

Factors Affecting Storage and Distribution Development in OTOP Distribution Center Bangkok branch

Putthiwat Singhdong

Faculty of Business Administration,
Rajamangala University of Technology Thanyaburi,
Klong Luang, Pathum Thani 12110, Thailand

*Corresponding author's e-mail: putthiwat_s@rmutt.ac.th

Received: March 31, 2020

Revised: June 10, 2020

Accepted: July 31, 2020

Factors Affecting Storage and Distribution Development in OTOP Distribution Center Bangkok branch

Putthiwat Singhdong

Faculty of Business Administration,
Rajamangala University of Technology Thanyaburi,
Khlung Luang, Pathum Thani 12110, Thailand

*Corresponding author's e-mail: putthiwat_s@rmutt.ac.th

Abstract

The purpose of this research was to study demographic factors on the storage and delivery of OTOP distribution centers in Bangkok. To examine the factors that cause storage faults at OTOP distribution centers. This research considers how to improve workflow in storage and distribution, to increase efficiency in loading and delivery. The examples used in the study were, OTOP stored in the Bangkok metropolitan area at Ploenchit, Silom and Ramindra. We collected information from 250 suppliers by using a questionnaire. Statistics used in the descriptive analysis in data analysis of frequency, percentage, mean and standard deviation as well as factor analysis.

The research found that the Factors to select the location of the OTOP distribution center in Bangkok Overall 3.69, the highest level. Is the site of the shop influences being 3.79 then follow by the availability of

space to collect goods, Classification of goods has the area to count products., how to distinguish and prepare products for transportation, respectively. Furthermore, the sample group also focused on the factors in the storage and distribution of assets, including material management at 3.55, inventory control at 3.64, Order Average at 3.57 and factors related to moving and shipping to customers average at 3.54.

The results of the factor analysis showed the main factors affecting development, storage and distribution. These consisted of five factors, which can be summarized as follows. 1. Location of the warehouse 2 Material Safety Management, 3 Inventory control, 4 Factors related to orders and 5. Factors related to moving and distributing goods to customers.

Keywords: Storage, Distribution, OTOP

Introduction

One Tambon Project One Product (OTOP) is a government policy. To solve the economic problems at the foundation by generating income, creating jobs and expanding opportunities for people to produce OTOP to global standards. The Department of Community Development has been assigned to carry out the promotion of OTOP project. It has been organized to manage and promote marketing. (Chaiprapat, S.et al.,2008)

The OTOP distribution center in Bangkok still faces a shortage of skill development in the storage and distribution of excellent and systematic products, resulting in unnecessary costs incurred in inventory storage. Every step of the storage process is equally important. No part of it, is less important than another. Without this we will not be able to continue the business. Transport is one of the most common problems in storage. The issue of accuracy in storage. Picking And shipping is critical to the enterprise. When there is a mistake in the inventory room it will affect many parts and create a loss of opportunity (Aree D, 2005)

Therefore, the optimization of inventory management will benefit the OTOP distribution center in Bangkok. In this way the service can also save money. This research process has revealed it and we are consequently finding ways to prevent and improve the work and make inventory management more precise and efficient.

Research objective:

1. To study the key factors affecting the development of storage and distribution. Case study OTOP Storage and Distribution center in Bangkok
2. To examines the importance and adjust a group of factors affecting the development of storage and distribution factors at OTOP distribution center.

Materials and methods

Research on the subject. Factors affecting development, storage and distribution. The case study of OTOP distribution and distribution center in Bangkok. Quantitative Research refers to research aimed at facts and quantitative data. The use of numerical data as evidence of the accuracy of this information is discussed in this chapter. The researcher describes the methodology used to conduct the research study. The essence is as follows. The samples used in the study were cooperative training. Use of quantitative research. Quantitative Research is based on survey research and by the use of a questionnaire. It is a tool to collect data. There were 300 vendors in the OTOP distribution and distribution center in the Bangkok metropolitan area, namely Ploenchit, Silom and Ramindra. Research data was collected by using a random sampling technique. In this study, the sample size was determined using the Cochran confidence curve (Cochran, 1977).

The researcher conducted the data (Editing) by checking its completeness. A total of 300 datasets were processed. To determine the coding (Coding), specify the score that will be given to the code of the

query. Then record and process data using a computer program. Statistical Package for the Social Science for Windows (SPSS) Statistics used in data analysis includes descriptive statistics, frequency, percentage, to describe the general characteristics of the sample. Mean and standard deviation to explain the importance of shop agents distributed in OTOP distribution centers in Bangkok and inferential statistics to analyse factors affecting the development, storage and distribution. The case study of OTOP distribution and distribution center in Bangkok. The Factor Analysis is as follows.

The researchers are applying Factor Analysis technique to analyse the data to explain the significance of each factor. The researcher considers the variables that are expected to affect the factors. Development, storage and distribution A case study of OTOP distribution centers in Bangkok metropolitan area, consisting of 6-factor elements, a location of warehouses, six variables, five factors of material management, five factors of inventory control, there are five variables and 13 factors of transportation and distribution. Quantitative Factor Analysis can be used to group variables that are related together. The factor j can be estimated.

Results and discussion: The factors affecting storage and distribution development in OTOP distribution center bangkok branch

PART1 Analyze the importance of the factors that influence the development, distribution and storage, of OTOP case study in Bangkok. Among the sample of respondents from a total of 250 stores, collect from shop Ploenchit shop for 87 stores by 34.4 per cent, Silom at 77 per cent

from 35 suppliers to analyze the relative importance of the factors that influence the development of storage. As 5 section as table below

Table 1 The Dimensions affecting storage and distribution development in OTOP distribution

Factors	Average	S.D	Level
1.Inventory Location and Warehousing	3.69	1.049	High
2.Material Handling	3.53	1.024	High
3.Inventory Control	3.64	.988	High
4.Order Processing	3.57	1.013	High
5.Moving and distribution product to customers	3.54	1.070	High

PART 2 Analysis of factors distressing the development, distribution, storage at distribution centers, at OTOP Bangkok.

Variables Affecting Factors affecting the storage and distribution centers development, and delivery of OTOP case study in Bangkok. The research has been conducted of all 34 variables by using factor analysis are detailed below.

Table 2 Factors affecting storage and distribution development, Case Study of OTOP Distribution Center.

No.	Factors Explanation
1	X1 Location of shop
2	X2. Space for receive goods
3	X3 classification of goods
4	X4 Area for checking goods
5	X5. Sufficient place for distribution
6	X6. How to distinguish and prepare products for transportation.
7	X7. Choosing the right equipment for moving goods.
8	X8. Effective use of equipment and tools.
9	X9. Equipment used to move goods.
10	X10. Age of equipment and tools used to move.
11	X11. The number of storage devices is sufficient for the movement.
12	X12. How to check the product.
13	X13. The form of data entry and exit of goods.
14	X14. Planning to control the size and type of goods in the right quantities.
15	X15. The time is taken to check the stock.
16	X16. A frequency of data entry and exit.
17	X17. Planning to order goods for storage and distribution.
18	X18. Procedures for the preparation of trading documents.
19	X19. Preparation period for the preparation of trading documents.
20	X20. The language used in the order.
21	X21. The quantity of work in the goods receipt and goods delivery.

No.	Factors Explanation
22	X22 Type of goods to be transported and distributed.
23	X23. Types and types of transportation and distribution.
24	X24 Vehicles used for transportation and distribution.
25	X25Age of vehicles used for transportation and distribution.
26	X27. How to distinguish and prepare products for transportation.
27	X28 Distance in moving goods
28	X29 Size of picking/picking unit
29	X30. Reversal of Moving Equipment / Transportation
30	X31. Support to improve work processes.
31	X31. Better exposure to new technologies such as RFID or barcode software to plan distribution.
32	X32. Development of the quality of packaging standards.
33	X33. Reduction of picking, picking, moving with the use of appropriate equipment.
34	X34. Use of logistics services by external experts.

Table 3 Bartlett'sd Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.939
Bartlett's Test of Sphericity	Approx. Chi-Square	6432.722
	Df	561
	Sig.	.000

This found that the Kaiser - Meyer - Olkin is more significant than 0.5, indicating that the information is appropriate to use Factor Analysis to

analyze the data and found that Bartlett's Test of Sphericity The Significance of less than 0.05 indicates that the variables are related. Factor Analysis techniques can be used to analyze the data.

Table 3 Communalities

Variables	Initials	Extraction
X1	1	0.656
X2	1	0.665
X3	1	0.703
X4	1	0.71
X5	1	0.682
X6	1	0.627
X7	1	0.806
X8	1	0.777
X9	1	0.796
X10	1	0.711
X11	1	0.729
X12	1	0.601
X13	1	0.602
X14	1	0.641
X15	1	0.634
X16	1	0.706
X17	1	0.578
X18	1	0.642
X19	1	0.614
X20	1	0.596
X21	1	0.693

Variables	Initials	Extraction
X22	1	0.426
X23	1	0.622
X24	1	0.713
X25	1	0.747
X26	1	0.76
X27	1	0.631
X28	1	0.609
X29	1	0.589
X30	1	0.605
X31	1	0.752
X32	1	0.703
X33	1	0.674
X34	1	0.65

Extraction Communalities found that the variant of the X22: the type of goods to transport and distribution, with a minimum of 0.426, which is considered very low. It also can be a factor in any one factor.

Table 4 Total Variance Explained.

comp onent	Initial Eigenvalues			Extraction Sum of Squared Loadings			Rotation of Sums of Squared Loadings		
	Total	% of Varian ce	Cumu lative %	Total	% of Varian ce	Cumu lative %	Total	% of Varian ce	Cumu lative %
1	15.440	45.412	45.412	15.440	45.412	45.412	6.054	17.806	17.806
2	2.459	7.234	52.646	2.459	7.234	52.646	5.146	15.137	32.943
3	1.880	5.529	58.175	1.880	5.529	58.175	4.039	11.878	44.821
4	1.478	4.348	62.522	1.478	4.348	62.522	3.902	11.478	56.299
5	1.420	4.177	66.700	1.420	4.177	66.700	3.223	9.478	65.777
6	1.012	2.976	69.676	1.012	2.976	69.676	1.326	3.899	69.676
7	0.902	2.653	72.328						
8	0.771	2.268	74.596						
9	0.694	2.042	76.639						
10	0.646	1.899	78.538						
11	0.620	1.824	80.362						
12	0.531	1.563	81.925						
13	0.487	1.432	83.357						
14	0.469	1.379	84.736						
15	0.451	1.327	86.062						
16	0.431	1.267	87.329						
17	0.387	1.138	88.468						
18	0.362	1.066	89.533						
19	0.348	1.022	90.556						
20	0.331	0.974	91.530						
21	0.322	0.947	92.477						
22	0.293	0.863	93.340						
23	0.284	0.836	94.176						
24	0.264	0.776	94.952						
25	0.230	0.677	95.629						
26	0.209	0.616	96.245						
27	0.196	0.576	96.821						

comp onent	Initial Eigenvalues			Extraction Sum of Squared Loadings			Rotation of Sums of Squared Loadings		
	Total	% of Varian ce	Cumu lative %	Total	% of Varian ce	Cumu lative %	Total	% of Varian ce	Cumu lative %
28	0.193	0.567	97.388						
29	0.181	0.532	97.920						
30	0.163	0.479	98.399						
31	0.163	0.478	98.877						
32	0.135	0.398	99.275						
33	0.134	0.393	99.668						
34	0.113	0.332	100.00 0						

The Component or variable at 1-6, only to have the Eigenvalues more significant than 1, so there are only 6 Factor primordial factors that affect the development, storage, and distribution of educational centres and distribution of OTOP in Bangkok goods. The first is that the variable factors that are most important. The variance of

the variables have the most up to 17.806% Factor 2 to 6 will have priority, followed by variable two and variation of a variable equal to 15.137%, 11.878%, 11.478%, 9.478% and. 3.899%, respectively, which included six variables that could explain the variability of the variable equal to 69.676%

Table 5 Rotated Component Matrix

Variables	Component or Factor					
	1	2	3	4	5	6
1	.263	.155	-.154	.722	.097	.019
2	.094	.185	.113	.791	-.026	.031
3	.229	.223	.143	.664	.329	.055
4	.216	.032	.263	.765	.131	.078
5	.191	.017	.344	.732	.113	.024
6	.358	.169	.361	.554	.205	.015
7	.224	.322	.762	.167	.164	.148
8	.265	.294	.752	.158	.155	.085
9	.239	.260	.797	.166	.130	.025
10	.283	.244	.669	.216	.274	.100
11	.377	.289	.581	.244	.273	.182
12	.622	.157	.174	.257	.303	.308
13	.619	.110	.225	.195	.278	.396
14	.670	.117	.221	.268	.193	.236
15	.661	.236	.183	.251	.172	.152
16	.646	.302	.181	.281	.224	.154
17	.611	.275	.261	.154	.230	.027
18	.692	.193	.352	.121	.199	.152
19	.697	.296	.268	.084	.178	.191
20	.723	.059	.033	.183	-.098	.069
21	.690	.415	.175	.152	.000	.089
22	.184	.486	.225	.090	.056	.635

Variables	Component or Factor					
	1	2	3	4	5	6
23	.174	.645	.222	.086	.175	.488
24	.084	.757	.245	.131	.140	.245
25	.138	.764	.270	.073	.221	.128
26	.322	.773	.186	.152	.099	.037
27	.413	.635	.068	.142	.114	.043
28	.415	.576	.229	.178	.185	.001
29	.283	.591	.250	.151	.298	.038
30	.455	.127	.093	.168	.597	.128
31	.066	.102	.197	.078	.787	.174
32	.206	.251	.128	.136	.737	.013
33	.136	.476	.319	.161	.578	.124
34	.111	.476	.232	.253	.542	.172

The tables show that Factor loading when the rotation factors by Varimax and the factors that influence the development, storage, and distribution of educational centers and distribution of OTOP in Bangkok include 6 Factor as before, but they are variable changes from one group to another group by a factor. Factor 1 is an important variable factor and is the one that matters most. Variance of the variables have the most up to 17.80% Factor 2 to 6 will have priority, followed by variable 2 and variance of a variable equal to 15.14%, 11.88%, 11.48%, 9.48% and. 3.89%, respectively, which included six variables that could explain the variability of the variable equal to 69.676%, which includes a Factor 6.

Factor 1 Distribution factor

1. X12. How to check the product.
2. X13. The form of data entry and exit of goods.
3. X14. Planning to control the size and type of goods in the right quantities.
4. X15. The time is taken to check the stock.
5. X16. A frequency of data entry and exit.
6. X17. Planning to order goods for storage and distribution.
7. X18. Procedures for the preparation of trading documents.
8. X19. Preparation period for the preparation of trading documents.
9. X20. The language used in the order.
10. X21. The quantity of work in the goods receipt and goods delivery.

Factor 2: The factor from type of Transportation

1. X23. Types and types of transportation and distribution.
2. X24 Vehicles used for transportation and distribution.
3. X25 Age of vehicles used for transportation and distribution.
4. X27. How to distinguish and prepare products for transportation.
5. X28 Distance in moving goods
6. X29 Size of picking/picking unit
7. X30. Reversal of Moving Equipment / Transportation

Factor 3: The equipment used to move

- 1 X7. Choosing the right equipment for moving goods.
2. X8. Effective use of equipment and tools.
3. X9. Equipment used to move goods.

4. X10. Age of equipment and tools used to move.

5 .X11. The number of storage devices is sufficient for the movement.

Factor 4 Factor of Location

1. X1 Location of shop

2 .X2. Space for receive goods

3 X3 classification of goods

4 .X4 Area for checking goods

5 .X5. Sufficient place for distribution

6 .X6. How to distinguish and prepare products for transportation.

Factor 5: Support factors for technology used in the distribution

1. X31. Support to improve work processes.

2. X31. Better exposure to new technologies such as RFID or barcode software to plan distribution.

3. X32. Development of the quality of packaging standards.

4 .X33. Reduction of picking, picking, moving with the use of appropriate equipment.

5. X34. Use of logistics services by external experts.

Factor 6: Type of Product

X22 Type of goods to be transported and distributed.

Conclusions

The outcomes of the factor analysis showed the main factors affecting development, storage and distribution. These consisted of five

factors, which can be summarized as follows. 1.Location of the warehouse
2 Material Safety Management, 3 Inventory control, 4 Factors related to orders and 5. Factors related to moving and distributing goods to customers. Moreover, the factors affecting the storage and distribution development. The case study of OTOP distribution center in Bangkok. There are only 250 samples. Researchers expect that this research project can be applied to the regression analysis to find each variable's relationship. The mathematical model was used to predict the results. There may be many models for the development, storage and distribution of OTOP products in the Bangkok metropolis as well. OTOP Distribution Center in the region the future continues.

References

- Chaiprapat, S., Limsakul, B., & Sirivongpaisal, N. (2008). A feasibility study on establishing distribution centres for One Tambon One Product (OTOP) project in Songkhla Province. *International Journal of Integrated Supply Management*, 4(1), 34.
- Kitti L. (2005.). *Local Development Approaches. The people involved in the district*. Retrieved from <http://www.thaitambon.com>
- Malinee, L. (2007). *Factors affecting the decision-making behavior of silk products of Tambon project*. One consumer product in Nakhon Ratchasima Research, Nakhon Ratchasima Rajabhat University.

- Orapun, B. (2006). *Marketing strategy for pomelo, white cucumber under the One Tambon One Product Project*. Master Thesis, Development Strategies Branch, Nakhon Sawan Rajabhat University.
- Aree, D. (2005). *Development of a marketing strategy for one Tambon one product in Tak province*. Master's Degree in Master of Arts Strategic and Development Department College Kamphaeng Rajabhat University.
- Jeersak, T. (2010). *Study on the method of reducing waste in the process of disassembling the hard disk drive with DMAIC procedure. Case study Hitachi Global Storage Technology (Thailand); DMAIC Case Study: Hitachi Global Storage Technology* Thesis Industrial Management King Mongkut's University of Technology North Bangkok
- Veerappan, N. (2012). *The study of use dmaic tools to improve inventory accuracy: Case study of Dhlsupply Chain Branch SC Johnson & Sons*, (Master thesis). Burapha University, Thailand.
- Jirasukprasert, P., Garza-Reyes, J. A., Kumar, V., & Lim, M. K. (2014). A Six Sigma and DMAIC application for the reduction of defects in a rubber gloves manufacturing process. *International Journal of Lean Six Sigma*, 5(1), 2-21.
- Cheng, C. H., & Kuan, C. M. (2012). Research on product quality improvement by using the DMAIC process: A case study of cold cathode fluorescent lamp. *Asian Journal on Quality*, 13(1), pp.67-76.

- Mandal, P. (2012). Improving process improvement: improving the diagnostics and improving phases of DMAIC better. *International Journal of Lean Six Sigma*, 3(3), pp.231-250.
- Mishra, P., & Sharma, R. K. (2014). A hybrid framework based on SIPOC and Six Sigma DMAIC for improving process dimensions in supply chain networks. *International Journal of Quality & Reliability Management*, 31(5), pp.522-546.
- James, A. T., & Jerry, D. S. (1998). *The warehouse management handbook* (2nd eds.). Tompkins press, pp. 823-848.
- Petersen, C. G. (2002). Considerations in order picking zone configuration. *International Journal of Operations & Production Management*, 22(7), 793-805.