The Study of Factors Affecting the Application of Theories for Inventory Management of Auto- Parts Manufacturing Companies

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Abstract

The aim of this research is to study the factors that affect theories applied to the inventory management of auto- parts manufacturing companies. The sampling group was the executives who were responsible for inventory management of 342 auto-parts manufacturing companies located in industrial estates of Bangkok, Samut Prakan, and Eastern areas. The research instrument was the 5-point Likert scales questionnaire. The data were analyzed by a statistical analysis software program for percentage, mean, standard deviation, and factor analysis.

From the factor analysis, the factors that affected the theoretical application to the inventory management of auto- parts manufacturing companies consisted of 10 factors including organization awareness, organizations' internal cooperation, supports from their organization and colleagues, knowledge management system, organization culture, importance of workers, organization's quality and management, workers' skills , knowledge application, and receiving skills.

The operation that applied the knowledge from theories to inventory management needed to consider the operation of the entire system simultaneously. The operation should not be done part by part because each part worked relatedly to each other and supported each other. Therefore, the operation of only one particular part not only made the management fail, but companies may also lose their capital cost and time as well as their workers' spirit and will power.

Keywords: Applied Theories, Inventory Management, Factor Analysis

Introduction

Inventory management has been an important key for organization management in any manufactures as it helps them to make important decision, gain more benefits, cut the cost and still be able to satisfy customers. Zappone (2006) addresses that minimizing the cost mainly relates to inventory and also the study of inventory has the main aim to help a company save the large amount of money. Closs (1989) asserts that with reliable and effective inventory control, a company could be able to lower the cost and stay in competitive with other companies.

Inventory management has gained more attention for quite a long time. Hadley and Within (1964) state that to cope with the inventory management, inventory theory was an important tool. They explain that traditionally, the inventory theory was developed from a construction of a mathematical model. Various inventory theories were developed and the obstacles of applying the theories in real-life situation were investigated to help the inventory managers dealing with different kinds of situations.

An organization could gain many benefits from a good inventory control system. Clodfelter (as cited by Mpwanya, 2005) addresses that a good inventory control system could maintain the balance of sales and inventory to avoid being overstocked or understocked. It provides information that identifies slow-selling and best seller merchandises so that companies could plan in advance what they would do with those merchandises. Besides, a good inventory control system could also indicates shortages and shrinkage of merchandises and finally reduce employee shoplifting.

Nowadays, there are many more companies and more competition. Advanced technology is created all the time. Customer demands are not the same. Therefore, companies need to act quickly to these changes (Ortegan & Lin, 2004). Inventory management theories play a more important role as a solution to inventory's problems. Many inventory management theories and models have been created such as reorder point (r), Economic Order Quantity (EOQ), Just-In-Time, Deterministic Control theory, or 2BIN.

Each theory or model was designed to serve different purposes. For example, the reorder point model was designed to help a manager making a decision when to reorder and how much to reorder (Braglia, Gabbrielli, & Zammori, 2013). The reorder point model is related to EOQ. Schwarz (2005) states that EOQ is the "cost-minimizing order-quantity" (pp. 135). It comes in a position to help making a decision how much to reorder. It involves with the cost of ordering and storage. If a company orders a lot of merchandises at a time, it could save time and money on ordering but pay more on storage. In vise versa, a company could save money for storage if fewer merchandises, but pay more money and spend more time to reorder. Therefore, EOQ comes in to help making the decision of ordering the merchandises by considering the customer demands.

Just-In- Time (JIT) is another widely used theory for inventory management. Olhager (2002) states that JIT has been used for the last two decades starting from 1980s. JIT refers to "resource utilization, that is, units of material, subassemblies, and components arrive in a manufacturing setting "just in time" for their use" (Singh, Singh, Mand, & Singh, 2013, pp. 86). That means suppliers deliver merchandises to

manufactures just in time for the production and manufactures produce just the right amount for the customer demands. The main aim of JIT is to reduce lead-time and lot size (Olhager, 2002). Therefore, the delivery speed would be improved and there would be no waste of merchandises in the stock. Or it would say that the main aim of JIT is zero lead-time, zero inventory, and zero failures.

Statement of the problem

With the rapid changes of the society, the customer demands are changed along with the advancements of technology. Companies need to adapt themselves to fulfill customer need and to cope with the hi-technology. Inventory management plays a crucial role in all kinds of manufacturing companies. However, it is very critical how a company would deal with its inventory management various theories have been designed to solve different problems that could happen in a company. A company needs to wisely choose inventory theories or methods that are appropriated to them. Thus, the application of inventory theories has played a major role in the company success. However, the problem that was found, especially in Thailand, is that many companies are still facing with the problems of an empty stock or too many supplies in stock. One main reason that causes them the problems is that those companies do not pay attention to apply an inventory management theory in the real-life situation even though their executives and employees have all the knowledge of the theories. Therefore, this aspect has come to the researchers' attention if there any factors that could be a barrier holding them to not apply their knowledge of inventory management theories to their works.

Furthermore, this present study focused on auto-parts manufacturing industry because it is one of the largest industry in Thailand. In year 2010, it brought profits to Thailand about $13.37 billion which was ranged in second of top ten export products of Thailand (Thailand Board of Investment, 2010). Thailand is also known as the Detroit of Asia as it is the South East Asia's largest and most advanced automotive industry (Nag, Banerjee, & Chatterjee, 2007). Automobile industry is a strategic target for developing countries like Thailand and the auto-parts industry is the value added for the whole automobile industry (Takahashi, 2001). Thailand is the biggest automobile market in ASEAN region that offers attractive incentive and flexible economic policy to attract the foreign investment. The industry needs to have enough quality workforces to handle its growing. For example, in year 2012, with the goal to produce 2 – 2.1 million cars, Thai auto-parts industry plans to hire 30,000 – 40,0000 employees more in order to reach the year's goal (National News Bureau of Thailand, 2012).

The auto-parts manufacturing industry is the industry in Thailand that hire the largest number of Thai employees with various profession. A major problem that usually happens in the auto-parts manufacturing industry is the inventory management problem because the employees need to deal with many big and small parts of automobile. It is quite a hard work to manage their stock and fulfill the customer demand. As a result, to solve the problem, the auto-parts manufacturing companies should apply an inventory management theory that is suitable to their situation. However, the problem is the company seems to be reluctant to apply those theories. Consequently, it would be worth to investigate what factors that cause this immediate problem.
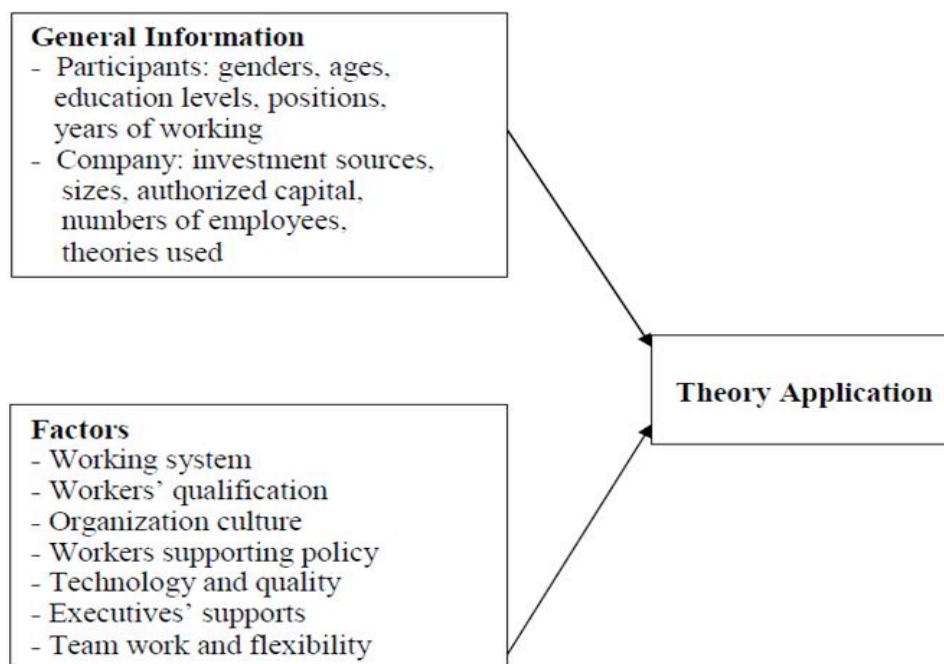
Research objective

The study aims to investigate factors affecting the application of theories to inventory management of auto-part manufacturing companies.

Significance of the study

The study reveals the factors that affect the application of theories to inventory management of auto-part manufacturing companies as well as the opinion of companies' executives on those factors. Moreover, the results of the study could be used as a guide to improve and develop the inventory management system of the auto-part manufacturing companies.

Framework of the study

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┌─────────────────────────────────┐
│ General Information             │
│ - Participants: genders, ages,  │
│   education levels, positions,  │
│   years of working             │
│ - Company: investment sources,  │
│   sizes, authorized capital,    │
│   numbers of employees,         │
│   theories used                │
└─────────────────────────────────┘
                                    ┌──────────────────────┐
                                    │  Theory Application  │
┌─────────────────────────────────┐ └──────────────────────┘
│ Factors                         │
│ - Working system               │
│ - Workers' qualification       │
│ - Organization culture         │
│ - Workers supporting policy    │
│ - Technology and quality       │
│ - Executives' supports         │
│ - Team work and flexibility    │
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Research Methodology

1. Participants

The participants were the executives including supervisors, assistant managers, and managers from 342 auto-part manufacturing companies located in industrial estates of Bangkok, Samut Prakan, and Eastern areas. Systematic random sampling was used to select the samples from 1,831 auto-part manufacturing companies.

2. Research Instrument

The research instrument was a 5 point-Likert scale questionnaire ranging from; 1 means the least affect, 2 means rarely affect, 3 means moderate affect, 4 means much affect, and 5 means the most affect. The questionnaire consisted of three parts. The first parts was the general information of participants and their companies including their gender, age, education levels, current position, years of working, company size,

numbers of employees, authorized capital, and investment sources. The second part was the items on factors affecting the application of theories to inventory management. The last part was an open-ended question that allowed participants to add more suggestions and comments.

The questionnaire was developed by first identifying the objective and content. The content was developed based on the framework of the study. The questionnaire was examined for its content validity by three experts to find the index of item objective congruence (IOC). Then the questionnaire was revised and tried in order to find its reliability. Cronbach's alpha coefficient was used to analyze the data. The questionnaire was revised again before its actual use. Finally, the main part of the questionnaire (the second part) contained 42 items divided into 7 parts or 7 different factors. Those were operation systems (6 items), employees' qualification (5 items), organization culture (10 items), employee supporting policy (11 items), technology and quality (3 items), executives' supports (2 items), team work and flexibility (5 items).

3. Data collection and data analysis

The researchers needed to collect the data from at least 328 companies and were aware that not all companies would be willing to participate. Therefore, the questionnaire was distributed to 1,000 auto- parts manufacturing companies. Finally, 342 companies participated and replied the questionnaire. Then the data were analyzed using descriptive analysis and factor analysis.

Results

From the first part of questionnaire, Table 1 below demonstrates the basic data of all participants including their companies' basic information. The information from this part could be an important factor that affected other factors in this present study.

Table 1: Participants' General Data

	Participants' data	Total No.	%
Gender	Male	205	59.9
	Female	137	40.1
Age	Younger than 25	20	5.8
	25-30	70	20.5
	31-35	122	35.7
	36-40	67	19.6
	Older than 40	63	18.4
Years of Working	Less than 5 years	106	31.0
	5-10 years	148	43.3
	11years and over	88	25.7
Education Levels	Lower than Bachelor Degree	31	9.1
	Bachelor Degree	205	73.1
	Higher than Bachelor Degree	61	17.8
Position	Supervisor	173	50.6
	Assistant manager	96	28.1
	Manager	73	21.3
Investment Sources	100 % Thai	80	23.4
	Some investment from foreigners	262	76.6
Authorized Capital	Less than 30 million baht	54	15.8
	31-50 million baht	56	16.4
	51-100 million baht	64	18.7
	101-150 million baht	43	12.6
	151-200 million baht	41	12.0
	201million baht or over	84	24.6
Company size	Large	101	29.5
	Medium	178	52.0
	Small	63	18.4
No. of Workers	Less than 10	22	6.4
	10-29	25	7.3
	30-49	30	8.8
	50-99	72	21.1
	100-299	75	21.9
	300 or over	118	34.5

From Table 1, most executives are at the ages of 31-35 years old (35.7%) and have worked for 5- 10 years (43.3%). They mostly have the Bachelor degree (7.1). For the companies, most of them have some investment from foreigners (76.6) and hold the authorized capital of at least 201million baht (24.6%). Most of them are medium size companies with at least 300 employees (34.5%).

Table 2 – Table 5 demonstrates the data of the different inventory management theories that are applied in the auto-parts manufacturing companies.

Table 2: The Application of Inventory Management Theories to Auto-Parts Manufacturing Companies

Inventory Management Theories	No. of companies	% of all companies
2 BIN	22	6.4
MRP	75	21.9
EOQ	68	19.9
ROP	32	9.4
JIT/TPS	109	**31.9**
Inventory Control System	124	**36.3**
Inventory Counting System	131	**38.4**

From Table 2, the inventory management theories that are mostly used by many companies are Inventory Counting System (38.4%), Inventory Control System (36.3%) and JIT/TPS (31.9%). The theory that is used the least is 2 BIN (6.4%).

Table 3: The Application of Inventory Management Theories to Auto-Parts Manufacturing Companies Classified by Company Sizes

Inventory Management Theories	Company Size	No. of companies	% of all companies
2 BIN	Small	9	8.9
	Medium	9	5.1
	large	4	6.3
MRP	Small	29	28.7
	Medium	36	20.2
	large	10	15.9
EOQ	Small	22	21.8
	Medium	33	18.5
	large	13	20.6
ROP	Small	13	12.9
	Medium	13	7.3
	large	6	9.5
JIT/TPS	Small	36	38.6
	Medium	65	**36.5**
	large	8	12.7
Inventory Control System	Small	42	**41.6**
	Medium	56	31.5
	large	26	41.3
Inventory Counting System	Small	37	36.6
	Medium	61	34.3
	large	33	**52.4**

When classified by the company size, the inventory management theory that is used most in the large company size is Inventory Counting System (52.4%). The theory used most in the medium company size is JIT/TPS (36.5%). The theory used most in the small company size is Inventory Control System (41.6%).

Table 4: The Application of Inventory Management Theories to Auto-Parts Manufacturing Companies Classified by Investment Sources

Inventory Management Theories	Investment Sources	No. of companies	% of all companies
2 BIN	100 % Thai	10	**12.5**
	Some investment from foreigners	12	**4.6**
MRP	100 % Thai	20	25.0
	Some investment from foreigners	55	21.0
EOQ	100 % Thai	22	27.5
	Some investment from foreigners	46	17.6
ROP	100 % Thai	14	17.5
	Some investment from foreigners	18	6.9
JIT/TPS	100 % Thai	22	27.5
	Some investment from foreigners	87	33.2
Inventory Control System	100 % Thai	28	35.0
	Some investment from foreigners	96	36.6
Inventory Counting System	100 % Thai	34	**42.5**
	Some investment from foreigners	97	**37.0**

When classified by the investment sources, the inventory management theory used most in companies with 100% Thai investment and some investment from foreigners is Inventory Counting System (42.5% and 37%). The theory used the least with 100% Thai investment and some investment from foreigners is 2 BIN (12.5% and 4.6%).

Table 5: The Application of Inventory Management Theories to Auto-Parts Manufacturing Companies Classified by Authorized Capital

Inventory Management Theories	Authorized Capital	No. of companies	% of all companies
2 BIN	Less than 30 million baht	3	5.6
	31-50 million baht	7	12.5
	51-100 million baht	3	4.7
	101-150 million baht	4	9.3
	151-200 million baht	3	7.3
	201million baht or over	2	2.4
MRP	Less than 30 million baht	5	9.3
	31-50 million baht	17	30.4
	51-100 million baht	10	15.6
	101-150 million baht	10	23.3
	151-200 million baht	8	19.5
	201million baht or over	25	29.8
EOQ	Less than 30 million baht	12	22.2
	31-50 million baht	14	25.0
	51-100 million baht	13	20.3
	101-150 million baht	9	20.9
	151-200 million baht	7	17.1
	201million baht or over	13	15.5
ROP	Less than 30 million baht	4	7.4
	31-50 million baht	5	8.9
	51-100 million baht	4	6.2
	101-150 million baht	4	9.3
	151-200 million baht	9	22.0
	201million baht or over	6	7.1
JIT/TPS	Less than 30 million baht	8	14.8
	31-50 million baht	15	26.8
	51-100 million baht	29	45.3
	101-150 million baht	17	39.5
	151-200 million baht	10	24.4
	201million baht or over	30	35.7
Inventory Control System	Less than 30 million baht	20	37.0
	31-50 million baht	21	37.5
	51-100 million baht	20	31.2
	101-150 million baht	13	30.2
	151-200 million baht	13	31.7
	201million baht or over	37	44.4
Inventory Counting System	Less than 30 million baht	23	42.6
	31-50 million baht	25	44.6
	51-100 million baht	25	39.1
	101-150 million baht	15	34.9
	151-200 million baht	8	19.5
	201million baht or over	35	41.7

Table 5 reveals that the companies with authorized capital of less than 30 million baht and 31-50 million baht mostly use Inventory Counting System (42.6% and 44.6%). The companies with authorized capital of 51-100 million baht and 101-150 million baht use JIT/TPS (45.3% and 39.5%). The company with authorized capital of 151-200 million baht and 201million baht or over uses Inventory Control System (31.7% and 44.4%).

From the data analysis showing in all tables, it could be assumed that Inventory Control System, Inventory Counting System, and JIT/TPS seem to be the theories that most companies apply to their inventory management. On the other hand, 2 BIN seems to be the least use in all types of auto-parts manufacturing companies.

To the research objective, the aim is to investigate factors affecting the application of theories to inventory management of auto-part manufacturing companies. The result shows that all seven factors affect the application of inventory management theories at a high level (mean = 3.51-4.50). The descriptive statistics related to the factors affecting the application of inventory management theories reported from the questionnaire was summarized in the Table 6.

Table 6: The Result of Factors Affecting the Inventory Management Theoretical Application to Auto-Parts Manufacturing Companies

Factors	N	Mean	Std. Deviation
Working systems	342	**4.2018**	.62000
Workers' qualification	342	4.1316	.64775
Organization culture	342	4.1930	.66161
Worker supporting policy	342	4.1988	.62330
Technology and quality	342	4.1930	.72099
Executives' supports	342	3.9766	.79922
Team work and flexibility	342	4.1784	.69796

From Tables 6, the mean scores show that all factors have an effect on the application of inventory management theories at a high level. The working systems have the most effect (mean=4.2018) and worker support policy comes to the second most (4.1988). Executive's supports are the least effect among all.

The result from the data collection was analyzed again using KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) and Bartlett's test of sphericity. The result indicated that Factor Analysis could be useful with the data.

In order to use factor analysis, firstly, the factors were extracted using PCA (Principle Component Analysis). The eigenvalues, variance, and cumulative variance are described in Table 7. The result revealed that instead of 7 factors, it became 10 factors including organization awareness, organizations' internal cooperation, supports from their organization and colleagues, knowledge management system, organization culture, importance of workers, organization's quality and management, workers' skills, knowledge application, and receiving skills. These 10 factors had the eigenvalues of 1.00 or higher. The sum of cumulative variance was 61.284%.

Table 7: Numbers of Factors, Eigenvalues, Variance, and Cumulative Variance

Factors	Eigenvalues	% of Variance	% of Cumulative Variance
1	3.877	9.231	9.231
2	3.360	8.000	17.232
3	3.313	7.888	25.120
4	2.833	6.745	31.864
5	2.678	6.376	38.241
6	2.385	5.678	43.919
7	2.196	5.229	49.147
8	2.008	4.781	53.928
9	1.608	3.828	57.756
10	1.481	3.527	61.284

VARIMAX was used as a rotation method to find the association factors and variables. All variables were associated with the factors. Table 8 – Table 17 demonstrate each factor and its variables.

Table 8: Factor 1: Organization Awareness

Item No.	Variables	Factor Loading
23	The organization and workers are sharing the same aims.	.658
18	Working as a team.	.637
24	Workers understand clearly what organizations want to be in the future	.594
21	Working together with creative thinking	.568
19	Leaders have holistic concepts that help to see the whole picture of operation systematically.	.551
38	The organization is aware of the importance of team working.	.510
32	The organization gives workers opportunities to improve themselves.	.450
	Eigenvalue = 3.877, % of Variance = 9.231	

The first factor is organization awareness consisting of seven variables. The factor loading is between .450 - .658. The eigenvalue is 3.877. All variables are important. In order to gain organization awareness, a company needs to pay attention to all variables and makes them happen. From the factor loading, the most important variable that a company needs to achieve first is the first one "The organization and workers are sharing the same aims." Then other variables could be done after.

Table 9: Factor 2: Organizations' Internal Cooperation

Item No.	Variables	Factor Loading
41	The organization can adapt to all changes.	.640
42	Workers can adapt to all changes.	.632
40	Members of organizations share ideas to support the organization in coping with any future situations in order to achieve the organizations' goal.	.558
33	All members can connect to each other through different kinds of technology.	.536
39	The organization is aware of the cooperation in working network.	.510
34	There is a suitable use of technology for all kinds of work.	.491
15	The organization builds and transfers knowledge that is useful to the work to its workers.	.463
Eigenvalue = 3.360, % of Variance = 8.000		

Organizations' internal cooperation is the second factor including seven variables. The variables have factor loading between .463 - .640. The eigenvalue is 3.360. Considering the factor loading, the most important factor is item no. 41 "The organization can adapt to all changes" which is needed to be done first.

Table 10: Factor 3: Supports from Organization and Colleagues

Item No.	Variables	Factor Loading
1	Working systems are correlated with your knowledge.	.727
2	Leaders support you in applying your knowledge to your works.	.679
4	To develop the organization, your organization has financial support for applying workers' knowledge to actual work.	.647
5	The organization provides technology that is able to support your knowledge.	.601
3	Your colleagues cooperate with you when you apply your knowledge to works.	.567
6	Your position supports the use of your knowledge.	.405
Eigen Value = 3.313, % of Variance = 7.888		

Supports from their organization and colleagues are the third factor that contains six variables. The factor loading of all variables is between .405 - .727. The eigenvalue is 3.313. The most important variable is "Working systems are correlated with your knowledge," and following by "Leaders support you in applying your knowledge to your works."

Table 11: Factor 4: Knowledge Management System

Item No.	Variables	Factor Loading
26	The organization is willing to build its own knowledge.	.661
25	The organization provides clearly solutions to deal with different problems	.655
20	Workers support each other by transferring knowledge to each other.	.577
28	The organization offers opportunities to workers to participate in setting the policies.	.515
Eigenvalue =3.313, % of Variance = 7.888		

The fourth factor is knowledge management system. The eigenvalue is 3.313. The variables in this factor include 4 variables. The variables have factor loading between .515 - .661. The most important one is "The organization is willing to build its own knowledge."

Table 12: Factor 5: Organization Culture

Item No.	Variables	Factor Loading
14	The organization culture supports the application of theories to the work.	.686
16	The organization and employees are sharing the same mission.	.579
12	The organization's atmosphere supports the application of theories to the works.	.512
13	The organization has a structure that supports the application of theories to the works.	.493
Eigen Value = 2.678, % of Variance = 6.376		

The fifth factor is organization culture including 4 variables. The variables have factor loading between .493 - .686. The eigenvalue is 2.678. The most important one is "The organization culture supports the application of theories to the work."

Table 13: Factor: 6 Importance of Workers

Item No.	Variables	Factor Loading
30	Employees' responsibility is flexible.	.612
31	The organization gives employees opportunities to be able to learn.	.565
27	The organization gives workers opportunities to learn new technology.	.471
17	The organization builds a strong viewpoint of cooperation among the whole organization employees.	.441
Eigen Value = 2.385, % of Variance = 5.678		

The sixth factor is importance of workers including 4 variables. The variables have factor loading between .441 - .612. The eigenvalue is 2.385. The most important one is "Employees need flexibility in their responsibility."

Table 14: Factor 7: Organization's Quality Management

Item No.	Variables	Factor Loading
35	The organization is consistently aware of the importance of quality management.	.649
37	The organization's atmosphere supports the development of working life quality.	.573
36	Executives give employees supports more than giving orders.	.506
	Eigen Value = 2.196, % of Variance = 5.229	

The seventh factor is Organization's Quality Management including 3 variables. The variables have factor loading between .506 - .649. The eigenvalue is 2.196. The most important one the needs to be done first is "The organization needs to be consistently aware of the importance of quality management."

Table 15: Factor 8: Workers' Skills

Item No.	Variables	Factor Loading
9	The years of working experience supports the application of your knowledge to your work.	.814
8	Your special profession supports the application of your knowledge to your work.	.715
10	The job security supports the application of your knowledge to your work.	.509
	Eigen Value = 2.008, % of Variance = 4.781	

The eighth factor is workers' skills with the eigenvalue at 2.008. This factor contains 3 variables. The variables have factor loading between .509 - .814. The most important one is "the years of working experiences that help them to apply their knowledge."

Table 16: Factor 9: Knowledge Application

Item No.	Variables	Factor Loading
7	Your education level supports the application of your knowledge to your work.	.572
29	The organization gives workers opportunities to solve their own problems	.569
	Eigen Value = 1.608, % of Variance = 3.828	

The ninth factor is Knowledge Application including 2 variables. The variables have factor loading between .569 - .572. The eigenvalue is 1.608. The factor loading of

these 2 variables are quite closed to each other; however, it would be better if workers have suitable level of education so that they can apply their knowledge to their work. Then a company can give them opportunity to solve problems in order to help them learn more and experience more.

Table 17: Factor 10: Receiving Skills

Item No.	Variables	Factor Loading
11	Your communication skill is an important obstacle in transferring knowledge to you work.	.572
22	You clearly understand about your own business.	.569
Eigen Value = 1.481, % of Variance = 3.5271		

The last factor is receiving skills. The eigenvalue is 1.481. The factor has 2 variables with factor loading at .569 and .572, respectively. It is clearly that workers need to have effective communication skills first and so they can better understand what they need to do.

Conclusion and Future Directions

From the frame work of seven factors that affected the application of inventory management theories of auto-parts manufacturing companies, all factors have high effect on the application. The most important one was "working systems" and "worker support policies" came to second. The least effect one was "executives' support."

After the data were analyzed for the factor analysis, the result revealed 10 factors instead of 7 factors. From the Eigen Value, it demonstrated which factor that needs to be considered as the most important and immediately done first. That was organization awareness, organizations' internal cooperation, supports from their organization and colleagues, knowledge management system, organization culture, importance of workers, organization's quality and management, workers' skills, knowledge application, and receiving skills. If a company aims to achieve the application of inventory management theories effectively as well as create an organization of learning, this study suggests that these ten affective factors needs to done orderly. Then it would help a company to save both time and costs.

Piromrean (2008) studied the internal factors that influenced the organization of learning of Metropolitan Electricity Authority of Thailand. She found that organization culture and organization environment had the most direct effect while leadership of organization executives had the most indirect effect on the workers. She also found that the application of technology seemed to be the least effect factor; however, it was still in the moderate level.

In order to motivate the application of inventory management theories in an organization and create the organization of learning, an organization should be aware of all affective factors, none of them could be ignored. Importantly, all factors should be considered as one single system as they are related and support each other.

Therefore, an organization needs to operate them at the same time, and if it is possible, they should be done orderly as mentioned even though the result might not be effective.

For the future research, the study could be done in other kinds of industry such as, electronic and electric as they are the second large industry in Thailand. Other industries that need to be studies could be computer, plastic, and food since there is still very few studies about theory application for these kinds of industry.

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