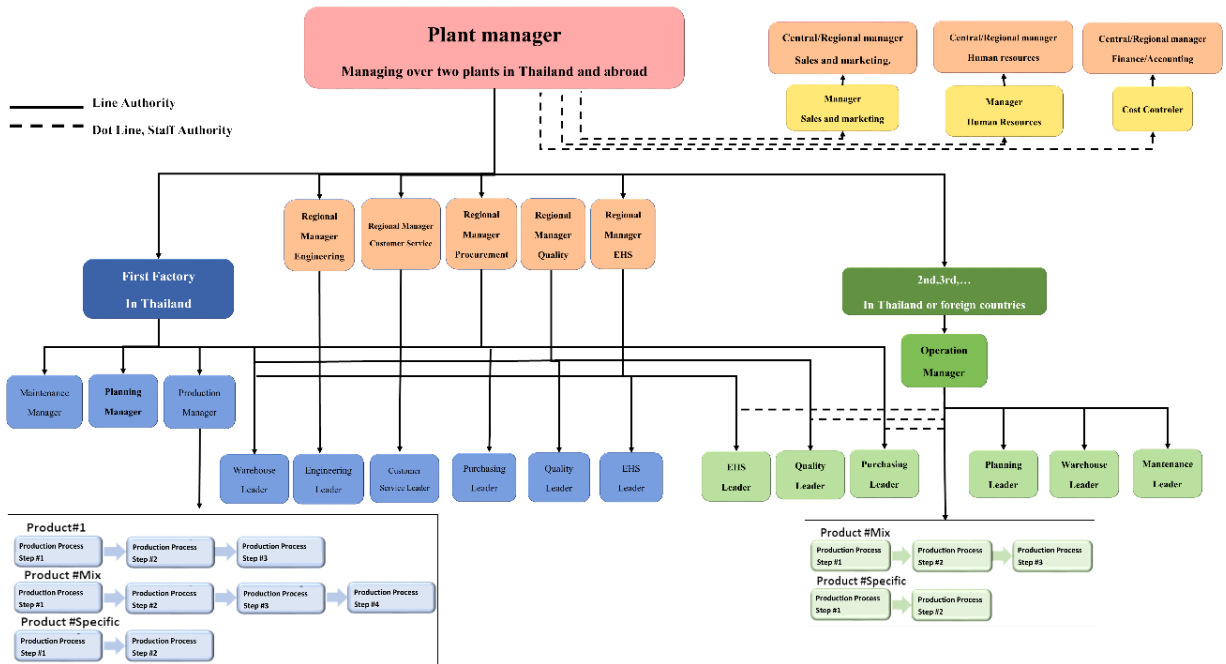


Figure 4 Effective and efficient organization structure model for management of multiple auto-parts plants in Thailand and abroad.

effectiveness from mixing products and specifying products production line. Matrix organizational structure and Line & Staff organization structure are more advance for cost efficient and effectiveness to manage manufacturing plants and/or oversea plant.

3.3 Regarding job descriptions in the model for management of multiple auto-parts plants in Thailand and abroad, duties and responsibilities are as follow:

**Plant manager or regional plant manager** is in charge of more than two manufacturing plants in Thailand and abroad, along with various managerial responsibilities.

**Regional department Manager** is in charge of a department of a group of two plants or more in Thailand and abroad, and report to the Plant manager.

**Department Manager** is in charge of a department within a single plant.

Section/Department Leader is subordinated to the department manager and reports to the department manager, regional department manager or the plant manager.

**Production staff** reports directly to the manager or production chief. Production is divided into lines

4. Rationale to use the current organization design and future restructuring trend.

- The sample experts use the current organization design and it is found that:

1. Restructuring to accommodate cost-cutting measures.
2. Restructuring to better suit the business type, focusing on agility and shallowness.
3. Emphasis on efficiency, clarity of duty, reduction of department, and reduction of confusions in duty.
4. Retention or application of the structure laid out by the organization’s policy and
5. Restructuring for future expansion or work.

- About main opinions and guidelines for future restructuring, it is found that the organization:

1. Focus on restructuring to improve efficiency, change duties and reduce confusion.
2. Restructure itself according to business strategy or to prepare for management of new plants or products.
3. Emphasizes structural agility, reducing depth and cost.
4. Restructure itself in accordance with central policy or direction and
5. Merge international positions or duties.

## Discussion

1. Organization design management per the research objective found that in the study hybrid design was used, which was derived from functional, production, matrix and line & staff. Real-life application of mixed theoretical design could be confirmed, agreeing with (Barraza, 2018; Lewis, 2011; Joseph, 2011; Homan, 2015; Roberson, 2016).

2. The model for management of multiple auto-parts plants in Thailand and abroad as actually used by the organization is similar to the Hybrid design theoretical structure which is formed by mixing various theoretical designs together. Difference from the theoretical design, however, was that hybridization focused on production process rather than business duty, which concurred with Yomjinda & Yomjinda (2018). Functional design grouped staff members based on their specialized assignments but their responsibilities were expanded to cover both Thai and foreign plants. Line & staff design has primary and secondary chain of command to accommodate future expansion in agreement with Schiefen (2010). Geographic design has expansion of some duties' coverage in both Thai and foreign plants, with some differences as the theoretical design focuses more on sales and marketing (Stephen & Timothy, 2007), while being more similar to Chucheeep (2016). Modular design structures the organization like border expansion with a parent company or main plant supervising child companies/plants. Also, the Virtual design is built on internal and external networks, probably for establishing a new plant. This design is usually temporary and will be restructured after plant establishment is complete.

## Suggestions

### 1. Suggestions on main objectives and theories:

The study found that suggestions for main objectives and theories are:

1.1 The organization design confirmed that competence of the leader in managing the organization design has an impact on efficient and effectiveness of the organization structure.

1.2 The organizational structuring design confirms the mixing of theory organizational structuring forms.

1.3 An automotive part management methods of plant managers to manage Thai-Oversea manufacturing parts found the forming from 4 theories of organization structure namely Function organizational structure, Production process organization structure, Matrix

organizational structure, and Line & Staff organization structure are more advance in efficient and effectiveness.

### 2. Suggestions on application for auto-parts plants restructuring:

The study found that suggestions for organizational management of over two plants in Thailand and abroad are:

2.1 Organization design from the research process might have issues with Thai organizations that are unfamiliar with, as they have similar structure with the first factory with the merging of some job positions, and complexity in the second or expanded plant.

2.2 This organization guideline can be used as a guideline or model but some adaptation must be made to fit the design with policy, management, goal and target of each organization.

2.3 There might be changes like creating a position above the plant manager, like director or regional plant manager.

2.4 Dot line or staff authority management style remains effective for cost-saving and resource sharing between plants or departments such as procurement, quality and safety.

2.5 Organizations with regional structure is more complex and requires readiness in capabilities and skills, along with clear direction setting, reporting, communication. All procedure must be clear and systematic.

2.6 Limitations and warnings: the model structure put forth in this study has some limitations and warnings for some issues like use of Dot line, as despite its increasingly common use, Dot line approach has some problems and is inconsistent with the principle of having only one superior. In addition, organizational structure in the second or third plants is more temporary and thus some managers or departments are not ready to procure or hire new resources for those new positions.

### 3. Research suggestions

3.1 This study is a part of the main research on a model for management of multiple auto-parts plants in Thailand and abroad with effectiveness and efficiency.

3.2 The model is based on an application guideline which more trial is needed.

3.3 Hybridization of any of the mentioned 20 theoretical designs still have issues about effective integration/hybridization, which warrants further studies.



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