THE FACTORS THAT INFLUENCE THE BUYING DECISION MAKING OF A TRUCK SCALE SIZE 3X18 METERS BY CEMENT FACTORIES IN THAILAND

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Title: The Factors That Influence the Buying Decision Making of a Truck Scale Size 3x18 Meters by Cement Factories in Thailand

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Abstract

The objectives of this study was to investigate the relationship between the factor of Demographics (gender, level of position, job function), Accuracy, Database management, After-sales service, Reliability, Foundation, Legal for trade, Price, Trustworthiness influencing the buying decision making of Truck scale size 3x18 meters by a cement factory in Thailand.

This study focuses on the employees or staff who work in a cement factory and their job function is involved with the Truck scale. The participants in the study were a total of 184 people. The most convenient method of selection was applied to collect the data by first visiting the cement factory and handing out a hard copy of the questionnaire while requesting them to answer. The second method was to send the questionnaire by email and let them to fill in questionnaire. The third method was to create a questionnaire in Google Drive and send the link to the respondents to fill in the questionnaire online. The forth method was the researcher who presents speeches of the Truck scale subject to companies and had arranged a seminar about Truck scale technology. After finishing the seminar the researcher asked the attendees to fill in the questionnaire. The data collected from the surveys has been analyzed by applying the T-test and the F-test in the Data analysis programme.

The research findings indicated that the demographic factor did not influence the decision to purchasing Truck scale. The most factors that influenced buying a Truck scale and has some significance concerns the Truck scale foundation, the price, Database management, Truck scale supplier trustworthiness and Accuracy. The other factors included Reliability, After-sales service and Legal for trade. All of these factors have an influence with some significance but the second level did not influence as much as the first group.

Keywords: Buying Decision Making, 3x18 Truck, Cement Factor

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Nuttapong Faungfupong

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CHAPTER 1
INTRODUCTION

1.1 Statement of the Problems

Cement as a product in Thailand takes a very important role in the country because most of the infrastructure, houses, national road system and building construction have to use cement to be the main component structure. In Thailand the market trend of cement consumption, according to data from Thai fellowship of Cement Manufacturers, as shown in the chart below for scale of cement industry in 201,shows the total of cement production as 35,854,770,000 tons. Every single weight of cement has to be weighed on the Truck scale and therefore, this includes the raw material and other thing which have to pass through the Truck scale every day such as the fuel, coal, chemicals, etc.

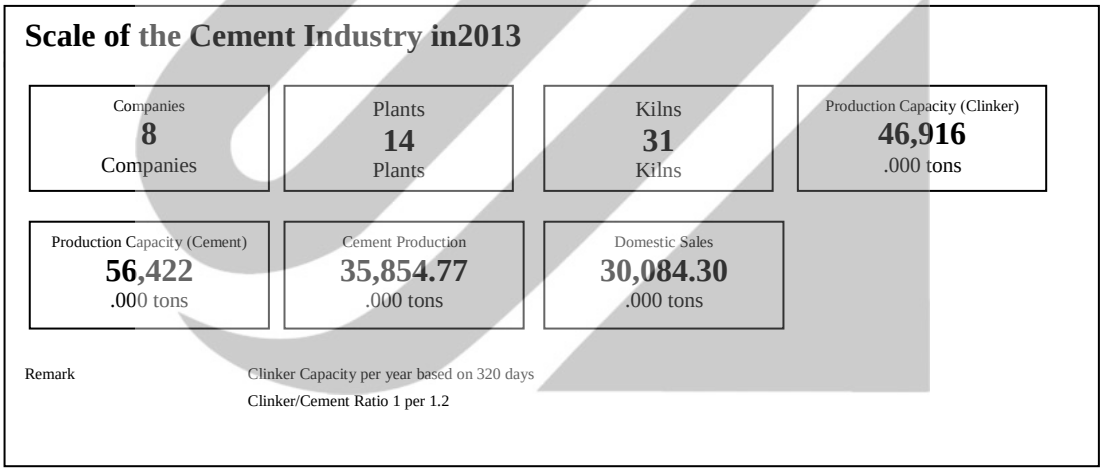


Figure 1.1 Scale of Cement Industry 2013 reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

It is useful to compare the cement per capita consumption in Thailand over the last six years which shows the trend of growth which means if the number of capital has grown then the number of cement consumption has also grown as well as the number of supply and demand as noted in the chart below:

Cement Per Capita Consumption

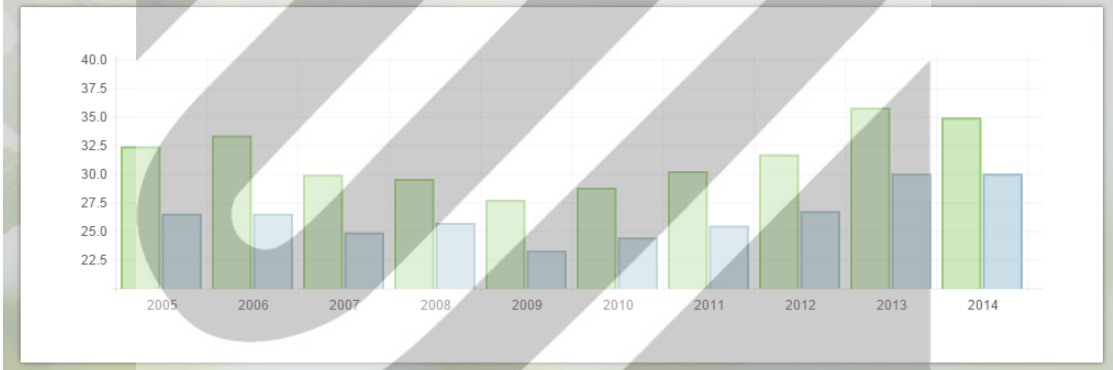
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Consumption (kg./person)	426	423	395	406	368	387	398	434	464	464

Remark: Population in 2013 = 64.79 million
Source: Bank of Thailand
2013 data is forecasted

Figure 1.2 Cement per capita consumption reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers,2015: Online

Supply & Demand



Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Production	32.46	33.42	29.98	29.61	27.78	28.84	30.29	31.76	35.85	34.98
Domestic Demand	26.57	26.57	24.92	25.79	23.33	24.50	25.52	26.80	30.08	30.08

unit : million tons

Domestic Demand Growth

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Growth	4.40	0.00	-6.21	3.37	-9.40	5.00	4.16	5.01	7.50	0.00

Remark: 2014 data is forecasted

Figure 1.3 Cement supply & Demand 2005-2014 reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

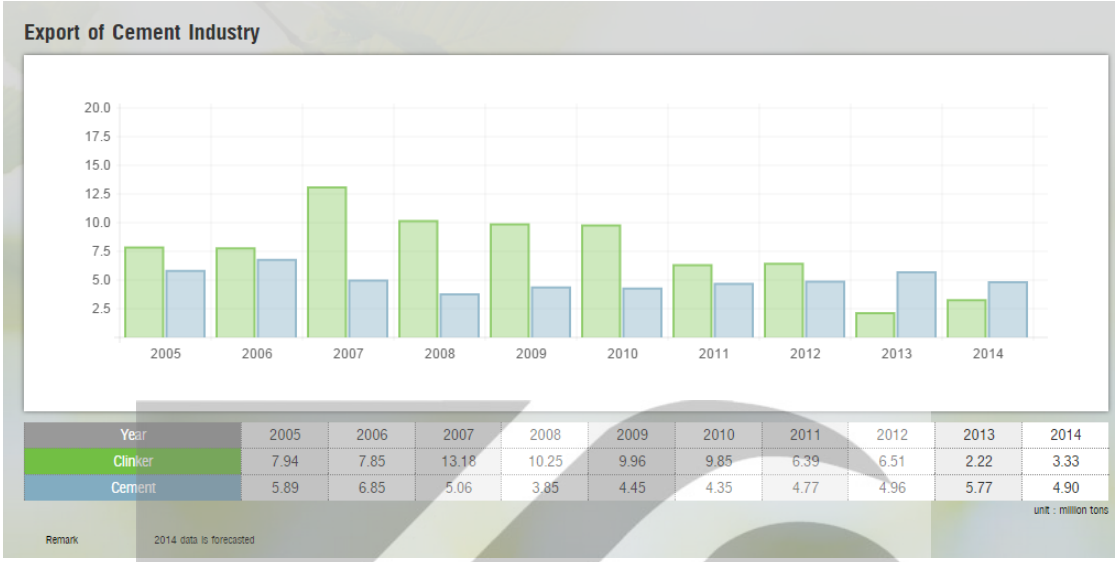


Figure 1.4 Export of Cement Industry reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

According to the survey of all cement factories, the summery of cement factories includes mortar plants where the product is mortar cement.

The Siam Cement Public Co., Ltd.

The Siam Cement Public Co., Ltd. is the biggest cement company in Thailand which owns four cement factories and four mortar cement factories. This is a list of the overall Truck scale used in the factories:

–The Siam Cement (Ta Luang) Co.,Ltd.

Ta Luang plant has 10 units of Truck scale

Khao Wong plant has 16 units of Truck scale

–The Siam Cement (KaengKhoi)Co.,Ltd.

30 units of truck scale

–The Siam Cement (Thung Song) Co.,Ltd.

17 units of Truck scale

– The Siam Cement (Lampand) Co.,Ltd.

8 units of Truck scale

– Siam Mortar Co., Ltd. (Kangkoi)

5 units of Truck scale

– Siam Mortar Co., Ltd. (Chonburi)

4 units of Truck scale

– Siam Mortar Co.,Ltd. (Khao Wong)

5 units of Truck scale

– Siam Mortar Co.,Ltd. (Thung Song) Co. Ltd.

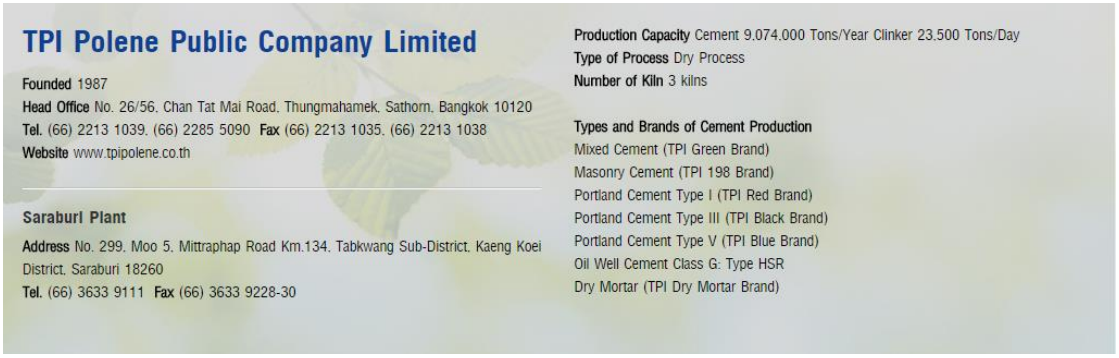
4 units of Truck scale

Figure 1.5 SCG Cement – Building Materials Co.,Ltd. reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

–TPI Polene Public Co., Ltd.

51 units of Truck scale



TPI Polene Public Company Limited

Founded 1987
Head Office No. 26/56. Chan Tat Mai Road. Thungmahamek. Sathorn. Bangkok 10120
Tel. (66) 2213 1039. (66) 2285 5090 **Fax** (66) 2213 1035. (66) 2213 1038
Website www.tpipolene.co.th

Saraburi Plant

Address No. 299. Moo 5. Mittraphap Road Km.134. Tabkwang Sub-District. Kaeng Koei District. Saraburi 18260
Tel. (66) 3633 9111 **Fax** (66) 3633 9228-30

Production Capacity Cement 9.074.000 Tons/Year Clinker 23.500 Tons/Day
Type of Process Dry Process
Number of Kiln 3 kilns

Types and Brands of Cement Production
Mixed Cement (TPI Green Brand)
Masonry Cement (TPI 198 Brand)
Portland Cement Type I (TPI Red Brand)
Portland Cement Type III (TPI Black Brand)
Portland Cement Type V (TPI Blue Brand)
Oil Well Cement Class G: Type HSR
Dry Mortar (TPI Dry Mortar Brand)

Figure 1.6 TPI Polene Public Company Limited, reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

Jalaprathan Cement Public Company.

– Takll plant

4 units of Truck scale

– Cha-am plant

4 units of Truck scale

Jalaprathan Cement Public Company Limited

Founded 1956
Head Office No. 23/124–128. Soi Soonvijai. Rama 9 Road. Bangkapi. Huay Kwang. Bangkok 10310
Tel. (66) 2641 5600 **Fax** (66) 2213 1035. (66) 2641 5688
Website www.asiacement.co.th

1. Takll Plant

Address No. 1. Jalaprathan Cement Road. Takll District. Nakhonsawan 60140
Tel. (66) 5626 1725. (66) 5626 1260. (66) 5626 4467 **Fax** (66) 5626 1780

Production Capacity Cement1.152.000 Tons/Year Clinker 3.000 Tons/Day
Type of Process Dry Process
Number of Kiln 2 kilns

2. Cha-am Plant

Address No. 1. Jalaprathan Cement Road. Cha-Am District. Petchaburi 76120
Tel. (66) 3247 1415-6. (66) 3243 0815-8. (66) 3247 1526 **Fax** (66) 3247 1523

Production Capacity Cement1.190.400 Tons/Year Clinker 3.100 Tons/Day
Type of Process Dry Process
Number of Kiln 1 kiln

Types and Brands of Cement Production
Mixed Cement (Lotus Cobra Brand)
Portland Cement Type I (Lotus Naga Brand)
Portland Cement Type V (Shark Brand)
Oil Well Cement
Portland Cement Type III (Red Naga Brand)
Mixed Cement 40 kg. (Lotus Super Cobra Brand)

Figure 1.7 Jalaprathan Cement Public Company Limited, reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

Cemex (Thailand) Co., Ltd.

– 4 units of Truck scale

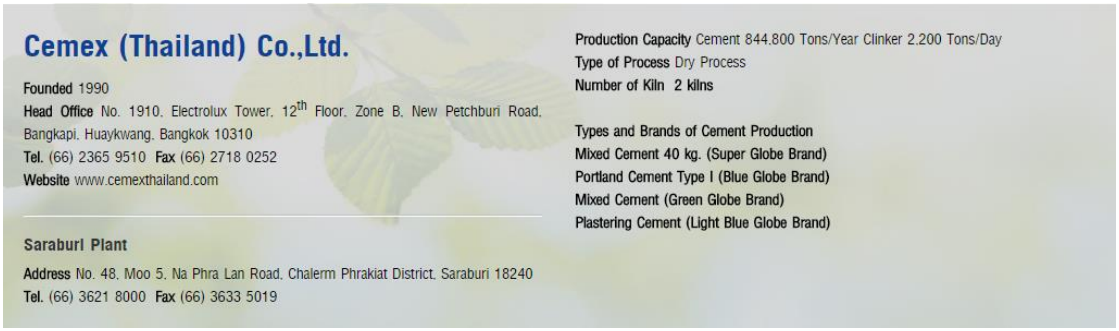


Figure 1.8 Cemex (Thailand) Co., Ltd, reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

Siam City Cement Public Co., Ltd.

– 27 units of Truck scale

Siam City Cement mortar plant

– 5 units of Truck scale

Figure 1.9 Siam City Cement Public Company Limited, reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

Asia Cement Public Co., Ltd.

– 15 units of Truck scale

Figure 1.10 Asia Cement Public Company Limited, reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

Thai Pride Cement Co., Ltd.

– 5 units of Truck scale

Figure 1.11 Thai Pride Cement Co., Ltd. reference to Thailand Fellowship of Cement Manufacturers

Source: Thailand Fellowship of Cement Manufacturers, 2015: Online

One of the main basic problems is that almost all of the employees who are involved with using the Truck scale in a cement factory generally do not completely understand about how much the cost effect will be in the case of any Truck scale downtime. If only for just a few days it still means that they could not deliver any goods to the customers and, because of this delay, their customers may well change to another cement factory or their competitor due to marketing competition and a lost opportunity to make business with customers because they also could not receive the raw material for the product of cement.

The reason to study this problem is to discover what the main factors are that directly or indirectly affect the decision to purchase Truck scale size 3x18 meters for a

cement factory for Truck scale suppliers. This is the chance for cement companies to study how to develop Truck scale product to serve specific needs of cement factories and for the cement factory to know what factors they must take seriously if they want to make new Truck scale.

1.2 Objectives

1)To study factors that influence the buying decision making of a Truck scale size 3x18 meters by a cement factory.

2)To study the criteria of each purchasing factor of a Truck scale size 3x18 meters by a cement factory.

3)To study customer behavior of purchasing Truck scale size 3x18 meters by a cement factory.

1.3 Significance of the Study

This research project aimed to investigate the factors that influence the buying decision making of a Truck scale size 3x18 meters by a cement factory in Thailand. This research explored the relationship between the variables that influence purchasing decisions by a cement factory. The finding of this research may also help cement factories and Truck scale suppliers in Thailand to know how to improve the product to suit with a cement factory and for the cement factories to know what factors they have to emphasis on the Truck scale when they have a plan to buy a new one or upgrade and improve the existing Truck scale.

The Truck scale industry has played a significant role as being useful instrument equipment in the cement factories according to the process of production of cement in having to weigh cement for commercial reason, checking the loss of cement packing, checking the yield of production and checking that the weight of each Truck is not over the limit of the highway regulations before it leaves the cement factory.

In the case of when the Truck scale is not in a state of good performance, it will create a huge problem for the cement factory in terms of inaccuracy or even stop the production line because it would not be able to deliver the goods or receive raw material or calculate the yield of production. The comparison of the input and output

volume is shown below as an example of the errors that may occur if the Truck scale error occurs at only 40 kg per each Truck:

– In a hypothetical example, a customer weighs 100 Trucks per day of cement

– Gross Truck weights are around 50,000 kg and net loads are 32,000 kg

– Their scale is weighing 40kg light on every Truckload they sell

– Cement costs around 3 THB/kg. according to the prices listed in www.scgexperience.co.th

– A cement factory loss of money based on 100 (Trucks weighed per day) x 40kg(errors in weight) x 320(days) x 3 (THB/kg).

– Total loss of revenue equals 3,840,000 THB/Truck scale as one unit

1.4 Scope and the limitation of the study

Scope of study

1) The target population was several cement factories in Thailand which owned and actively used a Truck scale.

2) Distributing questionnaires in Thailand among people who were involved with Truck scale in their job, to collect relevant research data.

3) The survey covered the population of several cement factories in Thailand using a total of340 people from 18 factories.

The limitation of the study

1) The research was limited to the cement factories in Thailand, which could not be carried out in another country.

2) The research focused on the cement factory, so the results from the survey only reflected on the particular cement factory so could not be generalized to include other business fields.

3) The research was conducted during a specific time-period, thus it cannot be generalized to include all the time throughout all the year.

4) There could be a lack in the details in some parts of this research, due to the time constraint during the research.

5) There was likely to be a low response rate from the target population, which

may adversely affect the representation of the sample and could generate some unreliability in the results.

1.5 Conceptual Framework

As reconsidering the related theories, framework, other related research and interview expertise, the Conceptual Framework was constructed and tested on the factors that either directly or indirectly influences the buying decision towards a Truck scale for cement factories in Thailand.

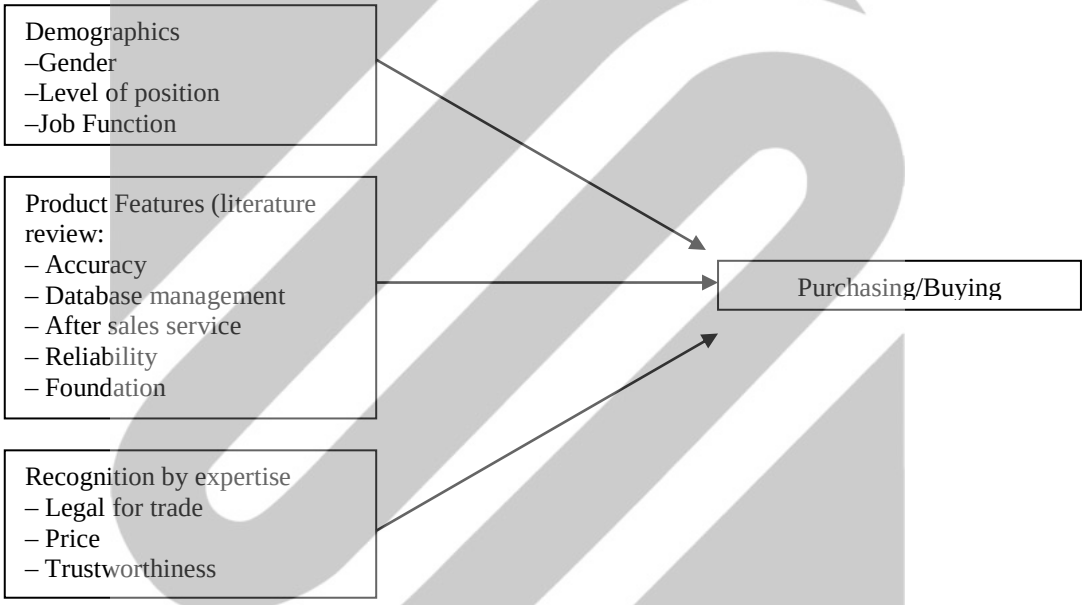


Figure 1.12 Conceptual Framework

1.6 Research Hypotheses

H1 Demographics affecting the decision to purchasing a Truck scale

H2 Truck scale accuracy affecting the decision to purchasing a Truck scale

H3 Database management affecting the decision to purchasing a Truck scale

H4 After-sales service affecting the decision to purchasing a Truck scale

H5 Truck scale reliability affecting the decision to purchasing a Truck scale

H6 Truck scale foundation affecting the decision to purchasing a Truck scale

H7 Truck scale legal for trade affecting the decision to purchasing a Truck scale

H8 Price of the Truck scale affecting the decision to purchasing a Truck scale

H9 Trustworthiness of the Truck scale Supplier Company affecting the

decision to purchasing a Truck scale

1.7 Definition of Terms

Truck scale: This is the scale or platform which is used for measuring the weight of a Truck or vehicle. Most cement factories use it for weighing Trucks which contain raw material or finished goods in both inbound and outbound of the factory. However, it is also used for most other factories which receive or deliver goods by Truck.

Cement or Portland cement (Dimitrios Antos. (2011). *Human Factors in Computer Decision-Making*, PhD thesis, Cambridge: Harvard University). Cement is the building material of fine gray powder made of a mixture of clay limestone to be make concrete when it is mixed with water, sand, stone or aggregate. The Portland cement is used for construction and other areas with similar purposes.

The decision-making algorithm lies entirely within the agent. It aims to determine a course of action for the agent based on its preference, goals and observations. The second type of agent is required to interact (Negotiate, Collaborate with, or Assist) humans in carrying out their task. In doing so, the agent may also reason about the way humans make their decision, indicate their preferences and the way they react both emotionally and cognitively (Makenzie Dockery, 2013: Online)

Price: This is set by a company for products or services, depending on the feature and benefit to each customer and the target market's budget. The correct price makes it attractive to customers or the business and is worth as much as people are willing to pay for it. The product owner or company has to consider the competitor's pricing strategy and marketing development. The price is always an important attribute in the decision making process (Herrmann, A., Xia, L., Monroe, K. B. and Huber, F, 2007), The price is determined by the customer perceived value of the product so they will agree to pay for that product, so these factors will indicate the product price.

CHAPTER 2

LITERATURES REVIEW

2.1Truck Scale and main components of a Truck scale

According to Mettler-Toledo International Inc. (2015) the Truck scales all over the world is the part of equipment used to weigh Trucks or other vehicle businesses both large or small. It is also used by logistic businesses and vehicles carrying everything from the very big steel pipes to agricultural products and even waste. The factories use a Truck scale to weigh vehicles which carry raw material to buy from a supplier or selling goods to customers. Therefore, the Truck scale is the same as cash registration for a factory to let the owner know how much they have to charge their customers or how much they have to pay for buying raw material from suppliers. However, every country has regulations to limit the weight of each vehicle to avoid the vehicles to damage the highway roads. If a vehicle is carrying over the regulated weight allowance it may cause the vehicle's engine to fail or the tires might blow out end route. The main components of a Truck scale are describes as follows.

Foundation

According to Motor Truck Scales (2015), this is the main point of a Truck scale because it is the main component to absorb the force of weight from a vehicle. This means that the foundation must be the strongest part of a Truck scale and most of foundation stands above the pilling concrete. The design of the foundation has two main types: First is the above ground or pit less type and second is the pit type or semi-pit type as can be seen in the following pictures:

Figure 2.1 Foundation Pitless type

Source: Mettler-Toledo International Inc., 2012: Online

Figure 2.2 Foundation Semi-pit type

Source: Mettler-Toledo International Inc., 2013: Online

Weighbridge (Platform)

The scale deck is where the vehicle parks on when weighing the structure which creates the driving surface for the vehicle. It can be designed to be totally made of steel, with a steel plate or having the steel structure and filled with concrete to have a concrete surface. It depends on the application because, if it is a temporary Truck scale, it should be the steel type due to the cost of moving the platform.

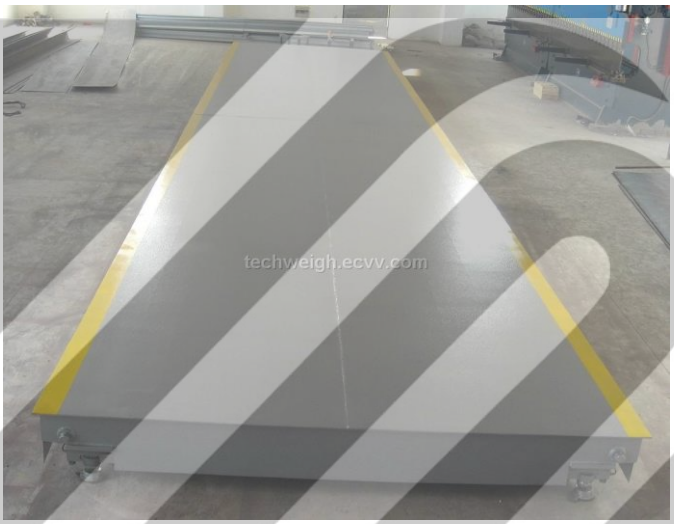


Figure 2.3 Platform Steel type

Source: Tech-Weigh Electronics Co., Ltd., 2014: Online

Figure 2.4 Platform concrete type

Source: Mettler-Toledo International Inc., 2012: Online

Load cell

According to Thomas publishing company (2015), the censors which measure the weight are installed under the platform. The platform is supported by the load cell themselves and there are very few differences of load cell types typically positioned at the corners of each platform module.

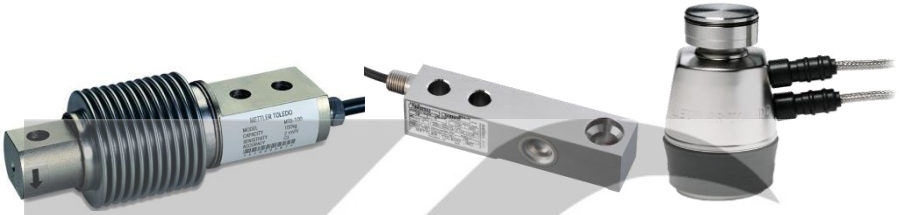


Figure 2.5 Load cell of a Truck scale

Source: Mettler-Toledo International Inc., 2012: Online

Terminal or Indicator

The control panel of the scale shows the weight value to the operator or it is used to serve the connection point to other devices, such as a computer, remote display or other scale peripherals.

Junction boxes

These are used to combine the signal from all load cells via load cell cables to the terminal by using home run cable and this is the equipment to adjust the section balance error of a Truck scale.

Information management

The scale software management is installed in the computer and controls all the data and information of each Truck in both the inbound and outbound. Most of the information management can summarize the data and do the report history and control the product inventory of raw material. However, as the technology of information technology it growing so fast, then this part can help a cement factory to analyze the history and forecast the future orders. It can even be used for the CRM (Customer Relationship Management) system according to Tom Siebel (1993).

2.2 Literature Reviewed

Several factors are important in affecting the decision to purchasing a Truck scale size 3x18 meters for a cement factory. All of the factors are based on the literature review of relevant journals and articles, so the following are the common factors involved.

2.2.1 Accuracy of a Truck scale

All of the cement factories use a truck scale to weigh the net weight of goods to charge the correct fees to customers and to then recheck the weight when they buy raw material. Therefore, the accuracy of the machine will be the first factor to make the decision to buy a Truck scale. According to Hudson, Mettler-Toledo(2013),the accuracy is the most important part of a Truck scale because a factory buys and sells goods by using the weight from a Truck scale recording. In that case, even the smallest error of each Truck will cause a huge money loss to the factory when considering if every Truck weighed an error of +30kg every time. If the factory weighed 100 trucks a day, this would mean they give away 30kg to every Truck and 3,000kg every day, so the accuracy of the Truck scale involves a lot of factors according to Tech-Weigh Electronics Co., Ltd. (2015). Any problem with a Truck scale systematic because once the scale accuracy is compromised it affects every load afterwards. The new technology can help and improve the ability to avoid this kind of error. One way to avoid inaccuracy is the recalibration routine because the Truck scale has the tendency to lack complete accuracy from time to time.

2.2.2 Database management

The database management is important for the Truck scale as it is used to manage all the data of a Truck, such as the company name, driver’s name, the license plate ID, material carried, weight value (Gross weight, Net weight, Tare weight,) and all the data will be kept on a computer database, as noted by Kotler database management of a Truck scale is the part of a business and it can be divided into three levels of data handling: Basic, Intermediate and High-end data. Handling the basic data provides gross, tare, net and simple accumulations with data printed out for intermediate data handling which usually involves a customer or proprietary

electronics, such as control of the filling out of an application and data manipulation accumulations by each product. The last section is about High-end data and would have more function control, accounting functions, and all data sent output to manufacturing control systems. According to Hudson, Mettler Toledo (2013), nowadays Truck scale database management do not only store the data for inbound and outbound weight storage as in the past, because information technology is growing and has developed so fast that it makes factories use Truck scale database management to process business transactions, adjust material inventory, measure productivity, ensure proper loading and safety, and check compliance with the vehicle weight regulations. According to Markenzie Dockery (2013), if all relevant information was gathered via pen and paper, it is potentially more likely to cause an error and is very time consuming which effects the productivity of the factory. To eliminate this problem, the Truck scale database management becomes important for the Truck scale system.

2.2.3 After-sales service

According to Sallaudin Hassan in his article:'Factors Affecting Industrial Goods Buying Decision Making in a Manufacturing Company' in the Journal of Marketing and Management, (2010), service is one of the most important factors of industrial goods buying decisions. The price of a product is only one factor, according to Kelley Stoklosa (2012). The calibration and recalibration of the Truck scale is the key to make sure that the Truck scale is ready to be used in terms of weight with good accuracy or the preventive maintenance which adjusts some moving parts such as the bumper bolts or check rods. This has to be considered for buying because all these tasks have to be done by service professionals. The frequent recalibration and adjustments depends on the results of the last check, the volume of use, the value of the commodity being weighed and the commercial requirements where the scale is installed. According to Mettler-Toledo AG Industrial (2013) *Truck Scale Buying Guide*, the service part involves three main concepts: Maintenance, Service and Warranties. All of them take a role in the service factor as the proactive maintenance will ensure long scale life and the schedule of calibration only makes sure that the

scale is in error within the legal tolerance as it does not make sure that the scale consistently presents perfect accuracy.

2.2.4 Reliability

According to Avery Weigh-Tronix(2013), the reliability of a Truck scale is contained in two topics. First is keeping downtime to a minimum. This part can be done by using the right electronic product and foundation type because if the scale is under the ground, it has to make sure that the equipment can stand for water or dust. Second is about a strong, durable vehicle scale which has to make sure that the scale is heavy enough to be used in heavy duty trucks and other vehicles. The main part has to consider whether the platform has a steel desk as the driving surface because it is the part that the Truck driver will park the truck onto the scale. According to Hudson, Mettler-Toledo (2013), reliability is the part which has to be the significant factor especially for cement producers, because it can create a problem if the scale downtime results in production delays and some loss of business, as well as the loss of money which has to be paid to repair the scale. The cause of the problem can come from several different ways, as the load cell could become damaged from the local environment, or shock load etc. The cable can be a point of weakness if they are not properly protected and the material of the cable could not stand the environment. The main cause of the main Truck scale system damage is lightning strikes, which are time consuming to investigate the problem to repair. According to Sallaudin Hassan(2010), the product reliability is also one factor and the result of this journal article shows that product reliability ranks in third place, following price and product safety.

2.2.5 Foundation

According to Makenzie Dockery (2013), the foundation has two types which are above-ground and pit-style. Both have pros and cons. The above-ground type requires ramps and the approaches which consume a large area but it is easy for maintenance and service regarding to clear and clean all the debris is much easier as it is very accessible. According to Mettler-Toledo AG Industrial (2013), the *Truck Scale Buying Guide* shows that the foundation is a very significant part. A factory builds a Truck scale foundation to absorb the force of weight from the Truck scale so it has to

be the strongest part in case of some collapse or unbalance of the foundation to occur. It will be the cause of inaccuracy of the Truck scale and the type of the foundation. This depends on the site or the factory conditions concerning how to access the equipment parts for maintenance, the factory water drainage system, and the company safety policies.

2.3 Business to business buying behavior

Level of position and Job Function

According to Kotler and Armstrong the decision-making unit is called a buying center and it consists of every person involved in the decision making and buying processes. These people are from different job functions and different levels of position. They include actual users of the product or service, the decision makers, those with influence, and the gatekeepers. They all have their own motivations and preferences influenced by a lot of factors including their gender, job position, education background, work experience, personal and cultural background, as all of these have an influence in one's buying behavior. Therefore each person has their own goal. The individual goals are driven by their own specific needs while attempting to maximize the KPI (Key Performance Indicator) which is set by the company. On the other hand, a product that is bought to serve a personal need is also bought to solve a company's problem as well. This is why business to business buying decisions are both rational and emotional, serving the needs of the individual as well as the company (Kotler et al., 2009).

Hutt and Speh (2012) in their work *Business Marketing Management*, suggested that organization buying is based on the quality of the product, reliability and company trustworthiness. Normally, if the products are a commodity then the price becomes the first most important selection criteria in the purchasing decision. However, if the product is customized for each application or purpose, then it will not only be the price but other criteria will also be considered and the supplier will have the possibility to develop a strategy relationship with each customer (Hutt and Speh, 2010).

The suitable price for a product or a service does not have to be the lowest price, but the best quality will be the first ratio, as noted by Brassington and Pettitt in

Principles of Marketing (2006). The buyers take a serious look at the quality consistency and the supplier-customer after-sales service when they compare these factors between potential suppliers. The supplier reliability and consistency plays an important role in each business buyer's decision making process. A company needs to make sure that their supplier will be around in the future in case any problems with the product will occur (Brassington and Pettitt, 2006: 175f).

Friendships and social needs also affect business buying behavior. Trustworthiness is built on a personal level between the Sales representative and the customer. Also, the buyer should be valued, as Brassington and Pettitt pointed out. Trustworthiness can build on an organization level, but the study showed that the personal contact is very important because of the organization trust (Brassington and Pettitt, 2006: 175f).

2.4 Concept of recognition by experts

The researcher for this project interviewed three experts who had experience and had worked in the field of the Truck scale business. One of the respondents interviewed in this research project was Mr.Angkarn Puangnak, the Head of the Central Bureau of Weights and Measures, at the Ministry of Commerce in Thailand. He said the most important factors of truck scale for a cement factory are three things: Legal for trade, Accuracy, and Reliability. The first, Legal for trade, is important because if a factory uses a Truck scale which is not within the legal regulations, it could damage the company's creditability with their customers, regarding the Truck scale has to comply with the regulations if it is used for commercial reasons. Second is accuracy which is important because this will turn to profit of the factory if they can make the Truck scale as accurate as possible. The price of cement is increasing, not like it was in the past, when cement price was two or three times lower than it is now. If a factory can secure every Truck they weigh then this will save a huge amount of money and this will turn into revenue for the factory. The third factor he mentioned was reliability, because the local environment of a cement factory is not the same as any other factory in terms of dust from the cement. If the factory uses a product which is not an industrial type it could cause problems for them after they use it over a few years. The downtime of the Truck scale will also create a lot of problems.

Another interview was with Mr. Nattapol Sriaksorn, the Sales manager of the Industry Department. He responds on how the Truck scale business can be influenced both directly and indirectly at Mettler-Toledo (Thailand) Ltd. As an example. He said that the trustworthiness of a Truck scale supplier is the most important part as, in his own experience, the Truck scale can last a long active life time. Some Truck scales can be used for more than 15 years, so that is why cement factories want a supplier with a good image and hold a stable long term partnership. Regarding the Truck scale regulations in Thailand it requires factories to calibrate and obtain a stamping from the Central Bureau of Weights and Measures officer at least once to last for two years. If a factory follows any standard like the ISO or other standards, it might require a more regular calibration of the instruments and equipment. This means that the Truck scale is one area that a cement factory has to use an after-sales service, because the checks will have to be done by a third party with the Central Bureau of Weights and Measures officer. Therefore, this does not include preventive maintenance which every cement factory is requested to have done by the Truck scale supplier.

A third interview was with Mr.Kritchon Metheenopanant, the owner and Managing Director of CJCC Intertrade Co., Ltd. He is also the advisor of the Thai Weights and Measures Association and has had direct experience with the Truck scale business for over21 years. As a supplier of the Truck scale for cement factories, he stated that there are a lot of factors that are important to make the decision to purchase a Truck scale for a cement factory. However, the most significant covers three main issues. The first is about the performance of the Truck scale in terms of the product feature and product lift time. The second is the after-sales service and consultative selling because if a customer wants to build a new Truck scale they will want to know about the very basic knowledge of the Truck scale product in order to make sure that the Truck scale will be suitable for each application and after-sales service. The Truck scale takes a significant role for a cement factory in case of any error that occurs because to not use the Truck scale will have a huge negative effect. The factory would not be able to receive raw material or deliver any goods to customers. The last factor is the price, because a Truck scale product has a price range from about 400,000 to 2,000,000 THB. If a customer does not have the basic knowledge of a Truck scale and uses a Truck scale of a low price they might find that it is not suitable with the

factory's application. It also may not be usable because of the local environment of the cement factory. It will become damaged in the short term and have a negative effect on the product in a longer length of time.

2.5 Decision Making Process

Regarding previous marketing research, the decision making process is the commonly used theory which can be applied in many kinds of product. This also true with Truck scale purchasing, according to *Consumer Behavior* (Michael R.Solomon, 2003:199). This model includes five stages: Problem recognition; Information search; Evaluation of alternatives; Purchase decisions; and Final outcomes. The table below provides an overview of the decision-making process:

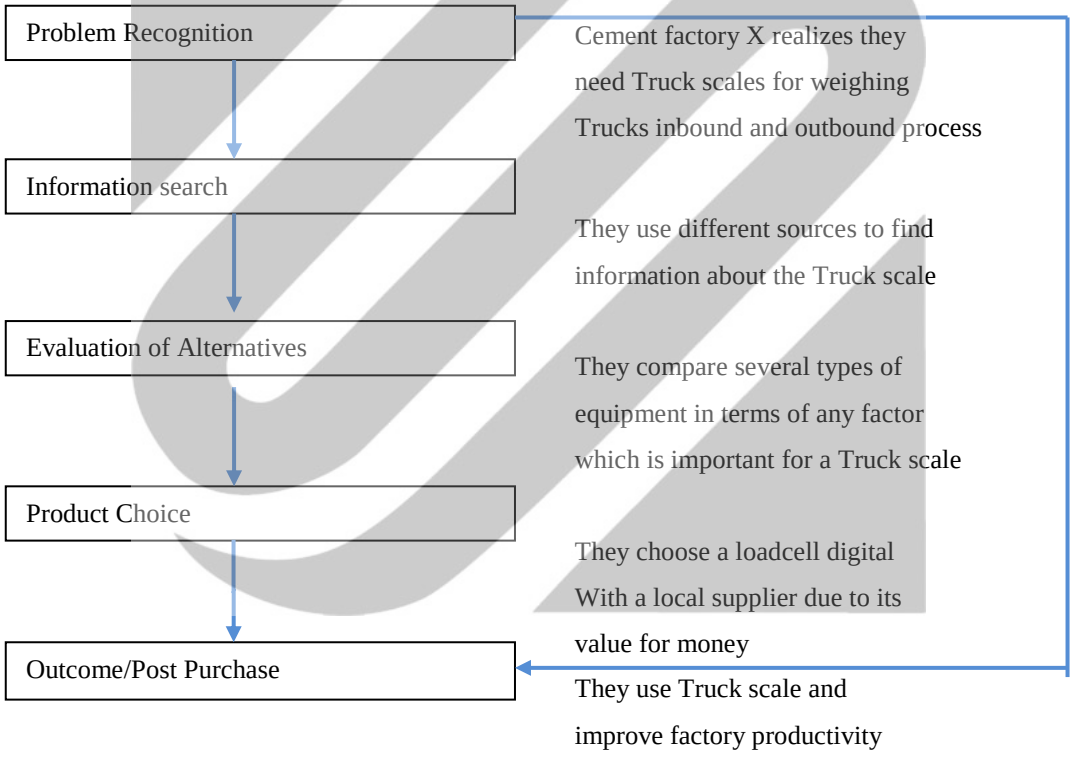


Figure 2.6 Stages in consumer decision making

2.6 Previous Studies and Related Research

Sam Dzever, Pascale G. Quester and Sylvie Chetty (2001) studied about the factors that affect the industrial procurement decision in the Asia-Pacific region. The research showed that it is not only the purchasing department who design the whole

process of buying industrial goods, as it also has to involve other departments including engineering, users or the production team. Sallaudin Hassan (2010), studied about the factors that affect industrial goods buying decisions and also analyzed the factors that affect the product purchased and the supplier selection, the marketing strategies of suppliers and the influence involved in product buying decision–making. Hassan also studied the satisfaction levels of the manufacturing factory on their current product and supplier. The analysis was based on buying a new product and the repurchasing situation. The research found the most significant item to buy new equipment and re-buy it concerned the product performance. The whole product test run availability was the most significant item.

Market Line Industry Profile (2014) studied about cement production in the Asia-Pacific region. The summery of this research project was that the cement factory is generally dominated by domestic production and the industry has a high entry barrier as the economics of scale is so important. However, the Asia-Pacific cement market, including Thailand, grew by 8% in 2013. The market value forecast for 2018, suggests that the Asia-Pacific cement market to have the value of $USD 304,987.6 million which will be an increase of 56.7% since 2013. The market volume grew by 9.4% in 2013 to reach a volume of 2,925.5 million tons. The market volume forecast in 2018 suggests a market value forecast of 4,476.5 million tons, an increase of 53% since 2013. The geography segmentation in China accounts for 73.2% of the market value as the size of the physical geography and the number of the population in Chinaare both the highest in the Asia-Pacific region. The market rivalry in the cement market is dominated by domestic production, except in Singapore, where all the cement supplies are imported from another country for the entire market.

Webster (1991), argued that industrial goods and services can be determined in several ways. A typical sub-division is heavy or light equipment, components and subassemblies, process of materials, maintenance, repair and operating supply and service. The definition of an industrial customer consists of manufacturing and processing factories including food, chemicals and petroleum factories, so every factory has its purchasing objectives. The objectives are common to make sure they are buying the right items in the right quantity at the right place for delivery at the right time and place. The important factors include the identification of the major

product specification, the amount of purchase price and delivery and ensuring that the purchased product and service are available when and where needed. The product quality is the other objective of the purchasing process. The reasonable price is another objective after the product quality. The objective of the purchasing unit is to develop and receive the necessary services with other objectives, such as the technical support, application assistance, repair and maintenance (after-sales service). The last important objective is to develop favorable long term relationships and new sources of supply in order to guarantee the continued availability of goods and services from the same suppliers.

Jie-Shin Lin (2010), researched "The determinant factors of China's Truck production" and the results showed that the Truck manufacturing and business has grown and expanded since the announcement by the Chinese Government concerning the Automotive Industry Development Policy in 1994. This has made this business to grow very fast and gain substantial global significance. In 2003, the Chinese automobile industry ranked as number four in the world by producing a total of 4.5 million Trucks with an annual growth rate of 34% including more than one million Trucks in 2002. Other research projects focused on Truck production under the influence of both a Market Economy and Planning Economy. The results indicate the existence of a significant positive correlation between vehicle production in China and both its current GNP growth rate in the time trend. Moreover, the research results also revealed a significant negative correlation between vehicle production in China and the two variables which are the current average automobile price and the current number of automobile manufacturers. Therefore, information from this research on China is related to this specific study because the trucks which are used in cement factories in Thailand are also imported from China. The increase of the number of trucks directly relates to the increase of the Truck scales used as well.

CHAPTER 3
RESEARCH METHODOLOGY

For the study of what factors influence the buying decision making of Truck scales size 3x18 meters by cement factories in Thailand, the researcher developed and designed the research methodology according to the material studied. Therefore, the methodology included the scope of the study; a selected population and sample size; the research planning process; several relevant hypotheses of the study; a research design and instrument; the data collecting procedure; and the final data analysis.

3.1 Population and Sample Size

The population of this study included employees from several cement factories in Thailand who were involved in the different stages of the decision to buying a new Truck scale. Within the sample, there were at least two people from purchaser office, 8 people from the production department or users, 5 people from the maintenance team, 2 people as project engineers, one person as a civil engineer, one person as an instrument engineer, one person as a safety engineer and all worked at17 cement factories in Thailand, based on data from the Thailand Fellowship of Cement Manufacturers or TFCM (2014).

The size of the sample group in this study was calculated by using the equation established by Taro Yamane (Yamane, 1973). The equation is as follows:

$$n = N / 1+N(e)^2$$

Remark; n = sample size

N = 340

e = significant level (0.05)

From the equation, the sample size can be calculated as follows:

$$n = 340 / 1 + 340(0.05)^2$$

$$= 183.783$$

Therefore, this study collected data from 184 samples from employees who worked at a cement factory in Thailand and were involved in the Truck scale product. Data collection was conducted by using the non-probability sampling technique in the type of convenience sampling at a cement factory where the sample group worked. Data was also collected in a public seminar for a cement factory, where the main researcher of this project presented a speech covering the topic: "How to increase and improve productivity of Truck scales by following the Thai regulations of legal for trade." The seminar was held at Mettler-Toledo (Thailand) Co.,Ltd. Head Office in Bangkok. Further data was collect by using Google Drive when the researcher sent a link of the questionnaire to employees of cement factories and asked them to complete it online.

3.2 Research Methodology

Quantitative research methodology was applied during this study with the population of cement factory employees who were involved with Truck scale. This research was conducted to discover and assess the factors that either directly or indirectly influence the purchasing decision towards a Truck scale for cement factories. In order to find the factors involved, several sources of information were used, including academic articles, journals, other research studies, and interviews with three experts who have worked for many years within the Truck scale industry in Thailand.

3.3 Data Collection

The researcher used a structured survey questionnaire and also undertook three face-to-face interviews with experts working in the field. The specific procedures for collecting the data were as follows:

1) Collecting information from various sources, including books, journals, government publications, government or international organizations annual reports, and websites on the internet.

2) Conducting questionnaires in sever all cement factories in Thailand with respondents who were employees who were personally involved with the Truck scale.

The ways to allow the respondent's to complete the questionnaire was as follows:

2.1) A hard copy was handed out while asking the respondents to fill in their answers in the questionnaire.

2.2) An email with the questionnaire attached was sent to some respondents with the request that they could print it out and fill in their answers.

2.3) A questionnaire was created on Google Drive and the link was sent to other respondents with the request that they fill in their answers online.

2.4) As the researcher is a speaker on topics covering Truck scale, a seminar was arranged concerning Truck scale technology for cement factories. At the end of the seminar, the researcher asked the attendees to fill in their answers into the questionnaire.

3) The data was analyzed and used to test the nine set hypotheses.

4) A conclusion was reached and some recommendations were suggested for any potential further studies in this area of research.

3.4 Quantitative Data Analysis

After all the data had been collected, editing the data was the first process to collect and make sure that all the data was complete, to make sure that only the data that was complete would be used. The researcher analyzed the data variables using the Data Analysis Program software to compute for the results. The outputs of the project have been presented in Chapter Four (Research Findings) and the results of all the respondents will be presented as follows:

1) Descriptive statistics to describe the demographic variables, such as age, gender, education level, religion, income, occupation, and marital status by mean, frequency distribution and percentage.

2) Descriptive statistics inducting mean, frequency, percentage and standard deviation were employed to test the answers to the research questions and the nine hypotheses as follows:

H1 Demographics affecting the decision to purchasing a Truck scale

H2 Truck scale accuracy affecting the decision to purchasing a Truck scale

H3 Database management affecting the decision to purchasing a Truck scale

H4 After-sales service affecting the decision to purchasing a Truck scale

H5 Truck scale reliability affecting the decision to purchasing a Truck scale

H6 Truck scale foundation affecting the decision to purchasing a Truck scale

H7 Truck scale legal for trade affecting the decision to purchasing a Truck scale

H8 Price of the Truck scale affecting the decision to purchasing a Truck scale

H9 Trustworthiness of the Truck scale Supplier Company affecting the decision to purchasing a Truck scale

3.5 Data Collection Procedure

Data collection procedures were as follows:

1) Design the questionnaire following then nine factors of the hypotheses and submit this to the research thesis supervisor for a review, inspection and obtain recommendations.

2) Edit any points referred to for recommendation from the supervisor and resubmit it again to ensure the entire list of questions are correct.

3) Undertake the IOC (Index of Item-Objective Congruence) test by submitting the questionnaire to three professors including the research thesis supervisor to ensure the questions are correct.

4) After passing the IOC test, a pilot testing of the questionnaire was launched to employees in a cement factory who were involved with Truck scale in their factory. A total of 30 respondents were used for reliability analysis. The alpha test was 0.601 for questionnaire in Part.1 and 0.828 for in Part.2, which is greater than 0.6 according to Nunnally (1978). Both figures are near to 1 which means that the questionnaire was reliable.

5) Launching the final questionnaire survey to a population of both males and females in several cement factories in Thailand. The sample population consisted of 184 people. The data collection process was conducted every day during 1 January to 31 January, 2015.

3.5.1Committeeof expert judges

Although this research is written in English language, the researcher decided to write and use the questionnaire in Thai language because most of the population who participated in the study was Thai. However, the questionnaire was also written in

English language. The two committee members of Stamford International University, Bangkok campus, and one expert in the Truck scale business were all invited to form the Defense Committee to collaborate effectively. They analyzed the validation that was considered by the Index of Item Objective Congruence (IOC) and calculate the Internal Consistency (IC), as highlighted by Rovinelli and Hambleton (1997).

For carrying out the questionnaire and sending it out via email was one piece of advice. Another suggestion was to use the Thai version in the circumstances of using Thai employees as the target population. Another suggestion concerned the sections of the questionnaire. The first part considers the demographics, and the second part focuses on the product features and recognition by the experts. The last part focuses on the decision making process. The entire committee members accepted to participate in the research project assessment, to return the material and finish in time for the researcher to write the conclusion.

The calculation followed the formulation as shown in the following:

$$IC = \frac{\Sigma R}{N}$$

IC = Internal Consistency

Σ R = Number of items evaluated by the judges

N =The total number of judges

A commonly accepted rule for describing Internal Consistency (IC) is as follows:

Value	IC
0.9-1.00	Excellent
0.7-0.89	Good
0.50-0.69	Fair
0.00-0.49	Poor

CHAPTER 4
RESEARCH FINDINGS

This chapter presents the findings from descriptive analysis of the respondents of the factors that influence the buying decision making of Truck scale size 3x18 meters by a cement factory. There were 184 completed questionnaires collected in this research study, along with 184 samples as the staff of cement factories who were involved with the Truck scale. All the questionnaires were accepted, and the descriptive statistics were analyzed by Frequency Distribution, percentage, Mean, Standard Deviation and Inferential Statistics. The statistics were also assessed by using T-Test and Correlation so the results of the analysis are in the Tables in the following pages:

4.1 Demographic characteristics

4.1.1 Gender

Table 4.1 Demographic characteristics of correspondents followed by Gender

Gender	Frequency	Percent
Female	35	19.0
Male	149	81.0
Total	184	100.0

Table 4.1 illustrates the gender of the total respondents as follows: there were149 males (81%) and 35 females (19%) from a total response of 184 people. That shows that most of the people involved with Truck scale in cement factories are male. In terms of their occupation, most of the male respondents were technicians and engineers in the Instruments, Civil, Mechanical, Safety, and Electrical fields who participated in the survey and most of the female respondents were from the Purchaser office.

Table 4.2 Demographic characteristics correspondents following by Position

Level of position	Frequency	Percent
Staff	132	71.7
Section Head	24	13.0
Department Head	20	10.9
Management level	7	3.8
Other (Engineer)	1	0.5
Total	184	100.0

Table 4.2 illustrates the level of the employment position of the total number of respondents as follows: there were at Staff level – 132 people (71.7%); at Section Head – 24people (13%); at Department Head – 20 people (10.9%); at Management level – 7 people (3.8%); One other person (0.5%) as is usually found in every company which has more employees at operation level than upper level so, in this case, most of respondents were from lower staff positions.

Table 4.3 Demographic characteristics correspondents following by Job Function

Job	Frequency	Percent
Purchaser	30	16.3
Production or user	33	17.9
Maintenance	56	30.4
Project Engineer	24	13.0
Civil Engineer	12	6.5
Instrument Engineer	16	8.7
Safety Engineer	13	7.1
Total	184	100

Table 4.3 illustrates the Job function of the total number of respondents as follows: there were 30 Purchasers– (16.3%); there were 33 in the Production team or users – (17.9%); there were56 in Maintenance – (30.4%); there were 24 Project engineers – (13%); there were12 Civil engineers – (6.5%); there were16 Instrument engineers – (8.7%); there were13 Safety engineers – (7.1%). As noted in Chapter 3.1 in reference to the population and the sample size it became clear that most people who were involved with a Truck scale in a cement factory worked in the Maintenance section and the production team or users. The number is much less for those who work as civil engineers and safety engineers. For example, one person from engineering responded for both the mechanical section and the project expansion in the factory.

4.2 Product Features and factors which are recognized by experts.

This is the analysis of product features which influence the buying decision maker of a Truck scale size 3x18 for cement factories in Thailand.

Table 4.4 Means ($\bar{x}$) and Standard Deviation (SD) of Truck scale accuracy features which influence the buying decision of Truck scale 3x18 for a cement factory(Truck scale accuracy)

Description	$\bar{x}$	SD	Level
Truck scale accuracy	3.61	0.89	High
- I feel OK if there is a Truck scale error in the Torrance of Weight and Measure acceptance	3.34	1.35	Average
- I know the impact to the factory revenue if there is a Truck scale error ±30 kg every time when weighing a Truck	3.9	0.99	High

Table 4.4 From the survey of product features of Truck scale accuracy factors. The results show that the respondent's opinion agreed with this factor. Therefore, looking in detail at each comment, it became apparent that for:"I feel OK if there is a Truck scale error in the Torrance of Weight and Measure acceptance" the level was Average. On the other hand, for the comment:"I know the impact to the factory revenue if there is a Truck scale error ±30 kg every time when weighing a Truck" the level was high, so the combination of these factors is on the average as $\bar{x}$ = 3.27 and SD = 0.79.

Table 4.5 Means ($\bar{x}$) and Standard Deviation (SD) of database management features which influence the buying decision of Truck scale 3x18 for a cement factory(Database management)

Description	$\bar{x}$	SD	Level
Database management	4.02	0.75	High
- My factory controls and always analyzes productivity by using database management	3.99	0.85	High

Table 4.5 Means ($\bar{x}$) and Standard Deviation (SD) of database management features which influence the buying decision of Truck scale 3x18 for a cement factory(Database management) (Cont.)

Description	$\bar{x}$	SD	Level
- My factory takes it seriously for database management in every production procedure	4.05	0.81	High

Table 4.5 from the survey of product features of the database management factor, the results show that the respondent's opinion agreed with this factor. Therefore, when taking a look in detail at each comment, one found that for:"My factory controls and always analyzes productivity by using database management" the level was high. It was the same for the other comment: "My factory takes it serious for database management in every production procedure."

Table 4.6 Means ($\bar{x}$) and Standard Deviation (SD) of the After-Sales service feature which influences the buying decision of a Truck scale 3x18 for a cement factory(After-sale service)

Description	$\bar{x}$	SD	Level
<u>After-sale service</u>	3.59	0.70	High
-I think my factory staff can fix any problem that occurs with the Truck scale	3.45	1.06	High
- My factory always asks for support from the Truck scale supplier when any problem occurs	3.73	1.05	High

Table 4.6 From the survey of the product feature of after-sales service factor, the results showed that the respondent' so pinion agreed with this factor. Therefore, when taking a look in detail at each comment, one found that for:"I think my factory staff can fix any problem that occurs with the Truck scale" the level was high. It was the same for the other comment: "My factory always asks for support from the Truck scale supplier when any problem occurs."

Table 4.7 Means ($\bar{x}$) and Standard Deviation (SD) of the Truck scale reliability feature which influences the buying decision of Truck scale 3x18 for a cement factory (Truck scale reliability)

Description	$\bar{x}$	SD	Level
Truck scale reliability	4.26	0.87	Very high
- I know how much impact to the factory will be if the Truck scale downtime is for 2 days	4.41	0.84	Very high
- I think it is OK if the Truck scale downtime is for 2 days every month	4.09	1.22	High

Table 4.7 From the survey of the product feature of the Truck scale reliability factor, the results showed that the respondent's opinion agreed with this factor. Therefore, when taking a look in detail at each comment, one found that for" I know how much impact to the factory will be if the Truck scale downtime is for 2 days" the level was very high. This shows that they are very serious with downtime of the Truck scale, even for only two days. For the second comment: "I think it is OK if the Truck scale downtime is for 2 days every month" the opinion was very high, so this shows that they also know the great effect if the Truck scale downtime is for two days every month, because that is not a normal condition of the Truck scale. On the other hand, it also means that they can accept the effect of the Truck scale downtime, but the result showed the level was high.

Table 4.8 Means ($\bar{x}$) and Standard Deviation (SD) of Truck scale Foundation feature which influences the buying decision of Truck scale 3x18 for Cement factory(Truck scale foundation)

Description	$\bar{x}$	SD	Level
Truck scale foundation	4.03	0.85	High
- I know the effect of Truck scale errors if a different settlement of a Truck scale occurs	4.06	0.99	High
- When I think about important components of a Truck scale, the foundation is the one of them	4.01	0.94	High

Table 4.8 From the survey of the product feature of a Truck scale's foundation factor, the results showed that the respondent's opinion agreed with this factor. Therefore, when looking in detail at each comment, one found that for "I know the effect of Truck scale errors if a different settlement of a Truck scale occurs" the level was high. The same was for the second comment: "When I think about important components of a Truck scale, the foundation is the one of them."

Table 4.9 Means ($\bar{x}$) and Standard Deviation (SD) of Truck scale legal for trade feature which influences the buying decision of Truck scale 3x18 for a cement factory (Truck scale legal for trade)

Description	$\bar{x}$	SD	Level
Truck scale legal for trade	3.59	0.83	High
- It would be nice if I can control the truck weight +-10 kg to be a benefit for my factory	3.04	1.46	Average
- My factory is very serious about good governance	4.14	1.01	High

Table 4.9 From the survey of the product feature of the Truck scale legal for trade factor, the results showed that the respondent's opinion agreed with this factor. Therefore, when taking a look in detail at each comment, one found that for:"It would be nice if I can control the truck weight +-10 kg to be a benefit for my factory" the response was Average. This was because, according to the W&M regulation act of legislation (2014) of Truck scales, no person is allowed to adjust or control the weight value of the Truck scale, even only 10kg.Concerning the comment on:"My factory is very serious about good governance" the level was high, which means the employees think that the good factory governance is important for their factory.

Table 4.10 Means ($\bar{x}$) and Standard Deviation (SD) of the Price of the Truck scale feature which influences the buying decision of Truck scale 3x18 for Cement factory (Price of Truck scale)

Description	$\bar{x}$	SD	Level
Price of truck scale	3.67	0.99	High

Table 4.10 Means ($\bar{x}$) and Standard Deviation (SD) of the Price of the Truck scale feature which influences the buying decision of Truck scale 3x18 for Cement factory (Price of Truck scale)(Cont.)

Description	$\bar{x}$	SD	Level
- When I look for the specification of a new Truck scale I always check the price before going into deep detail	3.51	1.25	High
- I always calculate for return on investment when I buy the new Truck scale	3.83	1.06	High

Table 4.10 From the survey of the product feature of the Price of the Truck scale factor, the results showed that the respondent's opinion agreed with this factor. Therefore, when taking a look in detail at each comment, one found that for:"When I look for the specification of a new Truck scale I always check the price before going into deep detail" the level was high. This was the same for the second comment: "I always calculate for return on investment when I buy the new Truck scale."

Table 4.11 Means ($\bar{x}$) and Standard Deviation (SD) of the Trustworthiness of a Truck Scale Company feature which influences the buying decision of Truck scale 3x18 for Cement factory (Trustworthiness of Scale Company)

Description	$\bar{x}$	SD	Level
Trust worthiness of a Truck scale company	3.96	0.62	High
- I always evaluate and qualify the Truck scale supplier before making a purchase	4.30	0.78	Very High
- Product brand is more important than the supplier's name	3.62	0.91	High

Table 4.11 From the survey of the product feature of the Trustworthiness of a Truck scale company factor, the results showed that the respondent's opinion agreed with this factor. Therefore, when taking a look in detail at each comment, one found that for: "I always evaluate and qualify Truck scale supplier before purchase from them" the level was very high. This showed that, for Truck scale suppliers, it is very important for them. For the other comment: "Product brand is more important than the

supplier's name" the level was high. This means that it is not only the supplier's name but the brand of the Truck scale product is also very important for the cement factory to purchase one.

4.3 Analysis of factors influencing the buying decision making of Truck scale size 3x18 meters by a cement factory.

Table 4.12 Mean ($\bar{x}$) Standard Deviation (SD) and the buying decision making level of Truck scale 3x18 meters by a cement factory

Description	$\bar{x}$	SD	Level
1. Truck scale accuracy is very important if I want to buy a Truck scale	4.41	0.80	Very high
2. Truck scale software management data is very important if I want to buy a Truck scale	4.06	0.79	High
3.After sale service is very important if I want to buy a Truck scale	4.57	0.68	Very High
4. Truck scale product reliability is very important if I want to buy a Truck scale	4.55	0.69	Very High
5. Truck scale Foundation is very important if I want to buy a Truck scale	4.16	0.91	High
6. Truck scale which gets approval from W&M for legal for trade is very important if I want to buy a Truck scale	4.53	0.81	Very High
7. Truck scale price is very important if I want to buy a Truck scale	3.87	0.98	High
8. Trustworthiness of a Truck scale supplier is very important if I want to buy a Truck scale	4.3	0.79	Very High

From the results of a sample group survey to assess the factors that directly or indirectly influence the buying decision making of a Truck scale size 3x18 meters of cement factories in Thailand, found that the factors that received a 'very high' level included Truck scale accuracy; After-sales; Truck scale reliability; Truck scale Legal

for trade; and Truck scale supplier trustworthiness. However, for the other factors of Truck scale database management; Truck scale foundation; and Truck scale price all received ‘high’ level from the respondents.

4.4 Hypothesis Testing

The analysis was applied to examine the predictive relationship between independent variables consisting of Demographics, Truck scale accuracy, Database management, After-sale service, Truck scale reliability, Truck scale foundation, Truck scale regal for trade, Truck scale Price, Trustworthiness of the Truck scale supplier, which influences the buying decision making of a Truck scale. The results of the analysis were used to evaluate the strength of any proposed relationship.

Hypothesis H1: Demographics affecting the decision to purchasing Truck scale.

Table 4.13 Gender affecting the decision to buying a Truck scale

Description	t	Sig.
Factor to influence the buying of a Truck scale	-0.374	0.709

*Significance of or below 0.05level

As shown in Table 4.13 are the results of using the T-Test analysis of Gender with the decision to purchasing a Truck scale. Sig = 0.0709 t = -0.374. From these results it shows that Gender makes no difference as a factor to buying a Truck scale at a confident interval of 95%.

Table 4.14 Level of job position affecting the decision to buying a Truck scale

Description	t	Sig.
Factor to influence the buying of a Truck scale	-1.263	0.208

*Significance of or below 0.05 level

As shown in Table 4.14are the results of using the t-Test analysis of the Level of job position with the decision to purchasing a Truck scale:

Sig = 0.208 t = -1.263. From these results, it shows that the Level of job position makes no difference as a factor to buying a Truck scale at a confident interval of 95%.

Table 4.15 Job function affecting the decision to buying a Truck scale

Description	t	Sig.
Factor to influence the buying of a Truck scale	1.608	0.110

*Significance of or below 0.05 level

As shown in Table 4.15 are the results of using the t-Test analysis of the Job function with the decision to purchasing a Truck scale by using the Maintenance compared with other job functions (i.e. Purchaser, Production, Project engineer, Civil engineer, Instrument engineer, Safety engineer). Sig = 0.110 t = -1.608. From these results, it shows that the Job function makes no difference as a factor to buying a Truck scale at a confident interval of 95%.

Table 4.16 Job function affecting the decision to buying a Truck scale

Description	F	Sig.
Factor to influence the buying of a Truck scale	1.509	0.224

*Significance of or below 0.05 level

As shown in Table 4.16are the results of using the F-Test analysis of the job function with the decision to purchasing a Truck scale by comparing the data from Purchaser, Production and other job functions (Project engineer, Civil engineer, Instrument engineer, Safety engineer). Sig = 0.224 t = 1.509. From these results it shows that the job function makes no difference as a factor to buying a Truck scale at a confident interval of 95%.

Hypothesis H2: Truck scale accuracy affecting the decision to purchasing a Truck scale.

Table 4.17 Correlation between Truck scale accuracy affecting decision buying

	Purchasing/buying	
	R	Sig
Accuracy	0.342	0.000

*Significance of or below 0.05 level

Truck scale accuracy and purchasing decision have a correlation on a medium level (r=0.013) with a statistical significance of α = 0.05 (sig = 0.000).

HypothesisH3: Database management affecting the decision to purchasing a Truck scale.

Table 4.18 Correlation between Truck scale database management affecting the decision buying

	Purchasing/buying	
	R	Sig
Database management	0.388	0.000

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation it showed that Database management and the purchasing decision have a correlation on a medium level, as indicated by (r = 0.388) with a statistical significance of α = 0.05 (sig = 0.000)

Hypothesis H4: After-sales service affecting the decision to purchasing a Truck scale

Table 4.19 Correlation between After-sales service affecting decision buying

	Purchasing/buying	
	R	Sig
After sales service	0.189	0.011

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation, it showed that After-sales service and the purchasing decision have a correlation on a low level (r = 0.189) with a statistical significance of α = 0.05 (sig = 0.011).

Hypothesis H5: Truck scale Reliability affecting the decision to purchasing a Truck Scale

Table 4.20 Correlation between Truck scale reliability affecting decision buying

	Purchasing/buying	
	R	Sig
Truck scale Reliability	0.297	0.000

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation, it showed that Truck scale reliability and the purchasing decision have a correlation on a low level (r = 0.297) with a statistical significance of α = 0.05 (sig = 0.000).

Hypothesis H6: Truck scale Foundation affecting the decision to purchasing a Truck Scale

Table 4.21 Correlation between Truck scale foundations affecting decision buying

	Purchasing/buying	
	R	Sig
Truck scale Foundation	0.430	0.000

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation, it showed that Truck scale foundation and the purchasing decision have a correlation on a medium level as indicated by (r = 0.430) with a statistical significance of α = 0.05 (sig = 0.000).

Hypothesis H7: Truck scale legal for trade affecting the decision to purchasing a Truck Scale

Table 4.22 Correlation between Truck scale legal for trade affecting decision buying

	Purchasing/buying	
	R	Sig
Truck scale legal for trade	0.162	0.029

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation, it showed that Truck scale legal for trade and the purchasing decision have a correlation on a low level as indicated by (r = 0.162) with a statistical significance of α = 0.05 (sig = 0.029).

Hypothesis H8: Price of Truck scale affecting the decision to purchasing a Truck Scale

Table 4.23 Correlation between Price of Truck scale affecting decision buying

	Purchasing/buying	
	R	Sig
Price of Truck scale	0.396**	0.000

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation, it showed that the Price of a Truck scale and the purchasing decision have a correlation on a medium level as indicated by (r = 0.396) with a statistical significance of α = 0.05 (sig = 0.000).

Hypothesis H9: Trustworthiness of a Truck scale Supplier Company affecting the decision to purchasing a Truck scale

Table 4.24 Correlation between Trustworthiness of the Truck scale Supplier Company affecting decision buying

	Purchasing/buying	
	R	Sig
Trustworthiness of sales company	0.379	0.000

*Significance of or below 0.05 level

From the hypothesis test of Pearson's correlation, it showed that the Trustworthiness of a Truck scale Supplier Company and the purchasing decision have a correlation on a medium level (r = 0.379) with a statistical significance of α = 0.05 (sig = 0.000).

Conclusion of the factors that influence the buying decision making of a Truck scale size 3x18 meters by cement factories in Thailand.

Table 4.25 Conclusion of the factors that influence the buying decision making of a Truck scale size 3x18 meters by cement factories in Thailand

Factors influencing the buying decision	Hypothesis Statement	Test Results
Demographics	H1:Demographics affecting the decision to purchasing Truck scale ❖ The analysis results showed that it made no difference in demographics (Gender, Level position, Job Function) at the confident interval of 95%.	Rejected hypothesis
Accuracy	H2 : Truck scale accuracy affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on amedium level and there was some significance on a purchasing decision.	Accepted Hypothesis
Database management	H3 : Database management affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a medium level and there was some significance on a purchasing decision.	Accepted Hypothesis
After-sales service	H4 : After-sales service affecting the decision to Purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a low level and there was some significance on a purchasing decision.	Accepted Hypothesis
Reliability	H5: Truck scale reliability affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a low level and there was some significance on a purchasing decision.	Accepted Hypothesis

Table 4.25 Conclusion of the factors that influence the buying decision making of a Truck scale size 3x18 meters by cement factories in Thailand (Cont.)

Factors influencing the buying decision	Hypothesis Statement	Test Results
Foundation	H6 : Truck scale foundation affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a medium level and there was some significance on a purchasing decision.	Accepted Hypothesis
Legal for trade	H7 : Truck scale legal for trade affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a low level and there was some significance on a purchasing decision.	Accepted Hypothesis
Price	H8 : Price of Truck scale affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a medium level and there was some significance on a purchasing decision.	Accepted Hypothesis
Trustworthiness	H9 : Trustworthiness of a sales company affecting the decision to purchasing a Truck scale ❖ The analysis results showed that it had a correlation on a medium level and there was some significance on a purchasing decision.	Accepted Hypothesis

CHAPTER 5
SUMMARY, CONCLUSION & RECOMMENDATIONS

5.1 Summaries

This final Chapter of the study will elaborate the summary of the findings and the analysis in Chapter 4 and present a clear explanation about the influencing factors that relate to the buying decision making of Truck scale size 3x18 meters of cement factories in Thailand. The objective of this research project was to study the factors that directly or indirectly influence the buying decision making of a Truck scale size 3x18 meters by a cement factory. It also aimed to study the criteria of each purchasing factor of a Truck scale size 3x18 meters by a cement factory, and to study the customer behavior of purchasing a Truck scale size 3x18 meters by a cement factory in Thailand. The sampling of this study selection was based on the staff and employees in several cement factories in Thailand, who were involved with Truck scale in their factory. The total number of the sample was 184 people.

The factors that were analyzed were demographic (i.e. gender, level of position, job function); product feature (i.e. Truck scale accuracy, Database management, After-sales service, Truck scale reliability, Truck scale foundation) and the factors that were recognized by experts whom worked in the field (i.e Legal for trade, Price off Truck scale, Trustworthiness of Truck scale supplier company). These factors were assessed to understand how much they influence the buying decision making of a Truck scale size 3x18 meters by cement factories in Thailand. The conclusion and analysis of the study results were interpreted in several contexts, as noted in the following information. In accordance with the output of the data analysis there will also be presented some suggestions and recommendations for some potential future research in this area, or in a similar field.

5.2 Discussion

5.2.1 Demographic characteristics

For gender there was a total of 184 respondents, of which 35 were female (19%) and 149 were (81%). The different levels of position for the participants were

132 people from the Staff position (71.7%); As Section Head there were 24 people (13%); As Department Head there were 20 people (10.9%); On the management level there were 7 people (3.8%). One other person (0.5%) was included, which is usually the case. Almost all factories have the operation or staff level as the majority of employees in the factory. The job function of those who were involved with the Truck scale in a cement factory ranged from maintenance to the production team or users. In the maintenance had 56 people (30.4%); the production team or users had 33 people (17.9%); the purchaser office had 30 people (16.3%); the project engineers were 24 people (13%); the civil engineers were 12 people (6.5%); the instrument engineers were 16 people (8.7%); the safety engineers were 13 people (7.1%). The results showed clearly about the difference with the demographic factors, which did not have any affect with the decision to buying a Truck scale.

5.2.2 Factors that influence the buying decision making of a Truck scale

product feature

For the product feature factor, the overall average was 3.902. For the Truck scale accuracy factor, the average was 3.61. When considering each comment in the questionnaire, it was found that: "I know the impact to the factory revenue if there is a Truck scale error ±30 kg every time when weighing a Truck" had the highest average as 3.9. For the Database management factor, the average was 4.02.When considering each comment, it was found that: "My factory takes it seriously for database management in every production procedure" had the highest average of 4.05. For the after-sales service factor, the average was 3.59.When considering each comment, it was found that: "My factory always asks for support from the Truck scale supplier when any problem occurs" had the highest average of 3.73. For the Truck scale reliability factor, the average was 4.26.When considering each comment, it was found that: "I know how much impact to the factory will be if the Truck scale downtime is for 2 days" had the highest average of 4.41. For the Truck scale foundation factor, the average was 4.03.When considering each comment, it was found that: "I know the effect of Truck scale errors if a different settlement of a Truck scale occurs" had the highest average of 4.06.

5.2.3 Factors that influence the buying decision making of a Truck scale Recognized by experts

For the factor recognition by those with expertise in the field, the overall average was 3.74. For the Truck scale legal for trade factor, the average was 3.59.When considering each comment, it was found that:"My factory is very serious about good governance" had the highest average of 4.14. For the Truck scale price factor, the average was 3.67. When considering each comment, it was found that: "I always calculate for return on investment when I buy the new Truck scale" had the highest average of 3.83. For the Trustworthiness of a Truck scale company supplier factor, the average was 3.96.When considering each comment, it was found that: "I always evaluate and qualify the Truck scale supplier before making a purchase" had the highest average of 4.30.

5.2.4 Hypothesis testing conclusion

By employing the T-test, the F-test ANOVA were used to analyze the demographic factors, including: gender, level of position, job function and the influence they had that related to the purchasing decision making of a Truck scale. The results of this study show an important result for both academic purposes and also for practical purposes.

The demographic analysis on a one-by-one basis started with gender. For this factor, it showed the results of it making no difference in influencing from both male and female employees to buying a Truck scale. For the level of position, the results were the same as for gender, in making no difference and no influence. For the factor of job function, the results were also the same as for gender and the level of position. Therefore, the demographic factors of influence have no significant correlation with the factors that directly or indirectly influence the buying decision making of a Truck scale.

The analysis of the product feature factors: (i.e. Truck scale accuracy, Database management, After-sales service, Reliability, Truck scale foundation) that influence the purchasing of a Truck scale in cement factories in Thailand, in this study found all of these factors influence and have a correlation. There is some significance

on making a purchasing decision. The only difference of each factor was the actual level of correlation which ranged from low, medium, high to very high.

The analysis of the recognition of certain factors by experts: (i.e. Legal for Trade, Price of Truck scale, Truck scale supplier company trustworthiness), that are known to influence the purchasing of a Truck scale by cement factories in Thailand in this study found that all of these factors have a correlation. There was is also found some significance in the purchasing decision with a level of correlation of both medium and low.

5.3 Conclusion

The important findings in this study include the difference of the demographic factors, which the results showed they did not have any influence in the decision to buying a Truck scale. This means that the gender, the level of the position of each employee, and the job function are almost the same status of factors that influence the decision to buying a Truck scale. The results of this research project found that the five most significant factors that both influence and have a very close correlation together are these: 1) Truck scale Accuracy; 2) Database management; 3) Truck scale foundation; 4) Price of Truck scale; and 5) Truck scale supplier Trustworthiness. It is interesting to note that the Truck scale Foundation was recognized as being the most significant of all factors that take an important role in all the factors that influence the decision to buying a Truck scale. As mentioned by Mettler-Toledo AG Industrial(2013), the foundation is the main point of a Truck scale because it operates as being the main component to absorb the force of weight from each vehicle. This means that the foundation must be the strongest part of a Truck scale. The second important factor is the market price of a Truck scale. There were three in-depth interviews undertaken with Truck scale experts. The first two were Mr.Kritchon Metheenopanant, the owner and Managing Director of CJCC Intertade Co., Ltd., and the Advisor of Thai Weights and Measures Association and the second expert to participate was Mr.Angkarn Puangnak, the Head of the Central Bureau of Weights and Measures at the Ministry of Commerce in Thailand. They both have extensive work experience in the field of Truck scales and stated that the price factor is very

significant in influencing the buying decision of a Truck scale for a cement factory. The third important factor was the database management. According to Chad A.Dorn (1999) the database management of a Truck scale is an important part of every business because it will contain all the history of both inbound and outbound vehicles, including the individual product inventory. The fourth important factor was the trustworthiness of the Truck sale supplier. This point was highlighted during the interview with the Truck scale expert Mr. Nattapol Sriaksorn, the Sales Manager of the Industry department at Mettler-Toledo (Thailand) Ltd. and also by Mr.Kritchon Metheenopanant, the owner and Managing Director of CJCC Intertade Co.,Ltd.The last importance factor was the Truck scale accuracy ability, as being a sophisticated meticulous measurement machine.

5.4 Limitations of the Research Project.

Although the conclusion of this specific research is based on only cement factories which hold an interest in buying a Truck scale size 3x18 meters in Thailand, it could be carefully used to represent the cement factories behavior in countries beyond Thailand. In addition, the sample size of the respondents who were used, at just 184 employees, was also relatively small, considering the total population of staff in a cement factory who are involved with Truck scale equipment is much higher.

As indicated in Chapter 1, in the introduction of this study, the level of demand and consumption of cement has grown almost every year from 2005 to 2014. Therefore, as the cement business is growing, then the market competition of each cement factory or cement brand are competing over who can reduce the production cost and potential loss and improve the factory's productivity. Hence, in the future, in the case of any economic change or serious political change, the change of circumstances might negatively affect the results of this study.

Concerning the survey questionnaire, the data was collected in a very limited time period, in order to provide enough time for the researcher to process the information that was delivered by the respondents. The questionnaire was also provided at almost only during the working hours of the day. Therefore, in being so time consuming to complete the questionnaire for all the active staff in a cement

factory to fill-in all their answers, this might have made them not have the genuine length of free time to read through the questionnaire carefully or in detail.

5.5 Recommendations of the study

Based on the findings of the research, there are some suggestions that would be applicable to both the Truck sale supplier to cement factories and also the employees at a cement factory who are involved with a Truck scale in their job. The suggestions are based on the factors that were found to directly or indirectly influence and are very important issues for both target groups to focus on when they either buy or sell the new Truck scale. In the case of a Truck scale supplier, the product features and the service of a Truck scale which influence the cement factory staff to decide to buy are very important to use, so the supplier can improve and make the produce the most suitable for a cement factory to use. On the other hand, for the buyer, they can also use the very same factors as well, to be the main concept to be specific in the product or the supplier specification in TOR (Term of Reference) to make sure they will receive the most suitable Truck scale for their cement factory.

5.5.1Truck scale Foundation

The Truck scale foundation takes on a very important role for the Truck scale, in case of any foundation errors which can create lot of problems, especially for a cement factory. Problems can occur due to the number of Trucks that are dealt with every day and the heavy nature of each Truck in terms of its individual weight. Therefore, the Truck scale supplier company can use the results from this research project to develop a new design which would be specific and very suitable for the cement factory industry in Thailand.

5.5.2 Price of a Truck scale

The market price of the product is still a very sensitive factor according to the results of this study. When taking a look in detail about the customer's concern about the price of the product, the cement factories in Thailand also calculate the value of the Truck scale by using the ROI (Return on Investment). Based on the responses to the questionnaire, the Truck scale supplier needs to prove that the price of the Truck

scale is not too expensive and should emphasize that it is an affordable value for the cement factory to invest in, as it will be very beneficial for them in the long term. This approach will answer any concerns or doubt that the buyer may feel about the exiting price range on offer.

5.5.3 Database management

As was shown in the results of this study, most of the cement factories were concerned about the database management. In this case, the Truck scale supplier can develop some appropriate software by cooperating with staff at the cement factory to make sure that the information stored will relate to the cement factory's specific requirements.

5.5.4 Truck scale supplier trustworthiness

The results of this research project showed that the Trustworthiness is an important factor for cement factories to consider about a Truck scale supplier. As highlighted in section 2.4 in Chapter 2, this factor was recommended by Mr. Nattapol Sriaksorn, the Sales Manager of the Industry department at Mettler-Toledo (Thailand) Ltd., who has been working in the Truck scale industry for many years. As an expert, he explained that the Truck scale is one piece of equipment which is often required to be used by a cement factory for a long life time, which might be more than 10 to20 years long. Therefore, cement factories need to consider the Truck scale supplier or Truck scale vendor who has a positive company profile and has established some excellent working experience in the specific industry of the cement factory. It also became clear in this research that, nowadays, cement factories are very concerned about this factor, as the specific results of this study have proven to be the case.

5.5.5 Truck scale accuracy

This factor is directly related to the factory revenue, in both the profit and the loss of money for a cement factory to be successful or not. As the study results have shown, the cement factory staff are all fully aware of how much impact any simple error of each kilogram in the measurement of the weight of a vehicle will make. Therefore, the Truck scale supplier needs to find or develop the best technology of

measurement for a Truck scale to fulfill this requirement factor for a cement factory to become a financially successful business.

Recommendations of future studies

The researcher has provided the following suggestions as some potential future study projects either in this specific field, or ones related to it:

1) For future study, the research team can also study other industrial equipment to find out what influences factories in the important buying decision for a cement factory, such as assessing the factors involved in purchasing a packing or a filling cement machine, or even the PLC (Portland-Limestone Cement) control.

2) For future studies, the research method can also be used to analyze the factors that influence the buying decision making of a Truck scale in other industries, such as a petrochemical factory or a sugar factory either in Thailand, or in other countries as well,.

3) For future study, the research team can also focus on the factors that influence the buying decision making of a Truck scale size 3x18 meters by a cement factory in other countries. It would especially useful for future research to concentrate their target focus on other developing countries because, in those countries, the level of consumption of cement will be very high due to the expansion of the internal infrastructure, such as roads for transportation or building construction for offices, accommodation and sport facilities.

4) For future studies, the research project can also focus on other types of instruments and equipment that are used in cement factories or other industries, because this research highlighted the factors that are important for all industrial instruments and equipment, such as the accuracy, reliability, and the after-sales service. Obviously, all of these factors hold a very basic, yet ultimately significant, importance as being the factors that are regularly used to measure the quality of all factory equipment in any industry.

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APPENDIX A
SURVEY QUESTIONNAIRE (THAI)

แบบสอบถามงานวิจัย

เรื่อง ปัจจัยที่มีผลต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุกที่มีขนาด 3x18 เมตรของ
โรงงานผลิตปูนซีเมนต์

คำชี้แจง:

แบบสอบถามฉบับนี้จัดทำขึ้นเพื่อใช้เก็บรวบรวมข้อมูลในการทำงานวิจัยซึ่งเป็นส่วนหนึ่งของการทำการศึกษา วิจัยระดับปริญญาโทหลักสูตรบริหารธุรกิจมหาบัณฑิตมหาวิทยาลัยนานาชาติแสตมฟอร์ด

ทางผู้วิจัยขอความกรุณาผู้ตอบแบบสอบถาม โปรดตอบแบบสอบถามตามความเป็นจริง ครบถ้วน และตรงกับความคิดเห็น ของคุณมากที่สุด โดยคำตอบและข้อเสนอแนะที่ได้รับจากคุณจะเป็นประโยชน์อย่างยิ่งในการพัฒนาความรู้ในการขับเคลื่อน ยุทธศาสตร์การสร้างแบรนด์แห่งชาติขอรับรองว่าข้อมูลของคุณจะถูกใช้เพื่องานวิจัย ในครั้งนี้เท่านั้น และการให้ข้อมูลของคุณ ในครั้งนี้จะไม่เกิดผลกระทบใดๆ ต่อคุณทั้งสิ้น

แบบสอบถามในชุดนี้แบ่งออกเป็น 3 ส่วน ดังนี้

ส่วนที่ 1 : แบบสอบถามเกี่ยวกับข้อมูลด้านประชากรศาสตร์ของผู้ตอบแบบสอบถาม จำนวน 3ข้อ
ส่วนที่ 2: ปัจจัยส่วนประสมทางด้านคุณสมบัติของเครื่องชั่งที่มีต่อการตัดสินใจเลือกซื้อ จำนวน 16ข้อ
ส่วนที่ 3: ปัจจัยที่มีต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก จำนวน 8ข้อ

ผู้วิจัยขอขอบพระคุณเป็นอย่างสูง ที่คุณได้สละเวลาอันมีค่า และให้ความร่วมมือในการตอบแบบสอบถามชุดนี้เป็นอย่างดียิ่ง

<u>ส่วนที่ 1</u>แบบสอบถามเกี่ยวกับข้อมูลด้านประชากรศาสตร์ของผู้ตอบแบบสอบถาม

คำชี้แจง: โปรดทำเครื่องหมาย / ลงในช่องว่าง□ ที่ตรงกับข้อมูลของท่านมากที่สุด

1). เพศ: หญิง ☐ ชาย ☐

2). ระดับสายงาน

- พนักงาน ☐
- หัวหน้าฝ่าย ☐
- หัวหน้าแผนก ☐
- ผู้บริหาร ☐

3). แผนกงานของท่าน

- จัดหา/จัดซื้อ ☐
- ฝ่ายผลิต หรือ ผู้ใช้งานเครื่องชั่งรถบรรทุก ☐
- ฝ่ายซ่อมบำรุง ☐
- ฝ่ายวิศวกรรมโครงการ ☐
- ฝ่ายวิศวกรรมโยธา ☐
- ฝ่ายวิศวกรรมเครื่องมือวัดและควบคุม ☐
- ฝ่ายวิศวกรรมด้านความปลอดภัยของโรงงาน ☐

<u>ส่วนที่2</u> ปัจจัยส่วนประสมทางด้านคุณสมบัติของเครื่องชั่งที่มีต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก

หมายเลข 5 เห็นด้วยมากที่สุด

หมายเลข 4 เห็นด้วยมาก

หมายเลข 3 เห็นด้วยปานกลาง

หมายเลข 2 เห็นด้วยน้อย

หมายเลข 1 ไม่เห็นด้วย

ปัจจัยส่วนประสมทางด้านคุณสมบัติของเครื่องชั่งที่มีต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก	ระดับความสำคัญ				
	1	2	3	4	5
1.ฉันรับได้กับความผิดพลาด ±30 กก.ต่อการชั่ง 1 ครั้งซึ่งยังอยู่ในช่วงที่กฎหมายรับรอง ความผิดพลาด					
2. ฉันรับรู้ถึงผลกระทบต่อโรงงานหากมีการชั่งผิดพลาด±30กก.ต่อการชั่ง1ครั้ง					
3.โรงงานของฉันมีการควบคุมและวิเคราะห์ผลผลิตโดยการใช้ข้อมูลจากระบบการจัดการฐานข้อมูลตลอดเวลา					
4.โรงงานของฉันให้ความสำคัญกับการจัดการฐานข้อมูลต่างๆของโรงงานเป็นอย่างมาก					
5.ฉันคิดว่าพนักงานในโรงงานมีความสามารถในการซ่อมหากเครื่องชั่งรถบรรทุกมีอาการเสียหรือ					
6.โรงงานจะทำการติดต่อกับบริษัทผู้ขายทุกครั้งที่เครื่องชั่งรถบรรทุกมีอาการเสียหรือมีปัญหาเกิดขึ้น					
7.ฉันรู้ถึงผลกระทบต่อโรงงานหากเครื่องชั่งรถบรรทุกเสียแล้วต้องปิดซ่อม 2 วัน					
8.ฉันคิดว่าเป็นเรื่องปกติหากเครื่องชั่งของฉันจะเกิดอาการเสียแล้วต้องซ่อมเป็นเวลา 2 วันทุกเดือน					
9.ฉันรู้ถึงผลกระทบต่อค่าความเที่ยงตรงของเครื่องชั่งรถบรรทุกหากฐานรากเกิดการทรุดตัว					
10.เมื่อฉันนึกถึงส่วนประกอบที่สำคัญของเครื่องชั่งรถบรรทุก"ฐานราก"จะเป็นสิ่งหนึ่งที่ฉันนึกถึง					
11.จะดีมากหากฉันสามารถควบคุมน้ำหนักให้เพิ่มขึ้นหรือลดลง 10กก. ทุกครั้งที่มีการชั่งเพื่อผลเป็นผลประโยชน์ต่อโรงงาน					
12.โรงงานของฉันให้ความสำคัญกับเรื่องธรรมาภิบาลเป็นอย่างยิ่ง					
13. เมื่อฉันจะดูในรายละเอียดและคุณสมบัติของเครื่องชั่งรถบรรทุกที่จะซื้อใหม่ฉันจะทำการเช็คราคาก่อนลงในรายละเอียดเชิงลึกเสมอ					

ปัจจัยส่วนประสมทางด้านคุณสมบัติของเครื่องชั่งที่มีต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก	ระดับความสำคัญ				
	1	2	3	4	5
14. ฉันจะทำการประเมินและคัดเลือกผู้ที่จะขายเครื่องชั่งรถบรรทุกก่อนที่จะซื้อเสมอ					
15. ชื่อยี่ห้อเครื่องชั่งรถบรรทุกมีความสำคัญมากกว่าชื่อบริษัทผู้ขายเครื่องชั่งรถบรรทุก					

<u>ส่วนที่ 3</u> ปัจจัยที่มีต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก

หมายเลข 5 เห็นด้วยมากที่สุด
หมายเลข 4 เห็นด้วยมาก
หมายเลข 3 เห็นด้วยปานกลาง
หมายเลข 2 เห็นด้วยน้อย
หมายเลข 1 ไม่เห็นด้วย

ปัจจัยที่มีต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก	ระดับความสำคัญ				
	1	2	3	4	5
1.ความแม่นยำของเครื่องชั่งรถบรรทุกมีผลต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก					
2. ระบบจัดการข้อมูลและฐานข้อมูลของเครื่องชั่งรถบรรทุกมีผลต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก					
3.การบริการหลังการขายมีผลต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก					
4.ความน่าเชื่อถือและความเสถียรในการใช้งานมีผลต่อการเลือกซื้อเครื่องชั่งรถบรรทุก					
5.ฐานรากเครื่องชั่งรถบรรทุกที่แข็งแรงคงทนมีผลต่อการเลือกซื้อเครื่องชั่งรถบรรทุก					
6.เครื่องชั่งรุ่นที่ผ่านการตรวจรับรองการใช้ชั่งซื้อขายมีผลต่อการเลือกซื้อเครื่องชั่งรถบรรทุก					
7.ราคาของเครื่องชั่งรถบรรทุกมีผลต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก					
8.ความน่าเชื่อถือและชื่อเสียงของผู้ขายเครื่องชั่งรถบรรทุกมีผลต่อการตัดสินใจเลือกซื้อเครื่องชั่งรถบรรทุก					

APPENDIX B
SURVEY QUESTIONNAIRE (ENGLISH)

QUESTIONNAIRE

(English Translation)

The Factors That Influence the Buying Decision Making of a Truck Scale size 3x18 meters by Cement Factories in Thailand.

This questionnaire was prepared to collect data for the thesis research as partial fulfillment of the requirements for the Graduate School at Stamford International University, Bangkok. Please provide the most appropriate answers to the following questions. Your kind cooperation and participation on completing the questionnaire will be highly appreciated. Strictly, your information and response will be kept confidential and be used for the academic purposes only.

This questionnaire is divided into 5 sections, as follows:

Part 1: Questionnaire about demographics 3 questions

Part 2: Factors of product features and factors which are recognized by experts in the field 16 questions

Part 3: Factors of decision making 8 questions

Thank you very much for your time and cooperation.

Part 1 Questionnaire about demographics

1). Gender: Female ☐ Male☐

2). Whatis your position at work?

- Staff ☐
- Section head ☐
- Department head ☐
- Management ☐

3). What is your job function?

- Purchaser ☐
- Production or user ☐
- Maintenance ☐
- Project Engineer ☐
- Civil Engineer ☐
- Instrument Engineer ☐
- Safety Engineer ☐

Part2 Factor of Product Feature and the factors which were recognized by experts

Tick No.5 if you 'most agree' and tick to No.1 if you 'disagree'

Factor Product Feature and factor which recognition by expertise	Ranking				
	1	2	3	4	5
1. I feel OK if there is a Truck scale error in the Torrance of Weight and Measure acceptance					
2. I know the impact to the factory revenue if there is a Truck scale error ±30 kg every time when weighing a Truck					
3. My factory controls and always analyzes productivity by using database management					

Part2 Factor of Product Feature and the factors which were recognized by experts

Tick No.5 if you 'most agree' and tick to No.1 if you 'disagree'(Cont.)

Factor Product Feature and factors which are recognized by experts in the field	Ranking				
	1	2	3	4	5
4. My factory takes it seriously for database management in every production procedure					
5.I think my factory staff can fix any problem that occurs with the Truck scale					
6. My factory always asks for support from the Truck scale supplier when any problem occurs					
7.I know how much impact to the factory will be if the Truck scale downtime is for 2 days					
8.I think it is OK if the Truck scale downtime is for 2 days every month					
9.I know the effect of Truck scale errors if a different settlement of a Truck scale occurs					
10.When I think about important components of a Truck scale, the foundation is the one of them					
11.It would be nice if I can control the truck weight +-10 kg to be a benefit for my factory					
12.My factory is very serious about good governance					
13. When I look for the specification of a new Truck scale I always check the price before going into deep detail					
14.I always calculate for return on investment when I buy the new Truck scale					
15.I always evaluate and qualify the Truck scale supplier before making a purchase					
16.Product brand is more important than the supplier's name					

Part3 Factors of Decision making

Tick No.5 if you 'most agree' and tick to No.1 if you 'disagree'

Factors of decision making	Ranking				
	1	2	3	4	5
1.Truck scale accuracy is very important if I want to buy a Truck scale					
2.Truck scale software management data is very important if I want to buy a Truck scale					
3.After sale service is very important if I want to buy a Truck scale					
4.Truck scale product reliability is very important if I want to buy a Truck scale					
5. Truck scale Foundation is very important if I want to buy a Truck scale					
6.Truck scale which gets approval from W&M for legal for trade is very important if I want to buy a Truck scale					
7. Truck scale price is very important if I want to buy a Truck scale					
8.Trustworthiness of Truck scale supplier is very important if I want to buy a Truck scale					

APPENDIX C
PILOT TEST RELIABILITY

Question Items	Cronbach's Alpha if item Deleted
1.I feel OK if there is a Truck scale error in the Torrance of Weight and Measure acceptance	.634
2. I know the impact to the factory revenue if there is a Truck scale error ±30 kg every time when weighing a Truck	.558
3. My factory controls and always analyzes productivity by using database management	.543
4. My factory takes it seriously for database management in every production procedure	.532
5.I think my factory staff can fix any problem that occurs with the Truck scale	.601
6. My factory always asks for support from the Truck scale supplier when any problem occurs	.625
7. I know how much impact to the factory will be if the Truck scale downtime is for 2 days	.578
8.I think it is OK if the Truck scale downtime is for 2 days every month	.634
9.I know the effect of Truck scale errors if a different settlement of a Truck scale occurs	.554
10. When I think about important components of a Truck scale, the foundation is the one of them	.597
11.It would be nice if I can control the truck weight +- 10kg to be a benefit for my factory	.628
12. My factory is very serious about good governance	.556
13. When I look for the specification of a new Truck scale I always check the price before going into deep detail	.615
14.I always calculate for return on investment when I buy the new Truck scale	.521
15.I always evaluate and qualify the Truck scale supplier before making a purchase	.566
16.Product brand is more important than the supplier's name	.588
17. Truck scale accuracy is very important if I want to buy a Truck scale	.8014
18. Truck scale software management data is very important if I want to buy a Truck scale	.8035
19. After sale service is very important if I want to buy a Truck scale	.7967
20. Truck scale product reliability is very important if I want to buy a Truck scale	.7968
21. Truck scale Foundation is very important if I want to buy a Truck scale	.8245
23. Truck scale price is very important if I want to buy a Truck scale	.8550

Table 3.1 Stages in consumer decision making

Question	Judge			ΣR	IC= ΣR/N	Result
	1	2	3			
1.Gender	1	1	1	3	1	Excellent
2. What is your position at work?	0	1	1	2	0.7	Good
3.What is your job function?	0	1	1	2	0.7	Good
4. I feel OK if there is a Truck scale error in the Torrance of Weight and Measure acceptance	1	1	1	3	1	Excellent
5. I know the impact to the factory revenue if there is a Truck scale error ±30 kg every time when weighing a Truck	1	1	1	3	1	Excellent
6. My factory controls and always analyzes productivity by using database management	1	1	1	3	1	Excellent
7. My factory takes it seriously for database management in every production procedure	1	1	1	3	1	Excellent
8. I think my factory staff can fix any problem that occurs with the Truck scale	1	1	1	3	1	Excellent
10. My factory always asks for support from the Truck scale supplier when any problem occurs	1	1	0	2	0.7	Good
11. I know how much impact to the factory will be if the Truck scale downtime is for 2 days	1	1	1	3	1	Excellent
12. I think it is OK if the Truck scale downtime is for 2 days every month	1	1	1	3	1	Excellent
13. I know the effect of Truck scale errors if a different settlement of a Truck scale occurs	1	1	0	2	0.7	Good
14. When I think about important components of a Truck scale, the foundation is the one of them	1	1	1	3	1	Excellent
15. It would be nice if I can control the truck weight +-10 kg to be a benefit for my factory	1	1	1	3	1	Excellent
16. My factory is very serious about good governance	1	1	1	3	1	Excellent
17. When I look for the specification of a new Truck scale I always check the price before going into deep detail	0	1	1	2	0.7	Good
18. I always calculate for return on investment when I buy the new Truck scale	1	1	1	3	1	Excellent

Table 3.1 Stages in consumer decision making (Cont.)

Question	Judge			ΣR	IC= ΣR/N	Result
	1	2	3			
19. I always evaluate and qualify the Truck scale supplier before making a purchase	1	0	1	2	0.7	Good
20. Product brand is more important than the supplier's name	1	1	1	3	1	Excellent
21. Truck scale accuracy is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
22. Truck scale software management data is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
23. After sale service is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
24. Truck scale product reliability is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
25. Truck scale Foundation is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
26. Truck scale which get approval from W&M for legal for trade is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
27. Truck scale price is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent
28. Trustworthiness of Truck scale supplier is very important if I want to buy a Truck scale	1	1	1	3	1	Excellent

APPENDIX D

IN-DEPTH INTERVIEWS

IN-DEPTH INTERVIEW

Topic: The Factors That Influence the Buying Decision Making of a Truck Scale Size 3x18 Meters by Cement Factories in Thailand.

Interviewee: **Mr.Angkarn Puangnak**, Head of the Central Bureau of Weights and Measures, Ministry of Commerce, Thailand

Date of Interview: 1 November 2014

What are the factors that influence a cement factory employee when buying a Truck scale size 3x18 meters?

He said the most important factors of truck scale for a cement factory are three things: Legal for trade, Accuracy, and Reliability. The first, Legal for trade, is important because if a factory uses a Truck scale which is not within the legal regulations, it could damage the company's creditability with their customers, regarding the Truck scale has to comply with the regulations if it is used for commercial reasons. Second is accuracy which is important because this will turn to profit of the factory if they can make the Truck scale as accurate as possible. The price of cement is increasing, not like it was in the past, when cement price was two or three times lower than it is now. If a factory can secure every Truck they weigh then this will save a huge amount of money and this will turn into revenue for the factory. The third factor he mentioned was reliability, because the local environment of a cement factory is not the same as any other factory in terms of dust from the cement. If the factory uses a product which is not an industrial type it could cause problems for them after they use it over a few years. The downtime of the Truck scale will also create a lot of problems.

IN-DEPTH INTERVIEW

Topic : The Factors That Influence the Buying Decision Making of a Truck Scale Size 3x18 Meters by Cement Factories in Thailand.

Interviewee : **Mr.Nattpol Sriaksorn**, Sales Manager of Industry department, Truck scale business direct and indirect channel, Mettler-Toledo (Thailand).

Date of Interview: 2 November 2014

What are the factors that influence a cement factory employee when buying a Truck scale size 3x18 meters?

He said that the trustworthiness of a Truck scale supplier is the most important part as, in his own experience, the Truck scale can last a long active life time. Some Truck scales can be used for more than 15 years, so that is why cement factories want a supplier with a good image and hold a stable long term partnership. Regarding the Truck scale regulations in Thailand it requires factories to calibrate and obtain a stamping from the Central Bureau of Weights and Measures officer at least once to last for two years. If a factory follows any standard like the ISO or other standards, it might require a more regular calibration of the instruments and equipment. This means that the Truck scale is one area that a cement factory has to use an after-sales service, because the checks will have to be done by a third party with the Central Bureau of Weights and Measures officer. Therefore, this does not include preventive maintenance which every cement factory is requested to have done by the Truck scale supplier.

IN-DEPTH INTERVIEW

Topic: The Factors That Influence the Buying Decision Making of a Truck Scale Size 3x18 Meters by Cement Factories in Thailand.

Interviewee: **Mr. Kritchon Metheenopanant**, owner and Managing Director of CJCC Intertade Co.,Ltd., and Advisor of the Thai Weights and Measures Association

Date of Interview: 2 November 2014

What are the factors that influence a cement factory employee when buying a Truck scale size 3x18 meters?

He stated that there are a lot of factors that are important to make the decision to purchase a Truck scale for a cement factory. However, the most significant covers three main issues. The first is about the performance of the Truck scale in terms of the product feature and product lift time. The second is the after-sales service and consultative selling because if a customer wants to build a new Truck scale they will want to know about the very basic knowledge of the Truck scale product in order to make sure that the Truck scale will be suitable for each application and after-sales service. The Truck scale takes a significant role for a cement factory in case of any error that occurs because to not use the Truck scale will have a huge negative effect. The factory would not be able to receive raw material or deliver any goods to customers. The last factor is the price, because a Truck scale product has a price range from about 400,000 to 2,000,000 THB. If a customer does not have the basic knowledge of a Truck scale and uses a Truck scale of a low price they might find that it is not suitable with the factory's application. It also may not be usable because of the local environment of the cement factory. It will become damaged in the short term and have a negative effect on the product in a longer length of time.

BIOGRAPHY

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