# IDENTIFYING LEAD INDICATOR FOR STRATEGY DEVELOPMENT: A CASE STUDY IN UTILITY EQUIPMENT MANUFACTURER

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**Abstract:**
Utility equipment industry is regarded as a foundation that plays an important role in people livelihood as well as economic development, Therefore, growth of Utility equipment industry is consistent with electricity demand in each year is depends on main factors that consists of population growth, industry growth and economic growth. In the past, electricity generation, electricity demand and the country GDP have been in the same direction. The electrical usage data for the period of 10 years from 2002 to 2012 was gathered in this study in order to forecasting the trends of usage level segregated by the user types; industry, agriculture, business, government and households. The lead indicators which can predict electrical demand are identified. It turns out that demand in industrial customer group leads overall demand and other demand of others customer group. In addition, detail about product characteristics which impact customer decisions in the utility equipment industry are price, quality, product variety, promotion, easy to find, on-time delivery, payment, technical supporting, innovation etc. The questionnaire was applied with 4P technique and Benchmarking to distributed to industry users. As a results, the proper strategy is formulated based on lead indicator in such that the market distribution at the first priority, and then follow by quality of product, on time delivery and after sales service in order to gain the higher sale performance and market share in the future in Thailand utility equipment industry.

*Keywords: lead indicators, strategy development, demand forecasting*

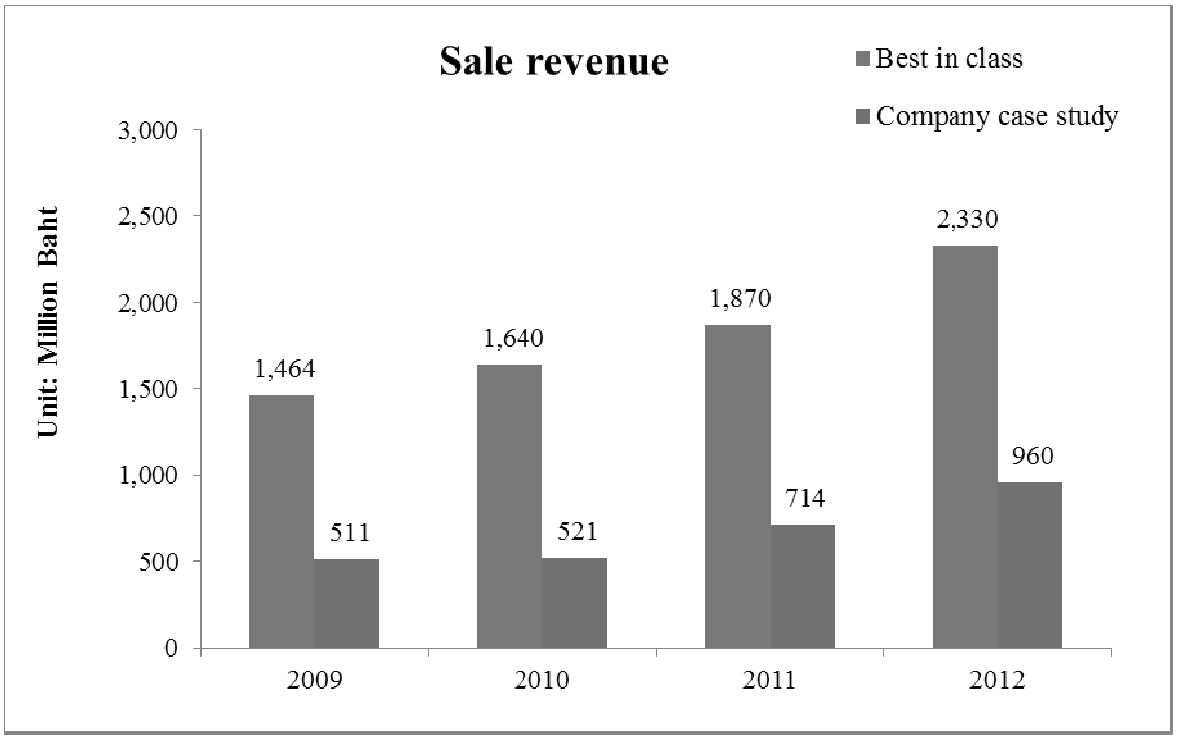
# 1. INTRODUCTION

According to the economic growth, population increasing, and many factors which contributed to the high demand of electricity of Thailand. Electrical product always growth with the high demand of electricity is the electrical transformer. Especially, the electrical transformer is more important on the industrial sector. In order to the statistic of the Energy Policy and Planning Office, Ministry of Energy, Royal Thai Government, industrial sector is the most consumption of the electricity.

Demand of Electricity is increasing in every years, product which related to the growth of electricity is also awareness on forecasting or prediction of the growth of their market. Electrical transformer is the one which most related to the electricity consumption. Fortunately, Thailand has at least three manufacturers of electrical transformer product in list of Thailand Stock Market, but it's very challenging to increase their market share on a high competitive environment such as high labor cost, Innovation, Global market, and ASEAN free trade etc. In addition, the industrial sector is the most of electricity consumption of Thailand (More than 40%). Then follow by the residential and so on..

The objective of this reeaech referred from a medium size company as a case company. A case company is a manufacturing of electrical transformer. However, this case company is not the best in class of market share in electrical transformer business. Thus this company wanted to establish a strategy to enhance their market share. The case company is facing a challenge task on the market share. Based on the sale revenue year 2009 to 2012 in Figure 1, Sale revenue of the company case study are lower than the leading company of electrical transformer product.

**Figure 1:** Sale revenue benchmarking between the Best-In-Class (BIC) and company case study, year 2009 – 2012




High competitive of the electrical transformer product, company case study would like to increase their sale, and market share. Thus they would like to provide strategic plan to competitive with the leading company. The problem statement of this study is "How to increase sale/market share?" The study would like to provide a strategic planning for increase the company case study's market share. The technique which are applied for establish the strategic plan are benchmarking, 4P, and SWOT analysis.

**Table 1**: Electricity consumption of Thailand, Year 2002 – 2012 (Unit: GWh)

| Year | Resident | Small & General Service | Business | Industrial | Government | Agri. | Other | Total |
|---|---|---|---|---|---|---|---|---|
| 2002 | 21,963 | 9,751 | 14,702 | 48,256 | 3,635 | 192 | 632 | 99,132 |
| 2003 | 23,330 | 10,343 | 15,767 | 51,845 | 3,701 | 228 | 690 | 105,903 |
| 2004 | 24,538 | 11,033 | 16,976 | 56,443 | 3,814 | 251 | 862 | 113,917 |
| 2005 | 25,482 | 11,894 | 17,781 | 59,669 | 3,848 | 249 | 1,052 | 119,976 |
| 2006 | 26,847 | 12,558 | 19,097 | 62,432 | 3,979 | 240 | 1,189 | 126,343 |
| 2007 | 27,938 | 13,207 | 19,991 | 64,553 | 4,230 | 268 | 1,304 | 131,490 |
| 2008 | 28,691 | 13,730 | 21,052 | 64,148 | 4,392 | 281 | 1,449 | 133,743 |
| 2009 | 30,257 | 14,342 | 21,347 | 60,880 | 4,677 | 318 | 1,517 | 133,338 |
| 2010 | 33,216 | 15,586 | 22,996 | 68,039 | 5,049 | 335 | 2,046 | 147,267 |
| 2011 | 32,799 | 15,446 | 23,660 | 67,942 | 4,888 | 297 | 1,655 | 146,687 |
| 2012 | 36,447 | 17,013 | 27,088 | 72,336 | 3,799 | 377 | 2,527 | 159,588 |

# 2. LITERATURE REVIEW

## 2.1 Trend estimation

Trend estimation is a statistical technique to aid interpretation of data. When a series of measurements of a process are treated as a time series, trend estimation can be used to make and justify statements about tendencies in the data, by relating the measurements to the times at which they occurred. By using trend estimation it is possible to construct a model which is independent of anything known about the nature of the process of an incompletely understood system (for example, physical, economic, or other system). This model can then be used to describe the behavior of the observed data.

Given a set of data and the desire to produce some kind of model of those data, there are a variety of functions that can be chosen for the fit. If there is no prior understanding of the data, then the simplest function to fit is a straight line with the data plotted vertically and values of time (t = 1, 2, 3, ...) plotted horizontally. Once it has been decided to fit a straight line, there are various ways to do so, but the most usual choice is a least-squares fit. This method minimizes the sum of the squared errors in the data series, denoted the y variable. Given a set of points in time, and data values observed for those points in time, values of and are chosen so that

$$\sum_t \{[(at + b) - y_t]^2\} \quad (1)$$

Whem (1) is minimized. Here at + b is the trend line, so the sum of squared deviations from the trend line is what is being minimized. This can always be done in closed form since this is a case of simple linear regression.

## 2.2 4P Technique

Borden (1965) claims to be the first to have used the term “marketing mix” and that it was suggested to him by Culliton’s (1948) description of a business executive as “mixer of ingredients”. An executive is “a mixer of ingredients, who sometimes follows a recipe as he goes along, sometimes adapts a

recipe to the ingredients immediately available, and sometimes experiments with or invents ingredients no one else has tried" (Culliton, 1948). The early marketing concept in a similar way to the notion of the marketing mix, based on the idea of action parameters presented in 1930s. Rasmussen (1955) then developed what became known as parameter theory. He proposes that the four determinants of competition and sales are price, quality, service and advertising. Mickwitz (1959) applies this theory to the Product Life Cycle Concept. Borden's original marketing mix had a set of 12 elements namely: product planning; pricing; branding; channels of distribution; personal selling; advertising; promotions; packaging; display; servicing; physical handling; and fact finding and analysis. Frey (1961) suggests that marketing variables should be divided into two parts: the offering (product, packaging, brand, price and service) and the methods and tools (distribution channels, personal selling, advertising, sales promotion and publicity). On the other hand, Lazer and Kelly (1962) and Lazer, Culley and Staudt (1973) suggested three elements of marketing mix: the goods and services mix, the distribution mix and the communication mix. McCarthy (1964) refined Borden's (1965) idea further and defined the marketing mix as a combination of all of the factors at a marketing manger's command to satisfy the target market. He regrouped Borden's 12 elements to four elements or 4Ps, namely product, price, promotion and place at a marketing manger's command to satisfy the target market.

## 3. METHODS

This part of the results to constructs a relationship between case company's sale performance and the total Thailand electrical consumption.

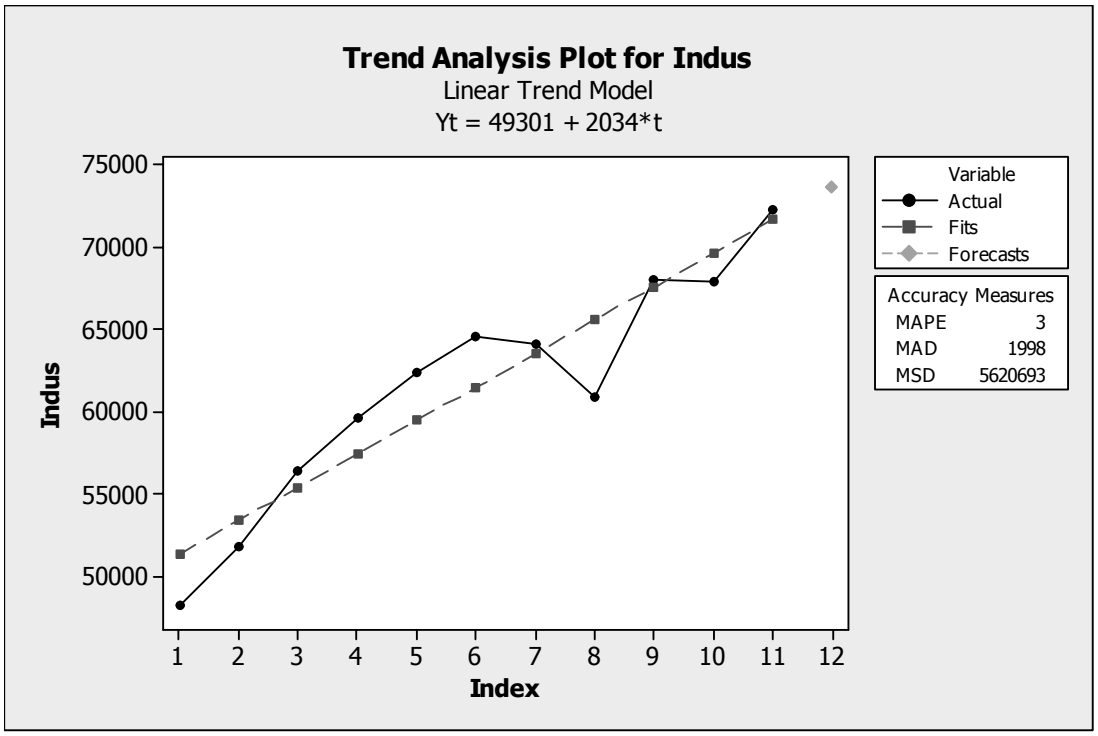
**Table 2:** Sale performance and the market share

| Year | Sale | Residential | Small General Service | Business | Industrial | Government and Non-Profit |
|---|---|---|---|---|---|---|
| **2002** | 15,069,425 | 21,963 | 9,751 | 14,702 | 48,256 | 3,635 |
| **2003** | 2,293,526 | 23,330 | 10,343 | 15,767 | 51,845 | 3,701 |
| **2004** | 82,998,620 | 24,538 | 11,033 | 16,976 | 56,443 | 3,814 |
| **2005** | 93,112,059 | 25,482 | 11,894 | 17,781 | 59,669 | 3,848 |
| **2006** | 46,947,402 | 26,847 | 12,558 | 19,097 | 62,432 | 3,979 |
| **2007** | 78,135,397 | 27,938 | 13,207 | 19,991 | 64,553 | 4,230 |
| **2008** | 35,850,977 | 28,691 | 13,730 | 21,052 | 64,148 | 4,392 |
| **2009** | 377,282,590 | 30,257 | 14,342 | 21,347 | 60,880 | 4,677 |
| **2010** | 400,567,546 | 33,216 | 15,586 | 22,996 | 68,039 | 5,049 |
| **2011** | 784,565,445 | 32,799 | 15,446 | 23,660 | 67,942 | 4,888 |
| **2012** | 685,660,252 | 36,447 | 17,013 | 27,088 | 72,336 | 3,799 |

The correlation among all market segments are tested. A result of correlation show as table 3. Based on correlation analysis, the factors that related with Sale at 95% Confident interval among Resident, Small general service, business, Industrial, and Agriculture. As a results, Industrial market segment has a high correation with sales and also other market segment. Therefore, the case company decided to focus on Industrial market in developing its strategy. Inaddtion, the multi regression is applied and shows the result only one factor which is remaining in the regression equation. The factor is Industrial sector, and R-square adjust is 69%.

**Table 3:** Correlation results among all market segment

| | Sale | Residential | Small | Business | Industrial | Government |
|---|---|---|---|---|---|---|
| **Residential** | **0.773** | | | | | |
| P-value | 0.005 | | | | | |
| **Small** | **0.808** | **0.995** | | | | |
| P-value | 0.003 | 0.000 | | | | |
| **Business** | **0.824** | **0.993** | **0.992** | | | |
| P-value | 0.002 | 0.000 | 0.000 | | | |
| **Industrial** | **0.847** | **0.933** | **0.949** | **0.947** | | |
| P-value | 0.001 | 0.000 | 0.000 | 0.000 | | |
| **Government** | **0.536** | **0.611** | **0.646** | **0.558** | **0.573** | |
| P-value | 0.090 | 0.046 | 0.032 | 0.074 | 0.065 | |
| **Agriculture** | **0.653** | **0.957** | **0.948** | **0.946** | **0.867** | **0.541** |
| P-value | 0.029 | 0.000 | 0.000 | 0.000 | 0.001 | 0.086 |



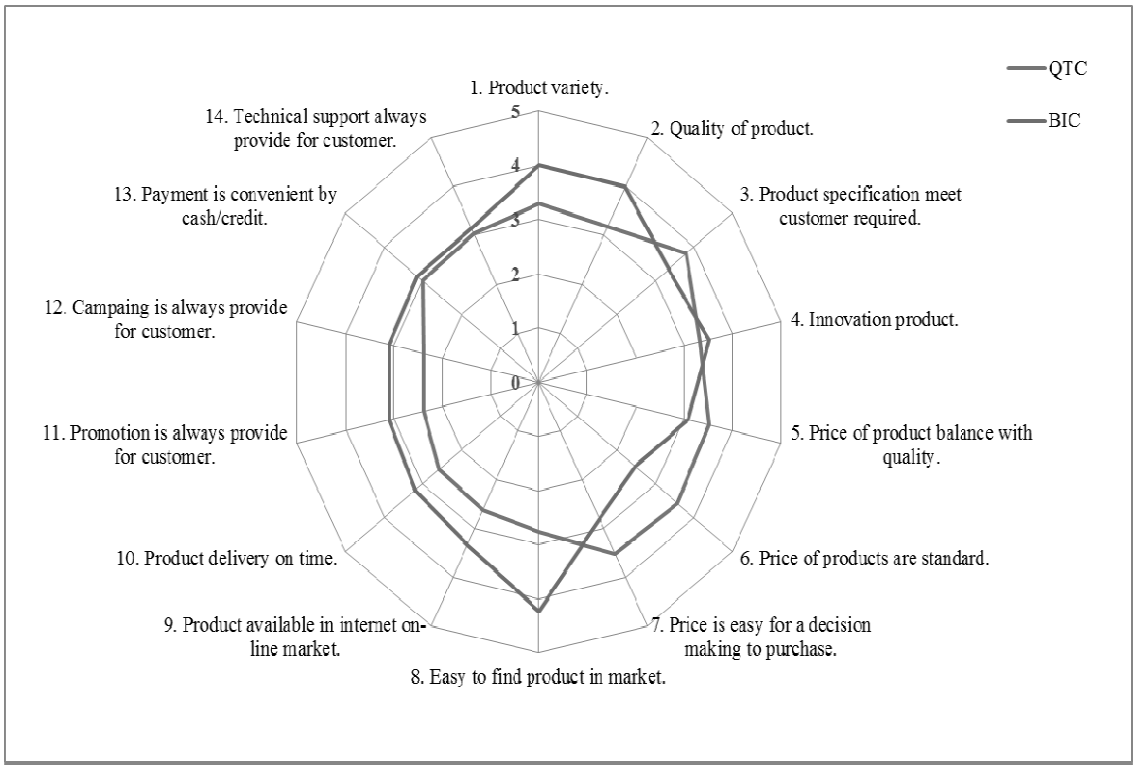

Then, the questionnaires were distributed to the Industrial sector customer. Total 21 customers manufacturing (Electronic 43%, Automobile 14%, Food 14%, and Other 29%) and they (Section manager 57%, Engineer 24%, Department head 14%, and Director 5%) return all questionnaires. The result as follow;

**Table 4**: Questionnaires results from Industrial customer

| 4P | Item | QTC | BIC | GAP Analysis |
|---|---|---|---|---|
| **Product** | 1. Product variety. | 3.2857 | 4.0000 | -0.7143 |
| | 2. Quality of product. | 3.1905 | 4.0000 | -0.8095 |
| | 3. Product specification meet customer required. | 3.8095 | 3.3333 | 0.4762 |
| | 4. Innovation product. | 3.3333 | 3.5238 | -0.1905 |
| **Price** | 5. Price of product balance with quality. | 3.5238 | 3.0952 | 0.4286 |
| | 6. Price of products is standard. | 3.5714 | 2.4762 | 1.0952 |
| | 7. Price is easy for a decision making to purchase. | 3.5238 | 2.8095 | 0.7143 |
| **Place** | 8. Easy to find product in market. | 2.7619 | 4.2381 | -1.4762 |
| | 9. Product available in internet on-line market. | 2.6190 | 3.3333 | -0.7143 |
| | 10. Product delivery on time. | 2.5714 | 3.1905 | -0.6190 |
| **Promotion** | 11. Promotion is always providing for customer. | 2.3810 | 3.0952 | -0.7143 |
| | 12. Campaign is always providing for customer. | 2.3810 | 3.0952 | -0.7143 |
| | 13. Payment is convenient by cash/credit. | 3.0000 | 3.1429 | -0.1429 |
| | 14. Technical support always provide for customer. | 3.0476 | 3.1429 | -0.0952 |

Based on the survey result, the company case study has topic “Price” higher than the best in class. On the other hand the rest 3P score (Product, Place and Promotion) are lower than the best in class, and the topic “Place” is the worse.

Graph comparison between company case study (QTC) and the best in class (BIC).




# 4. CONCLUSION

The following are the conclusion and the answer as the milestone of ""How to increase sale/market share?"

The objectives and the conclusion of this study are;

1) To focusing the high demand of electrical transformer customer group.

The result of regression and forecasting show the main customer is the industrial segment. Thus the company case study must more focus on the "Industrial group customer".

2) Apply benchmarking, 4P and SWOT analysis technique to increasing their sale performance, and market share.

The benchmarking, 4P and SWOT analysis result suggest that the company case study has strength point on price (Competitive advantage) and the weak point is marketing (Distribution channel, promotion, and campaign). On the other product variety, innovation and quality are the expectation of the industrial customer group.

3) To find factors that indicate Organization's market target.

The target market is the "Industrial customer group" and the factors which need to improve for enhance their market share as following ranking;

1. Easy to find product in market.
2. Quality of product.
3. Product variety.
4. Promotion is always providing for customer.
5. Campaign is always providing for customer.
6. Product available in internet on-line market.
7. Product delivery on time.
8. Innovation product.
9. Payment is convenient by cash/credit.

10. Technical support always provide for customer.

These ten factors are the score which the best in class has got score higher than the company case study. Then the company case study must improve on the market distribution channel at the first priority (Internet marketing also needed), and then follow by quality and innovation of product. Delivery also critical for the company case study, due date is very important. Because of all factors are the effective marketing and management without affecting the cost and do not discount. There are suitable method to increase market share and more sales. Finally service after sale is still needed for the customer especially on the “Industrial customer”. The company case study should be follow as the conclusion summary, then it will enhance on their sale performance and the market share in the future.

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