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Strategy of Internalizing Main Success Factors  
from 3PL Providers: Focusing on IT System  
Accomplishment

By

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## **Abstract**

Nowadays the business unit is the state of art coordinated by side systems such as Logistics Systems. Especially when it has been innovated with IT systems , the Logistics can control more extended scope in terms of optimizing and visibility.

As time goes by, this kind of innovation has been accumulated in specialized Logistic Company which provide outsourced Logistic services. So the competitive of outsourcing company is depending on how well to facilitate this benefit from the service providers. The success factors are low cost and consistent high service level which is not depending on one specific service provider.

So this thesis intends to find out the strategy for utilizing outsourcing service in Logistics. The thing is that there is an applicable case study with this regards. This case thought that main factor which could get the success factors above through would be the Internalizing of IT systems and highly skilled human resources which usually have been belong to the Logistic service providers.

This case actually implemented this internalization in 3 years (2008~2010). So We have verified whether this internalization worked or not by investigating the visible example cases and related indexes as well as concept of related peoples like project member , direct /indirect customer, supporters of business.

Finally the result gave us the strategic views that this approach must have been right one in virtue of several proofs and results of surveys. Additionally there are considerations that applicant should not forget from the project experiences. I hope this strategic view will help followers in the applicable industry as well as academic results.

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### **List of abbreviation**

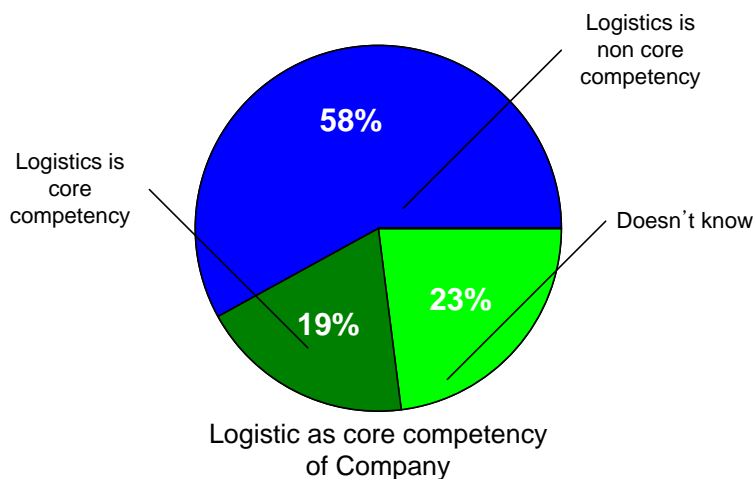
<b><i>IT system</i></b>	<i>Information technology system</i>
<b><i>3PL</i></b>	<i>Third party logistic service for instance DHL</i>
<b><i>Shipper</i></b>	<i>Consignor, client company for instance Samsung</i>
<b><i>Customer</i></b>	<i>Consignee, customer of client company for instance Media market</i>
<b><i>TMS</i></b>	<i>Transport management system such as L2 (logic logistics)</i>
<b><i>WMS</i></b>	<i>Warehouse management system such as Manhattan</i>
<b><i>IOD</i></b>	<i>Information on delivery usually input by carriers</i>
<b><i>OTD</i></b>	<i>On Time delivery performance index for the timely delivery</i>
<b><i>GR</i></b>	<i>Goods receipt in warehouse</i>
<b><i>GI</i></b>	<i>Goods issued from warehouse</i>
<b><i>APICS</i></b>	<i>Advancing Productivity innovation and competitive success</i>

## Chapter 1 Introduction

Chapter 1 will address the motivations for embarking on this research, research objectives, research questions and the methodology with the aim of introducing this research to the readers. The entire research is also structured at the end of this chapter to help with understanding how we ought to approach this study in order to solve the problems which are generated by the research questions.

### 1.1 Introduction

Nowadays the concentration to core value of Companies is accepted practice. So if most of the companies in industry are asked if their logistic competency is one of their core values, then there will rarely be a positive answer. For example in Figure1.1, We can see the results that 81% of companies who answered replied Logistics is not the core value of company or doesn't know in a survey of the 256 biggest companies in Japan(2000).



**Figure 1.1** the perception of Logistics within a Company's core competencies.

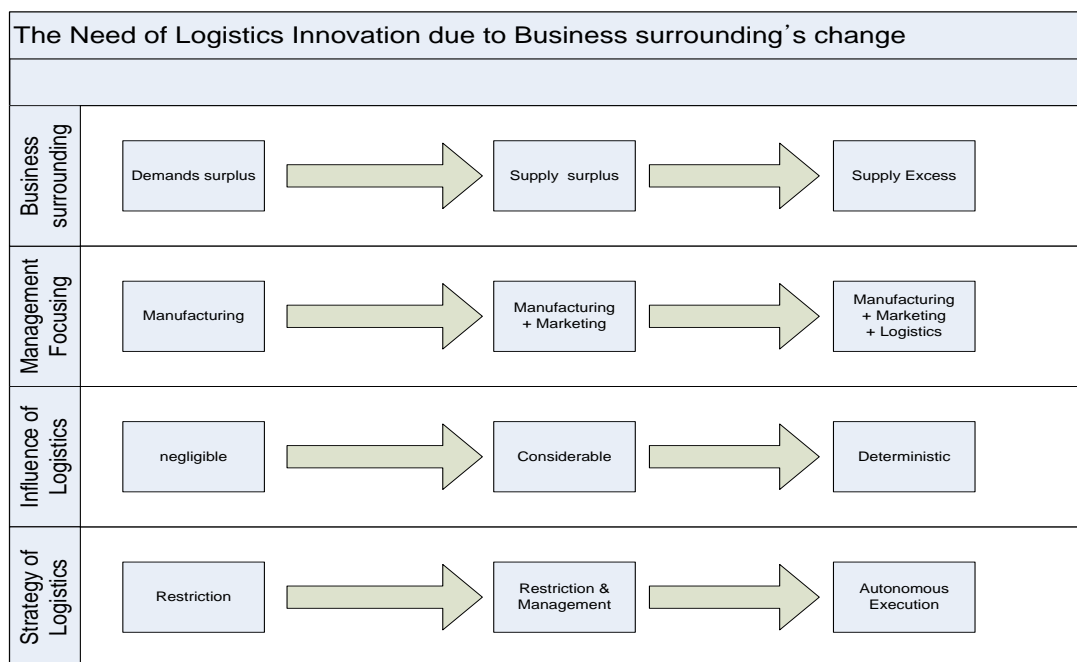
**Source:** Surveys of Japan transportation Institutes to biggest 256 Company.( 2000)

As a matter of fact, it is now common practice to have outsourced Logistics to concentrate on core competencies. In the survey of Song (2007), there is over 20%

annual increase in usage ratio of outsourced logistics in USA companies..By 1995, 60% of Companies in USA started to adopt outsourced logistics solution. There are various reasons that a Company adopt out Sourcing, including feasible costs savings. Most of them would confirm their cutting edge benefit to customers has been this logistics Service which means that Logistics might change their business stream downward or upwards regardless of cost

So it is getting more crucial for the company to organize well balanced Logistics functions in a more efficient way, by trade off between Cost and service.

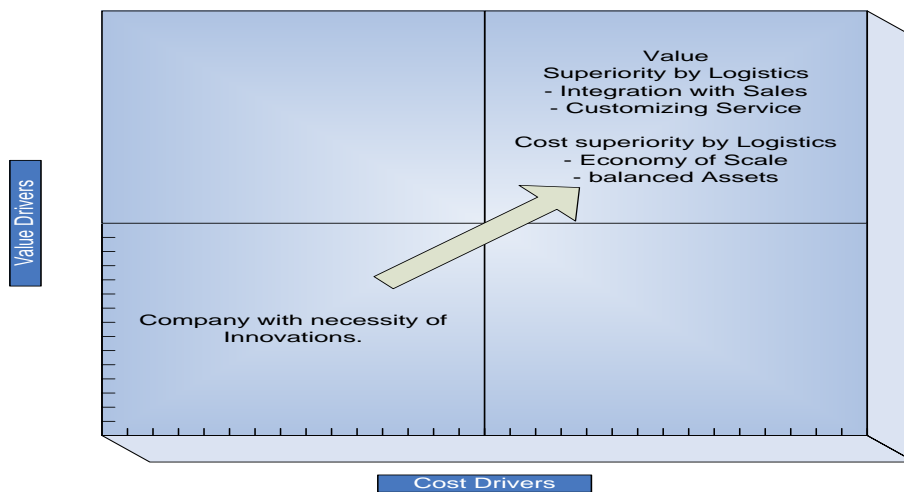
Specially if it is far more cost competitive markets such as commodities which are usually low product value, with logistics cost representing a large proportion in total product cost. We know the possibility has been always with logistics costs to get a competitive advantage over competitors as the base commodity costs are more or less same.(song 2007), then Management would focus their attention on logistics that is actually determining competitive advantage(song 2007) in Figure 1.2



**Figure 1.2** the trend of Logistics Innovation as Business surround's changes

**Source:** Logistics Innovation (song 2007)

As a result, one of the business success factors for now is getting the superiority in Value and Cost together through Logistic innovations like Figure 1.3 this is the reason why now companies try to innovate the logistics, even trading off the cost efficiency and logistics service level.



**Figure 1.3** Business innovation thru Logistics

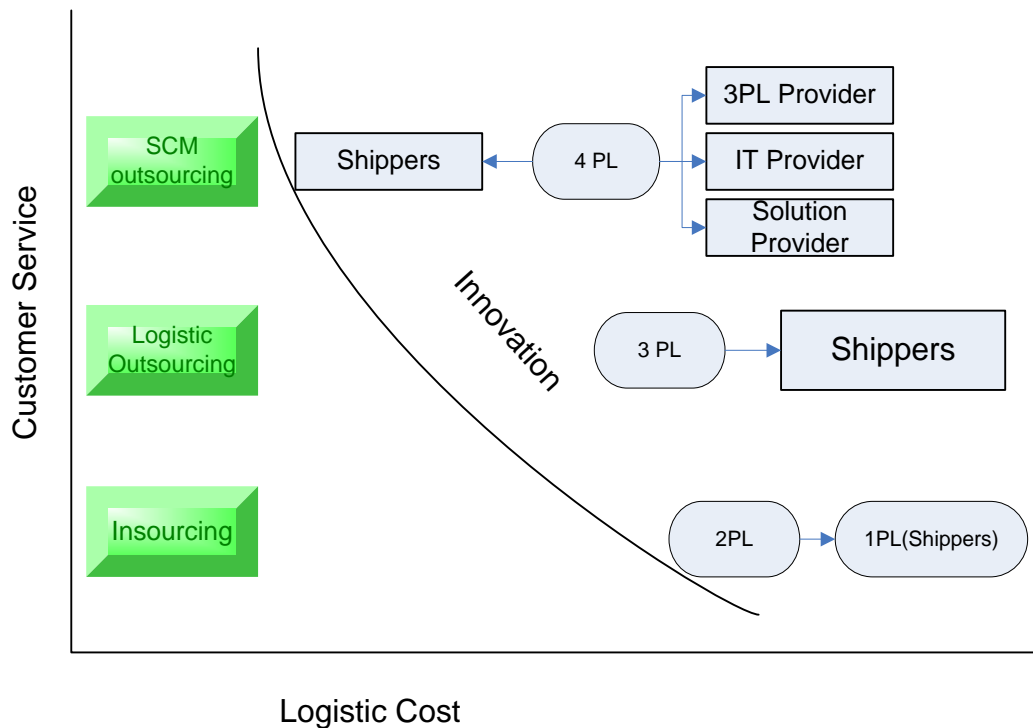
**Source:** Logistics Innovation (song 2007)

During the last several decades, there have been lots of business models that correspond with the needs from the markets. One of most apparent and visible examples is the development of 3PL (third party logistics) business model in logistics. It has developed for the purpose of supporting the efficient outsourced logistics as well as avoiding any risks to core business. It is a kind of extended model such as a Logistics out sourcing. It is different from the previous type of insourcing such as Internal logistic operation (1PL) or daughter Logistics company (2PL) because 3PL provider is a Logistic specialized company for general users, a company with Assets and knowledge. As the demands from customers increased the service level such as IT infra service and Consulting Service, there naturally developed the 4PL (Fourth party logistics) as a highly sophisticated business Partner.

So The User Company can get turn-key Service replacing their internal logistic function. Of course the most compelling reason to let another party take over logistics functions is the decision to focus on core competencies.

In addition, there are many companies which can provide these 3PL or even 4 PL services but there are also difficulties in adopting the correct way of SCM out sourcing. It is therefore very important that each company should have investigated the market and have a clear strategy to choose the right long term partners.

It is hard for companies to survive in this kind of competitive market where every body is concentrating on cost saving. Then the SCM out sourcing results would directly influence the success of core business.



**Figure 1.4** Evolution of Outsourcing Service in Logistics

**Source:** Anderson Consulting 2000 Logistics Workshop

## 1.2 Motivation

In Consumer Electronics, there are trends to be a commodity market due to digital technology. The technology gap amongst the companies is getting narrower day by day because every manufacturer uses the same components with mostly the same level of functions. The remaining difference is only the competitive price from economy of scale in manufacturing and efficient SCM in Logistic innovations.

So the 3PL business has been contagious in consumer electronics business. But there are also pros and cons in perspective of 3PL Business Usages like table1.1, as the more the company starts to adopt 3PL model into their Logistic functions.

	<b>Logistic out sourcing effect</b>	<b>Ratio (%)</b>
<b>Pros</b>	Outsourcing cost reduction	57.7
	Business flexibility improvement	56.3
	Human resource reduction	52.1
	Concentration on the core business	50.7
	Asset cost reduction	38.0
	Logistic Human resource competency improvement	26.8
	IT Usability with Logistics improvements	19.7
<b>Cons</b>	Lost of Controllability to Logistics	35.2
	Same level of time consumptions for logistic	33.8
	no expected cost reductions	25.4
	dissatisfaction for quality of human resources of 3PL	22.5
	dissatisfaction of outsourced service level	21.1
	loss in transit periods for adoption	18.3
	end customer dissatisfaction	12.7

**Table 1.1** Pros and Cons for Logistics Outsourcing (source: Sink and langley, 1997)

The people who support the positive aspects of 3PL are mostly satisfied with cost savings in Assets and human resources, another significant positive is to have higher service level through advanced IT systems and advisory consultants from 3PL/4PL.

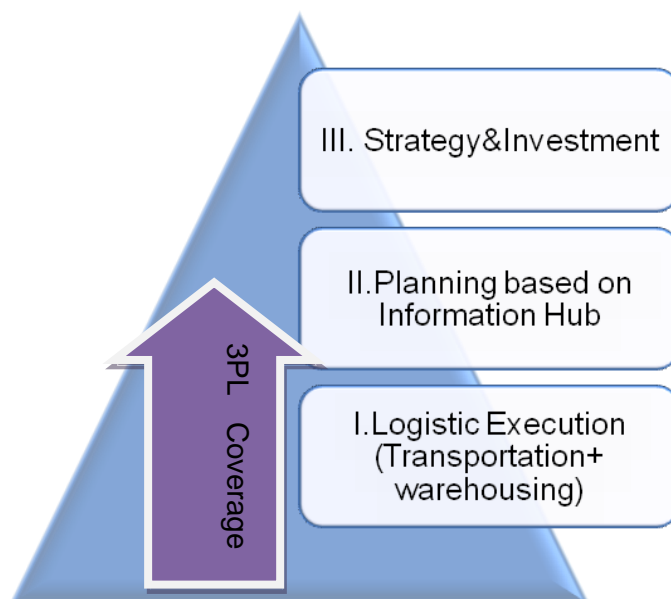
In contrast , the people who are doubtful regarding the 3PL business concept are quoting the fact that the client company might lose the controllability of their logistics and the risk to the business if such an implementation would not be successful, then the end customer also may become dissatisfied. Then this failure from non core business will consequently affect the core business itself.

After a company considers these pros and cons, the company decides to adopt 3PL ,the business challenge still remains to find out the most efficient way to use this 3PL as a type of logistic outsourcing, they will always encounter several questions.

The question is how far do they outsource their logistics functions to a 3PL like Figure 1.5. It seems to be a very simple question but it is actually very extensive and complicated. We have seen some companies that have just given their whole controllability to 3PL which equally means “black box” for the client company. It is

undoubtedly a dangerous decision to execute logistic function in such a way for both 3PL provider company and client company. It would become stagnated in the long term due to the absence of external stimulus such as client company engagement to logistics managements. Consequently they won't continue to build up mutual benefits by working together.

In contrast, the client company is not willing to expose any internal information to 3PL in terms of controllability. It also makes the situation harder to get enough efficiency from the 3PL provider due to limitation of opportunities for restructure and delivering efficiencies. Specifically if it is the case that the client company is lacking in logistics expertise and experience it would considerably reduce the expected outcome from 3PL adoptions



**Figure 1.5** the coverage by 3PL

**Source:** Logistics Innovation (song 2007)

In general, the client company would want to clearly clarify the best way to get 3PL business adopted into their logistic functions that bring value, otherwise the negative aspect of 3PL business might overrule the benefit of 3PL business as you can see the survey results about pros and cons in table 1.1. Finding out the key success factor of 3PL is one of the most serious assignments in the Consumer Electronics business even though there are enormous 3PL provider companies in the market.



### **1.3 Research question and objective**

As mentioned in the introduction, nowadays many companies are struggling to find out their own way for 3PL business implementation. As a Research scope,, we have assigned one Consumer electronic company which adopted 3PL services from 2003 to 2010 with the depth of outsourcing in whole supply chains including Transportation and Warehousing . By using this example and investigating closely we can examine this period, testing the hypothesis and answering the various questions

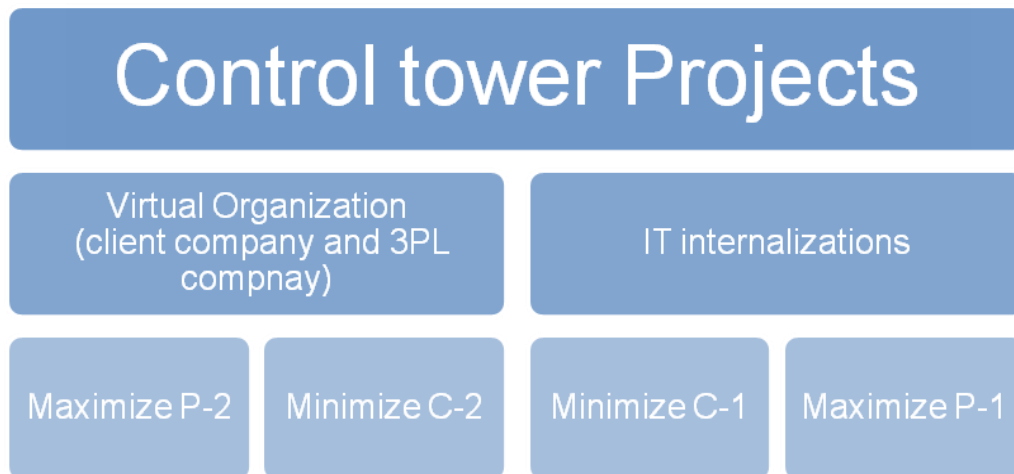
**“What was the key success factor of 3PL business adoption? when this company tried to implement it ”**

To Find out the answer to this question ,we have to look through the pros and cons for 3PL in table 1.1 in advance. Then it can be categorized like table 1.2

	Description	Category
Pros	Cost saving in Operations	P-1
	Higher Service level	P-2
Cons	Loss of controllability	C-1
	Risk for changes in operations	C-2

**Table 1.2** Categorizing of Pros and cons of 3PL business

So the management decides the strategic Project (named control tower project) that boosts the pros and minimize the cons in table 1.2 like Figure 1.5



**Figure 1.6** the control tower project concepts

As this company adopts the 3PL business, there were also two approaches, one of them is the period (named A) from 2003 to 2007 when this company outsourced total logistic business from sole warehousing company including standalone IT business service but separate organization as well. Second is the period (named B) from 2008~2010 when the client company promote the control tower project that internalize IT & set up virtual organization hiring another company to support this changes.



**Figure 1.7** Hypothesis scopes definition

Then we can make up the hypothesis considering the results of changes in above company which have been tried in two different ways, with time differences such as period A and Period B. So our hypothesis to verify is like this.

- **The Internalizing of IT system and Virtual organization are the success factor of 3PL business adoptions.**

In order to prove this hypothesis, we have to check if there really are considerable differences in the two periods and if so, we need to explain how this factor i.e. internalizations made the changes in the 3PL business.

To measure these changes we need to set up the areas to check. One of them is Cost saving and the other one is Service level. From these areas, we will use several indexes to check these 2 main areas.

#### **1.4 Methodology**

The conceptual method is to interpret the relationship between independent variables and dependent variables by examining these 2 investigation groups (Period A and Period B)

The independent variables are to internalize IT systems and organize virtual organization which can be considered together as a control tower project, .

The dependent variables are the success of 3PL adoption which can be measured by both cost saving and higher service level

We know the independent variables are executed in a designed way. In this assumption we can see the actual changes with respect to cost saving and service level in the same company but differentiated time domains.

To measure these changes, we will use 2 approaches, first is to get back the related peoples mind set up for this change by designed survey and second is to calculate the changes by data mining in this company

Then we can also compare the gap between the concept and the data additionally.

We will verify this hypothesis by checking whether those indexed changes are recognized as significant or not.

Speaking of some draw backs of this method, this is very limited scope of testing and might be applied into specific case namely, consumer electronics industry.

By the way this is very practical case study in a company which may not be controlled with respect of designated dependent variables only.

Nevertheless this case study is meaningful because this kind of test is rarely executed due to resource problem in real business surrounding. So it deserves to be considered meaningful as this case study can provide an insight for the many questions made by the a company which wants to run a 3PL business or innovate current 3PL

### ***1.5 Research structure***

The entire research is structured to execute the survey from initiating the question to end up with answers. Each chapter is described as followings

**Chapter 1:** This research is based on the practical questions that most of similar companies encounter while they do the same kind of innovations such as 3PL business set up. Here it explains the methodology that is penetrating this research and object of this research at the end.

**Chapter 2:** the available literature is contributed by practitioner and academic research that are focusing on conceptual modeling as well. Especially the main trend of IT implementation in Logistics is introduced for the background knowledge.

**Chapter 3:** This research is depending on one specific business case, so it describes the conditions and terms of the business case in advance. After that the case study has been interpreted as independent variables and dependent variables in this chapter. Consequently it has been organized as a modeling at the end.

**Chapter 4:** it is mainly focusing the research methodology implementations such as survey questions designing and scope and interpretations with research objective. It explains the corresponding relationship between dependent variables and the methodologies such as survey and data mining and examples.

**Chapter 5:** this chapter is objectively representing the Results of the survey and the meaning of the questions in the surveys. It represents also the statistic index of how this survey gives a confidence level and explainable portion against conclusion.

**Chapter 6:** it analyses the survey results with the corresponding data mining and self explanatory example that confront with the survey questions. It also checks whether these results are aligned well or not. It is a meaningful investigation to make a comparison between the results survey and data mining.

**Chapter 7:** it first clarifies the limitation of this research before it defines the conclusion and it advises the practical tips that has been found on implication from the case study. Finally it recommends the future research topics that this research could not touch.

## **Chapter 2 Literature Review**

### **2.1 Introduction**

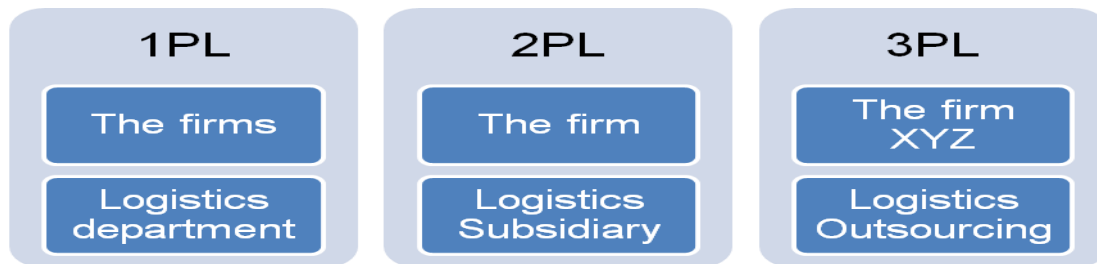
A literature review can help provide insights for good research design and what this research can contribute to the scientific research community that is different when compared to other research studies. In this chapter, three fields of literature are reviewed such as 3PL business , Virtual warehouse and IT system in Logistics

### **2.2 Third party Logistics (3PL) business**

As the most advanced outsourced logistic service, the 3PL business (some times even quoted as 4PL) is now popular in many Logistic businesses. It was the first time for CLM (Council of Logistics management, current CSCMP: Council of Chain management Profession) to use the term, third party providers in the survey (1998) as an origin of 3PL terms. APICS<sup>i</sup> (Advancing Productivity innovation and competitive success, the Association for operations management) encompass 3PL as the concept that it is toward long-term contractual relationships with providers of integrated services, such as transportation plus storage. The 4PL set up extends that trend by removing all logistics functions from the client firm and putting them under integrated management by a general contractor.

It describes the over all logistics parties as follows

- 1PL cases  
the firms as a internal department run logistics functions
- 2PL cases  
the firms as a logistics subsidiary run logistics functions
- 3PL cases  
The firms as outsourced expert company run logistics functions



**Figure 2.1** Overview of logistics trend in perspective of subjects

APICS<sup>ii</sup> described the trade offs of 3PL as follows.

- Improved business focus  
outsourcing one or more logistics functions allows both the firm and its contractors to focus on what they do best.
- More current logistics technology  
Contract logistics providers are generally better able to stay current with technology than the firm that hires them. Of course it assumes that the client firm isn't outsourcing a function it performs especially well.
- Greater technological flexibility  
The 3PL provider is better positioned to adapt to different technologies used by the firm's clients.
- More efficient warehousing for rapid replenishment  
Rapid replenishment may require more warehouses in regions closer to clients, in this purpose, using the 3PL's warehouse is cheaper than building or acquiring the firm's own.
- Improved service to customer  
3PL may be better able to offer a variety of services to the firm's customers.
- More workforce and resource flexibility  
It 's quicker and simpler to hire a contract specialist for a new functions than to hire and fire workers to reflect market changes
- Loss of control
- Potential for in efficiency

## **2.3 Virtual Warehouse**

The SCM has a main objective with decreasing the level of stocks, but it is very hard for MNC (Multi national Company) Headquarters to manage the over all stock level of several subsidiaries in adjacent countries. There has been a move to a solution whereby stock is shared in a concentrated warehouse which is now known as a distribution center.

To implement this concept, each subsidiary needs to be connected in one ERP system, otherwise they cannot see the stock in the distribution center located remotely.

After it has been linked together, it can be handled just like the same stocks in their own physical stocks, in other words they can make up delivery orders with the stock of the distribution center without the downsides.

So each sub can be exempted from the pressures of stock in their warehouse but just share the concentrated stocks which are arranged through forecasting in advance.

Then the solution of a Distribution center provides both the availability and flexibility without risks. Additionally it can be financially compensated by avoiding the incorrectness of forecasting in subs. In other words, it is easier to control Bullwhip effects to one distribution center than several bullwhip effects per each subsidiary. If there is bad aging stock which can be a shortage of stock for another subsidiary, then they just share this stock with Virtual movement in distribution center.

It is now very popular to have virtual warehouse concept's ERP system for MNC companies which is named as intercompany order concept (Capgemini)

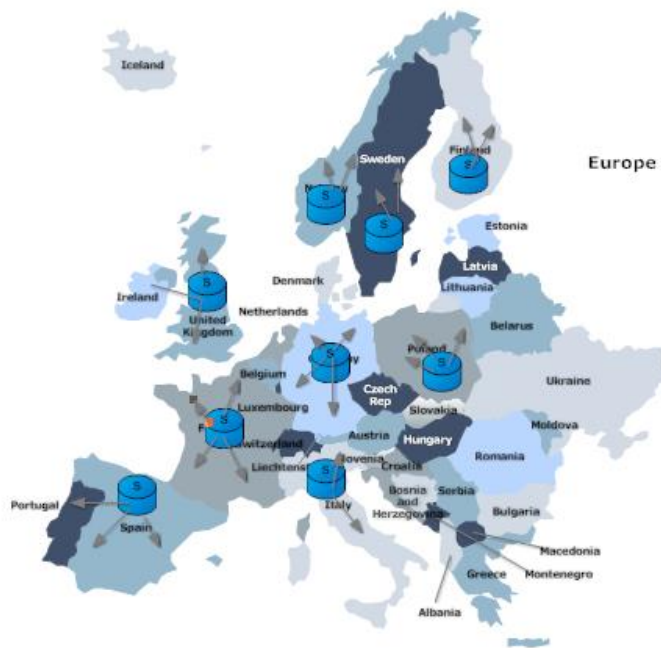
By adopting this package, every sub in certain area which is covered by one specific distribution center can be freed from the pressures of bad stocks and HQ can see the more controllable stocks in one designated warehouse.

So HQ can produce and ship according to the stock level of the distribution center which is more visible and flexible for stock management. In the meantime while there might be a necessity to arrange some value added service in the distribution center because slight differentiation (such as languages) this can be handed over to warehouse from the factory at origin. It noticeably improves the ratio of stock share in such subsidiaries.

It is necessary that there have to be shared services such as order desk in distribution center and efficient transport management. This is one of the main



competitiveness areas in this scenario implementation. For example we can see each subsidiary operate their own warehouse in fig 2.2. In this way they have inflexibility for stock movements due to physical separation of stock even though this subsidiary belongs to one HQ which can be secured by efficient controllability. So if the overflow of Stock A in France subsidiary can be the shortage of subsidiary in Germany. But it is hard to compensate this stock discrepancy due to the physical movement.



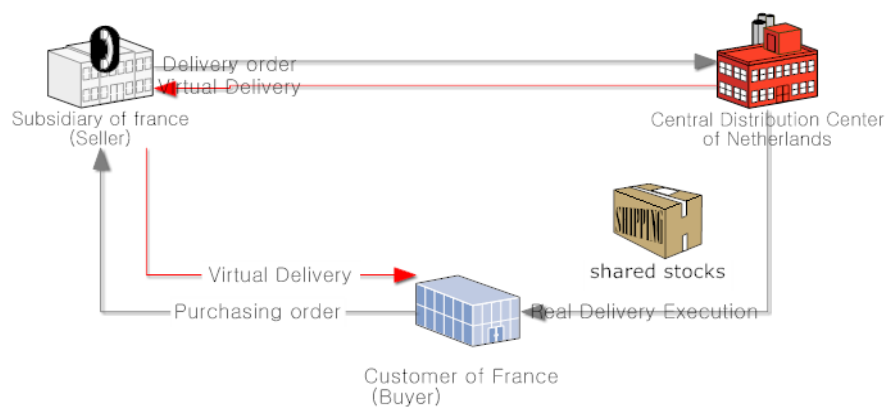
**Figure 2.2** Physical warehouse operation in traditional

But if HQ run the virtual warehouse for each subsidiary at centralized distribution center where there is normally a country logistic such as Netherlands in figure 2.3 Then above discrepancy can be compensated right away within stock movement of ERP system which doesn't need the physical movement.



**Figure 2.3** Virtual warehouse operation in Centralized distribution center

After sharing the stocks among subsidiaries, the execution of delivery is done by the carriage from the distribution center with less cost, due to economy of scale for buying transportation resources from the markets



**Figure 2.4** Virtual Delivery

## 2.4 Information Technology in Logistics

As the business is getting more extended with Globalization, the coverage of information is also extended with various partners. So the old fashioned way of information Technology can not cope with explosive information in the Supply chains. So the Various IT systems now support the Supply chain management like table2.1

System Name	Planning	Operations	collaboration
<b>Supply chain management</b>	<ul style="list-style-type: none"> <li>● Strategic site locations</li> <li>● Inventory deployment</li> </ul>	<ul style="list-style-type: none"> <li>● Online supply chain communications</li> </ul>	<ul style="list-style-type: none"> <li>● Supply chain scheduling and optimization</li> </ul>
<b>Supply management</b>	<ul style="list-style-type: none"> <li>● Replenishment</li> <li>● Sourcing</li> <li>● Negotiation</li> </ul>	<ul style="list-style-type: none"> <li>● Purchasing order creations</li> </ul>	<ul style="list-style-type: none"> <li>● Global sourcing</li> <li>● On line catalogue management</li> </ul>
<b>Retail level planning and optimizations</b>	<ul style="list-style-type: none"> <li>● Assortment planning</li> <li>● Locations planing</li> </ul>	<ul style="list-style-type: none"> <li>● Point of sales solutions</li> <li>● Merchandising operations</li> </ul>	<ul style="list-style-type: none"> <li>● Store and multichannel retailing</li> </ul>
<b>Warehouse management</b>	<ul style="list-style-type: none"> <li>● Warehouse simulations</li> <li>● Work measurement</li> </ul>	<ul style="list-style-type: none"> <li>● Dock management</li> <li>● Shipping</li> <li>● receiving</li> </ul>	<ul style="list-style-type: none"> <li>● Storage capacibility</li> <li>● Warehouse availability</li> </ul>
<b>Inventory management</b>	<ul style="list-style-type: none"> <li>● Inventory simulations</li> <li>● Safety stock optimization</li> </ul>	<ul style="list-style-type: none"> <li>● Lot tracking</li> <li>● Cycle counting</li> </ul>	<ul style="list-style-type: none"> <li>● Forecasting sharing</li> <li>● Inventory auctions</li> </ul>
<b>Transport management</b>	<ul style="list-style-type: none"> <li>● Road routing and scheduling</li> <li>● Consolidation planing</li> </ul>	<ul style="list-style-type: none"> <li>● Freight payment</li> <li>● Shipment tracking</li> </ul>	<ul style="list-style-type: none"> <li>● Transportations auctions</li> <li>● Transport order exchanges</li> </ul>

**Table 2.1** IT application in SCM Business

**Source:** APICS 2008 Using IT to enable SCM (84Pages)

Describing the overview of this logistics functions in SCM, it can be split into 3 main operations ( inbound / internal/ outbound process) most of the main Business ware companies have an assortment of Software products available to reflect this.

Inbound Logistics (Material management)	Internal functions	Outbound Logistics (Physical distribution management)
<ul style="list-style-type: none"> <li>• Procurement</li> <li>• Manufacturing</li> <li>• Inventory management</li> <li>• Receiving</li> </ul>	<ul style="list-style-type: none"> <li>• Enterprise Resource planing</li> </ul>	<ul style="list-style-type: none"> <li>• Demand management</li> <li>• finished goods inventories</li> <li>• Warehousing</li> <li>• Transportations</li> <li>• Service and Parts</li> </ul>

**Table 2.2** Logistics function category in SCM

**Source:** APICS 2008 Using IT to enable SCM (83Pages)

For example, Oracle's enterprise supply chain management package contain the following modules:

- Logistics: Transportations execution, transportation planning, warehouse management and RFID
- Maintenance: Assets, complex MRO(maintenance, repair and overhaul)
- Manufacturing: discrete manufacturing,flow manufacturing, process manufacturing
- Order management: advance pricing configureurator, transportation planning, warehouse management

As a generic category of business package include

- Advance planning and scheduling(APS)
- Supply chain planning(SCP)
- Sourcing and procurement
- Manufacturing
- Inventory and warehouse
- Order fulfillment
- Transportation and distribution

Nowadays there are trends that these kind of SCM business wares are also linked with main ERP systems to comply with one aligned information management purpose.

## **Chapter 3 Case descriptions**

### **3.1 Introduction**

This chapter is designed to describe the definitions of case study and some characteristics of this case. Based on this description, I would like to substantiate verifying factor with hypothesis.

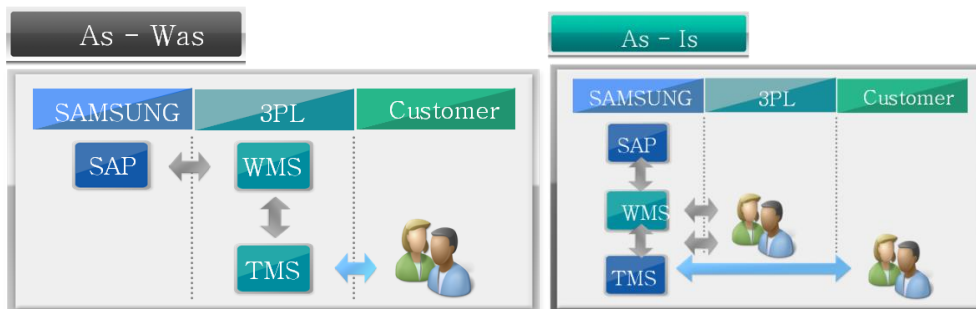
### **3.2 Business case**

From 2001, Samsung (the client company) has run the European distribution center up to now., At first Samsung decided that a 3PL company will be the contracted party which gives Samsung one single point for warehouse and transportation (Managed carriers). Samsung Management decided to set up warehouse and transportations with DHL supply chain management

In soon became evident that there was many barriers to get successful 3PL adoption. It looked like very efficient way rather than in sourcing strategy at first,, but as time goes by , the logistic cost was getting greater even though the logistics service level is same or getting worse. Process innovation activity was decreased year by year. But the most serious fact was that the Samsung were at considerable risk to change from the 3PL company due to these problems because the IT systems such as TMS and WMS belonged to 3PL company. No knowledge for these systems were with Samsung employees which made this from a systems perspective a black box. If Samsung decided to change the 3PL company , Samsung would have to pay the business risk cost as well. So it is hard to change a 3PL company in short period. The expertise in Samsung is not specialized in real Logistics operations. Clearly the employees of Samsung really needed to have the training for skills and the operational knowledge.

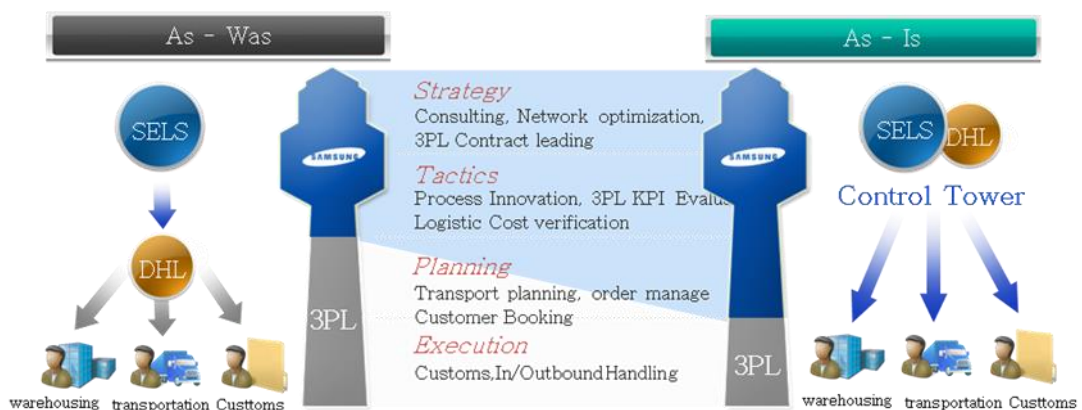
So Samsung decide to get competency with internal resources such as IT systems and virtual organizations as a midterm strategy.

This project name is the control tower and this two main factor can be described in Figure 3.1 and Figure3.2



**Figure 3.1** Logistics IT system internalizations

So every IT systems belongs to Samsung and 3PL just uses Samsung's systems and Samsung can access all data set up and be flexible to change the view or criteria of views. The good thing is that Samsung can manage the Business partner like carriers or warehousing company, more simply without big operational impacts.

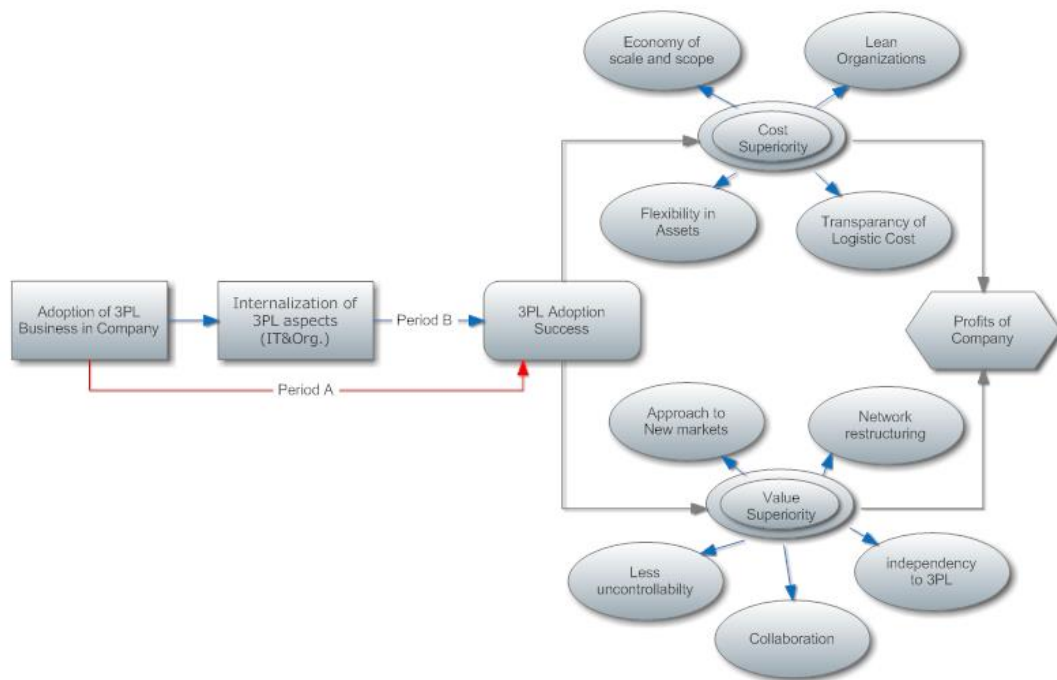


**Figure 3.2** Logistics Virtual organizations

Human resource can cover more scope than before by cooperating more closely in virtual organizations, so no walls between the 3PL company and the client company exists. It accelerates the communication speed and improving skills with the client company employees.

### 3.3 Case modeling

Summing up the business case up to now, We can describe the hypothesis by using the influence diagram in Figure 3.3



**Figure 3.3** the influence diagram of hypothesis.

#### **IT internalization(X1)**

Transforming the 3PL's IT systems(TMS/WMS) into Samsung's IT.

#### **Virtual organization (X2)**

Set up pair organizations between Client company and Service Providers.

#### **Control tower Project (X1\_X2)**

The project which include X1 and X2 independent variables

So we can check the difference between period A and period B in terms of Cost superiority and Value superiority in terms of Y.

With regards to the control of independent variables X1 and X2, there are screening

questions which Independent variables make the difference if there are any differences.

So we make up 3 options as follows.

- A. X 1 is meaningful variable to the changes of Y
- B. X 2 is meaningful variable to the changes of Y
- C. X 1 and X2 are meaningful variables to the changes of Y

From this screening question, we can discriminate independent variables into 2 parts as follows

The people who answer Option A give the unit composed of (X1,Y) and the people who answer Option B give the unit composed of (X2,Y) and finally the people who answer option C give two units (X1,Y) and (X2,Y) each. Then we can see the difference of Y between X1 and X2

There are 2 main kinds of indexes, one is Value and other is Cost  
Each index is composed of sub aspects to check

- Cost related index

**1. Economy of Scale and Scope (Y1)**

this is the benefit from 3PL 's extended resources such as shared services

**2. Lean organization (Y2)**

this is the reduction from decrease of redundancy in organization

**3. Flexibility in asset (Y3)**

This is the possibility to transfer fixed asset to variable assets of user company

**4. Transparency in Logistic Cost (Y4)**

The user company can get visible Cost structures based on ABC analysis.

- Value related index

**1. Approach to new market (Y5)**



this is easiness to get into new area as a logistic service area

**2.Network restructuring (Y6)**

as business circumstance changes , company can respond quickly

**3.Less uncontrollability (Y7)**

the loss of controllability will be minimized due to Systems and close communications.

**4.Collaboration & communication (Y8)**

the walls are broken down between different departments and the company

**5.Independency to 3PL (Y9)**

the reduced risk from 3PL 's unstable serviceability and changes

**6.Logistics performance (Y10)**

the higher KPI index for Delivery and warehouse operations.

these indexes are measured to two different situations such as period A and B. then we will check if this is within in significant levels statistically or not. So we can prove this internalization makes a profit for the company or not which means that this is a success factor of 3PL business.

Secondly, we can go further to the fact which one among X1 and X2 stands for bigger portion of change's reasons by tracking the screening questions.

**3.4 contribution**

This research is based on the specific case study to confront hypothesis question. So it is limited to apply this case study into general industry cases. This case study now has been interpreted as 2 independent variables and 10 dependent variables. In this business case the 2 independent variables are initiated with different timing but same object then we examine the changes of 10 dependent variables .We have each verification per 10 dependent variables by analysis the results from surveys and data mining and corresponding examples.

## Chapter 4 Data collection

### 4.1 Introduction

This chapter presents how the data collection has been executed for this thesis. and then describes the reason why we select specific questions and answer options in real survey.

### 4.2 Designing the data collections

In order to ensure the objectivity of this study, the survey method has been adopted. The Likert 7 point Scale has been used to estimate each variable.

Also this index had to include negative impact.,so we used negative value to represent it correctly. So people get the concept that this is not an ordinal index.

Then the average value means that 0 is no influence or has nothing to do with this point of view from the control tower triggering in the sample. But if the average value is positive or negative then it means that this index has been affected by the control tower changes.

the Likert 7 point scale description

- 3: it has strongly negative influence .
- 2: it has considerable negative influence .
- 1: it has slightly negative influence .
- 0: it has no influence at all
- 1: it has slightly positive influence .
- 2: it has considerable positive influence .
- 3: it has strongly positive influence .

the survey samples are the following samples

- Control tower member
- The client company employee but out of control tower
- 3PL employee
- The customer company

We can foresee the answer might be different depending on their jobs or titles, so

it is meaningful to see how the screened sample answered the questions as well as every respondent.

To discriminate the Independent variables, we have some screening questions

### **4.3 Executing the data collections & analysis**

The period of the survey was from Aug 9<sup>th</sup> to August 13<sup>th</sup> in 2010, and the sample of the survey was associated in Web based survey tool ([www.surveymonkey.com](http://www.surveymonkey.com)).

At first the pretest with 2 colleagues in same office are executed in 6<sup>th</sup> Aug and some screen question are adjusted learned by this pretest.

Then the contact information for this survey are sent to survey samples by email, and a total of 200 surveys were sent by e-mail and 43 surveys were returned. The return rate for the survey was about 21.5% the reason why this return ratio is so low is partially it is summer holiday season. The survey data has been analyzed by using Excel 2003 data analysis plus add-on.

Additionally, to compare this survey with internal data warehousing, we did data mining from period A to Period B. the main data warehousing is extracted from the ERP systems of the client company to the Question 1,2,6,10. and the rest of them can be covered with applicable examples

The availability of this comparison are remarked in table 4.1

<b>que stio ns</b>	<b>Index concepts</b>	<b>Survey Coverage</b>	<b>Data Mining Coverage</b>	<b>Example Coverage</b>
<b>Q1</b>	<b>Cost efficiency</b>	√	√	
<b>Q2</b>	<b>Organization efficiency</b>	√	√	
<b>Q3</b>	<b>Financial flexibility</b>	√	√	
<b>Q4</b>	<b>Cost Visibility</b>	√		√
<b>Q5</b>	<b>Business Development</b>	√		√
<b>Q6</b>	<b>Restructuring Availability</b>	√		√
<b>Q7</b>	<b>Operation Controllability</b>	√		√
<b>Q8</b>	<b>Communications fluency</b>	√		√
<b>Q9</b>	<b>Independency of provider</b>	√		√
<b>Q10</b>	<b>Logistics performance</b>	√	√	

**Table 4.1** analysis method table

## Chapter 5 Survey Results

### 5.1 Introduction

This chapter will represent the results of survey which include 10 main questions about success indexes and 5 screening question about back ground and mind sets related with this investigations.

First, we will show the survey results for main questions if applicable, accompanied with Data mining results in the company, then we can see both results to one topics at one time, then it can tell us the verification of hypothesis.

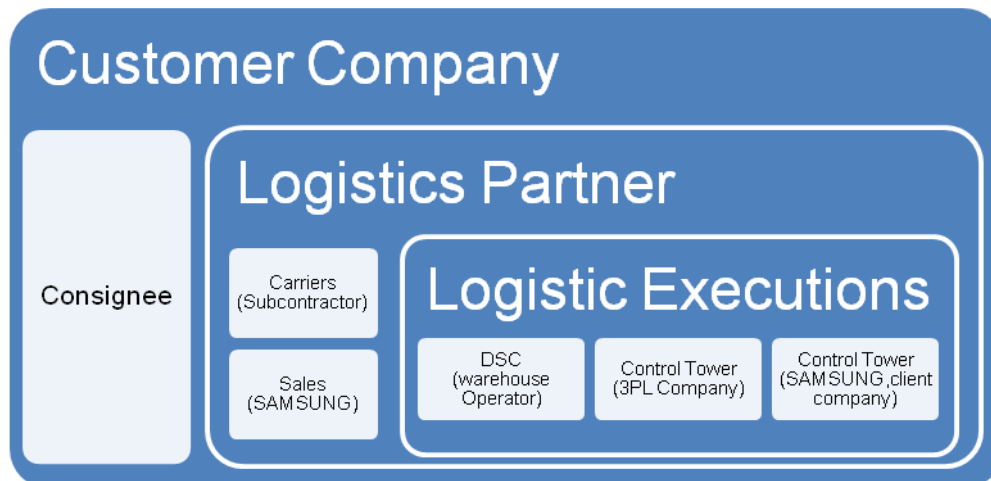
### 5.2 Survey Results Part 1

To give you the idea for subject of this survey, I would like to present the result of screening question first.

Some times, we can see a particular answer from the survey , in that case we can trace out this outlier to explain the extraordinary answers among the answers

#### Q1. Company Type of survey sample

Within the Logistics ecology in Figure 5.1 there are several subjects to be represented as a main role of Logistics Operations.

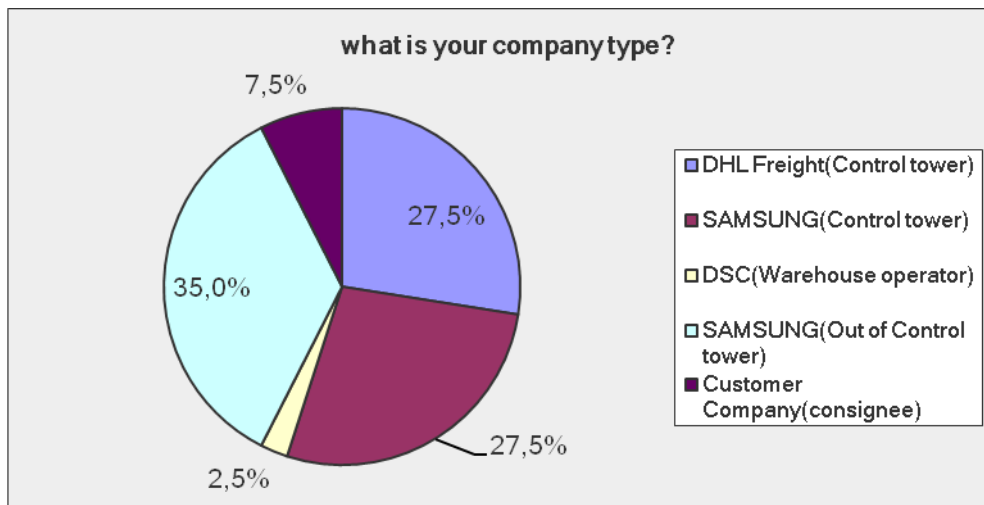


**Figure 5.1** Logistic ecology map

According to Figure 5.1 the map of logistic ecology, we asked the subjects of the survey to identify themselves then the results analysis is as follows. There are more

responses from Logistic partner who have rather objective point of view for main questions as 35% because the People who are belonging to scoped Groups find it is hard to give objective opinion based on reality they feel from outside. The most efficient Group to give the answer for the customer company satisfaction is rather small as 7.5%

what is your company type?		
Answer Options	Response Percent	Response Count
DHL Freight(Control tower)	27.5%	11
SAMSUNG(Control tower)	27.5%	11
DSC(Warehouse operator)	2.5%	1
SAMSUNG(Out of Control tower)	35.0%	14
Customer Company(consignee)	7.5%	3
<i>answered question</i>		40



**Table 5.1** Survey results for screening question 1

As I remarked in independent variables, there has been a virtual organization which is composed of 2 groups of peoples , one from SAMSUNG, and one from DHL freight Benelux as a 3PL service provider, and the ratio of groups are 50% and 50% each corresponding each functions in organizations.

In this virtual organization, there are no walls to communication and freely raised ideas for improvements regardless of their original organizations. We executed the survey for both parties

Besides these Logistics organizations, there are sales organizations to cooperate with these organizations as an order desk for sales and purchasing order processing.,so they were also in scope of this survey as a stake holder of business.

Finally, there are hired warehouse operators named DSC which have assets such as a warehouse and equipment, they are also included as a subject of this survey.

## **Q2. Job Title of survey sample**

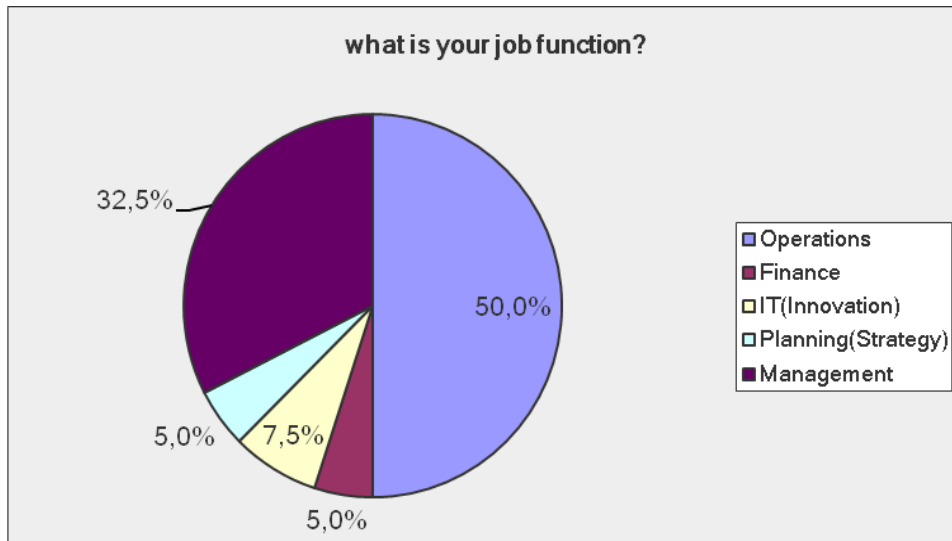
There are questions that are appropriate for management level who have intuitions for running organization. So 32.5 % of answer were collected from management level

There are questions for operational efficiency such as visibility or controllability which can be perceived more easily by operator levels , so 50% of answer are belongs to the group for Operation.

One of the independent variables is IT systems internalizations, so the survey should cover the opinion from IT specialist who worked on this executions as 7.5%

And there are dependent variables which is financial related questions for logistics cost and flexibility of company finances, so finance are included as a scope of this survey as 5%.

what is your job function?		
Answer Options	Response Percent	Response Count
Operations	50.0%	20
Finance	5.0%	2
IT(Innovation)	7.5%	3
Planning(Stratgy)	5.0%	2
Management	32.5%	13
<i>answered question</i>		40



**Table 5.2** Survey results for screening question 2

Finally the planning group who have insights for mid-long term plan for the company are included as 5% as there are questions regarding the business model concerning 3PL dependency. So these kinds of questions are apt to be responded by this group, otherwise the answer will be extracted based on the indirect experiences and perceptions. So we will compare the answer form all subjects and selected subjects.

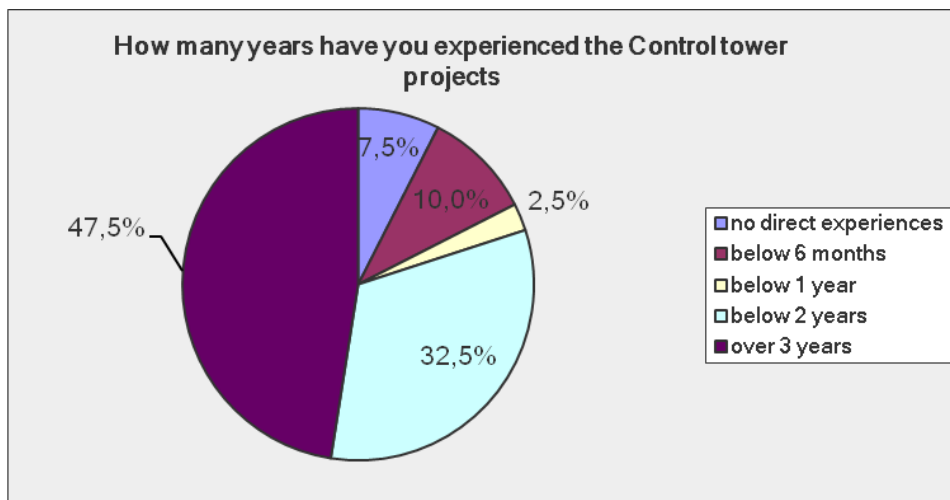
### Q3. Experience of survey sample

As this experiment between independent variables and dependent variables are executed by time domain from 3 years ago. So we have to discriminate the answer from the people who are experienced with this changes and not. But even the people who have no direct experience might have general idea from indirect experiences or perceptions.

As we can see Figure 5.3, 80 % of the answers are collected from the group who have an experience over 1 years which are enough to say the differences about dependent variables. Only 7.5% of answers are from the group without direct experiences but indirect experiences.

So we will analysis the 10 main questions about dependent variables considering the experiences of the answerer. If needed we can exclude this answer to extract some conclusions as a outlier

How many years have you experienced the Control tower projects		
Answer Options	Response Percent	Response Count
no direct experiences	7.5%	3
below 6 months	10.0%	4
below 1 year	2.5%	1
below 2 years	32.5%	13
over 3 years	47.5%	19
<i>answered question</i>		40



**Table 5.3** Survey results for screening question 3

#### **Q4. Control Tower Concept of survey sample**

As an independent variable control, I have inserted this question. There are 2 independent variables but these changes are executed at once, so no discrimination for those 2 independent variables.

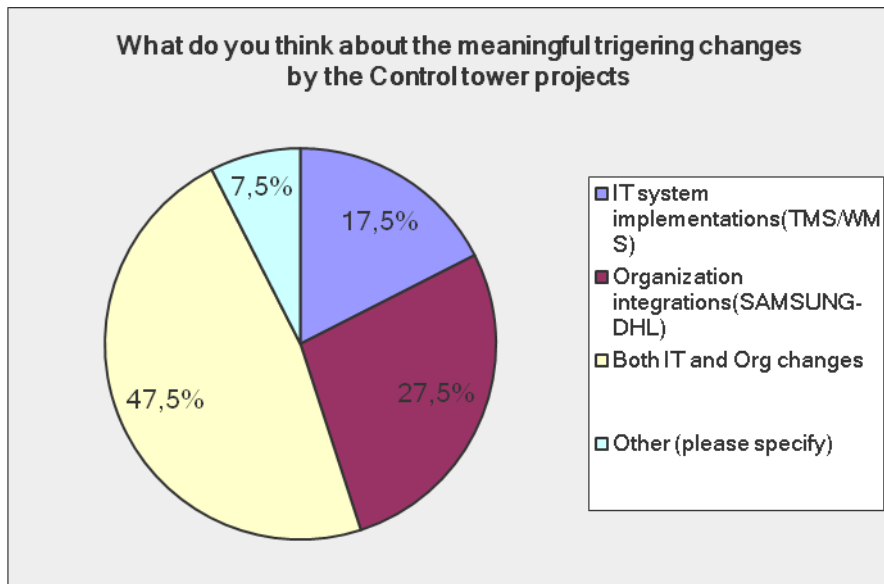
The people who are asked to give the answer for the main questions have been asked first with this question to find out which independent variables they have in mind first.

It can be an interesting comparison to find out which independent variables are more influencing as a success factors between the two variables.

In the next chapter, this analysis approach will be used for some applicable questions



What do you think about the meaningful triggering changes by the Control tower projects		
Answer Options	Response Percent	Response Count
IT system implementations(TMS/WMS)	17.5%	7
Organization integrations(SAMSUNG-DHL)	27.5%	11
Both IT and Org changes	47.5%	19
Other (please specify)	7.5%	3
<i>answered question</i>		40



**Table 5.4** Survey results for screening question 4

There are 17.5% of answers which responded from the persons who think IT system is more influencing factor, and 27.5% of answers from the person who think Organization changes are more influencing variables. 47.5% of people answered both IT and organization changes are influencing factors.

There is 3rd opinion described as a independent variables such as In sourcing strategy, business simplicity

#### Q5. Importance weight to Logistics KSF of survey sample

We have told that the logistic innovation is usually a trade off process between cost and service. So we have asked a simple but principle question about the mind set of logistics success measurements

Generally Logistics Service levels are the same as logistics cost efficiency like in table 5.5. as 57.5% and 42.5% each.

But it is more interesting to check the same results considering their screening groups

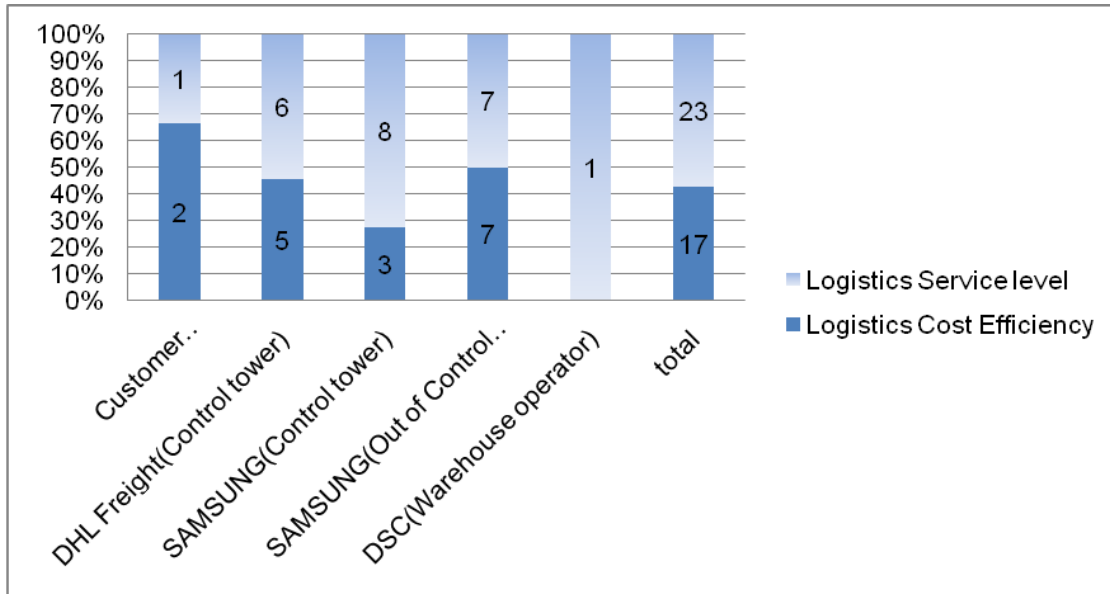
If you have to select one among Cost efficiency and Service level of Logistics, which one do you prefer in your point of view.		
Answer Options	Response Percent	Response Count
Logistics Cost Efficiency	42.5%	17
Logistics Service level	57.5%	23
<i>answered question</i>		40

**Table 5.5** Survey results for screening question 5

First, We have rephrased the answer of Question 5 in perspective of company types as a question 1's answer like Figure 5.2

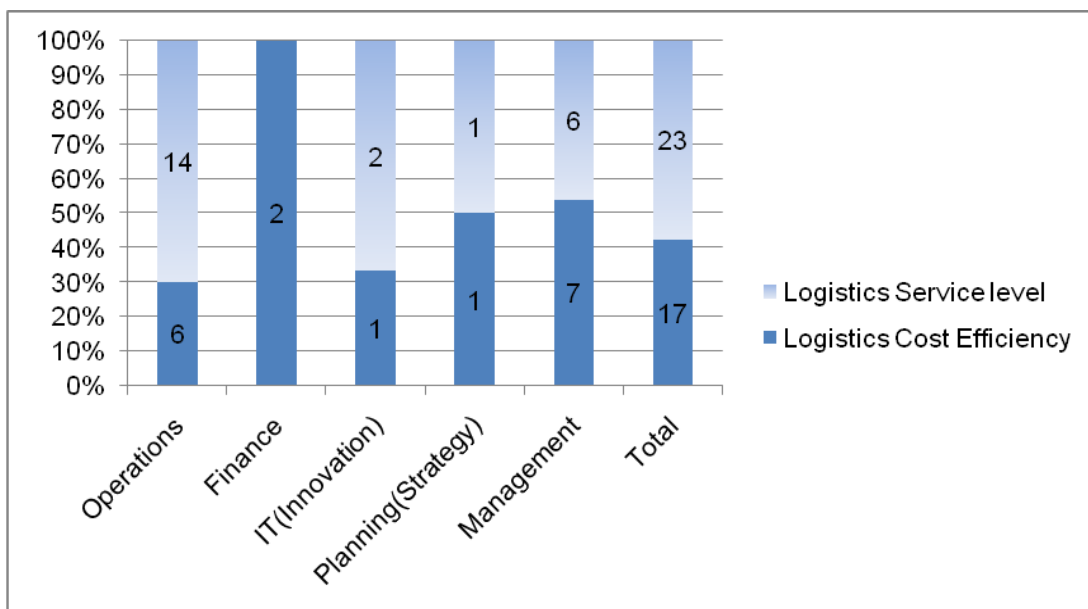
It shows that the customer company prefer the cost efficiency of logistics this can be explained that they usually have a tendency to focus on the logistics cost as part of total product price without more considerations.

Customer Company group such as media mart are usually concerning the quality process after they received the goods with cheap price. So the logistic cost is one of price they just have to pay for this kind of sales driven company, the logistic cost doesn't say many things for the final price for them but just add on price.



**Figure 5.2** Cross View between screening question1 and question 5

The group belonging to Control tower prefer the Service level of logistics then it can be explained that they have greater considerations for the logistic service level while the control tower are trying to get cost efficiency. As a result they are well aware of the value of service level of logistics



**Figure 5.3** Cross View between screening question2 and question 5

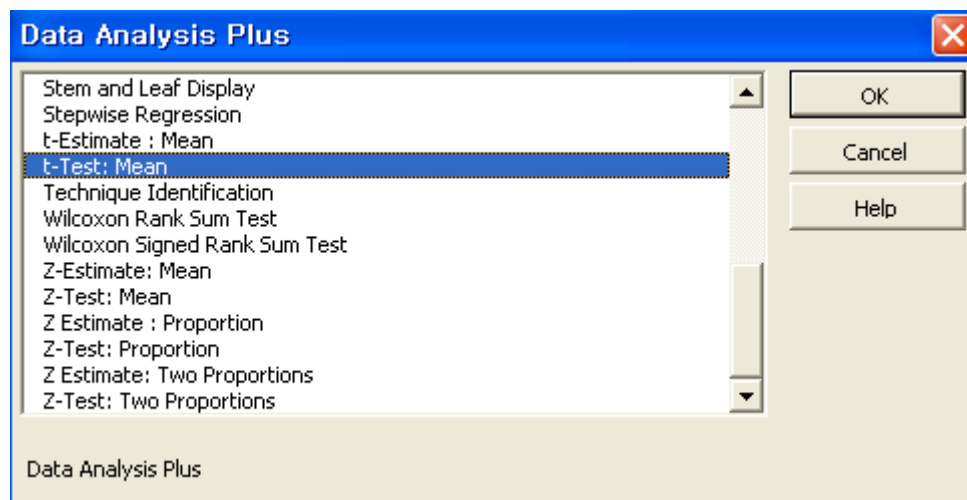
As we see the answer of question 5 according to questions 2 (job title) in Figure 5.3, we can see the trends related with job title, for instance most Operators are focusing on service level only but 30% of operators are also concerning the cost efficiency.

Cost efficiency is far more important to those with a Finance back ground..

It looks like Management are perplexed to have a tendency due to their different department kinds in the company based on the results half and half for this points.

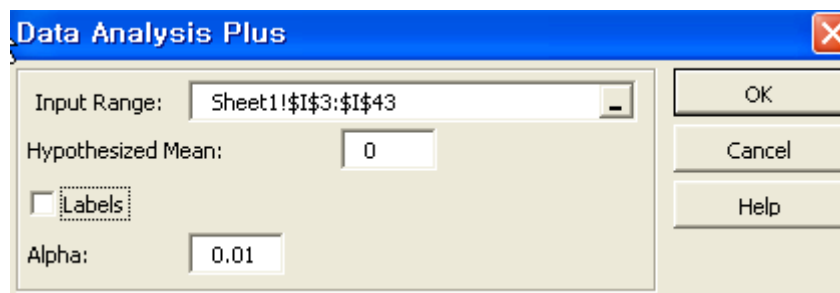
### 5.3 Survey Results Part 2

We have surveyed 10 main questions and got results like following items. So from now on we will look thru the results in statistic method and we will use t-Test Mean in statistics function of Excel 2003 like Figure 5.4 for proving whether this survey results is significant or not. Because we don't know population variance but know hypothesis mean is zero which means no change at all from this independent variables.



**Figure 5.4** Excel 2003 Data analysis plus: t-Test : Mean

then we input survey results ranges and hypothesized mean as 0 and alpha value as 0.01 which means that this result is verified with 1% of significance level like Figure 5.5



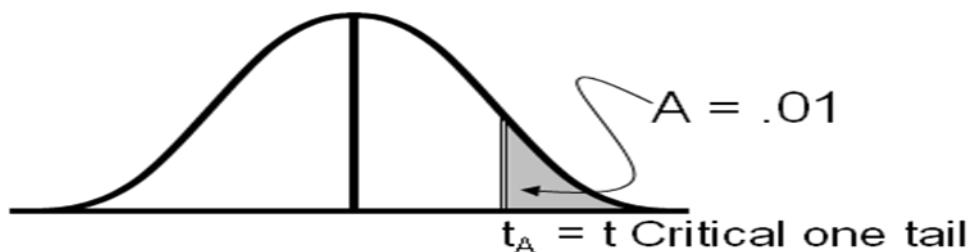
**Figure 5.5** Excel 2003 Data analysis plus: t-Test value input

Then verify our hypothesis comparing the calculated t Stat from Excel against t Critical One tail value which is 1% of significance level in Figure 5.6

If t Stat is greater than t Critical one tail value then we reject null hypothesis( $H_0$ ) in favour of alternative hypothesis ( $H_1$ )

$H_1$ :  $\mu > 0$  (positively influencing)

$H_0$ :  $\mu \leq 0$  (no influence or negatively influencing)

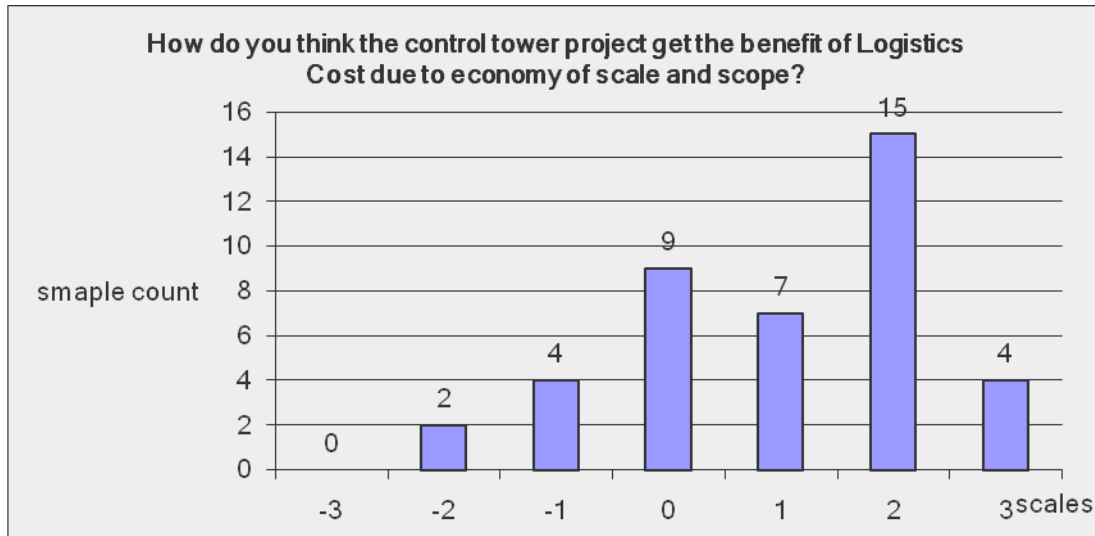


**Figure 5.6** Sample's T- distribution with critical value

### Q1. The Effect of Logistics Cost

This question is aimed to find out the cost saving level from independent variable changes (IT internalization and virtual organization). Because the logistic cost saving level is the most interested index for measuring success of innovations. It has average value as 1.00 and t stat is 4.70 which is greater than 2.42 as t Critical one tail value like table 5.6, so we can reject null hypothesis ( $H_0$ ) in favour of alternative hypothesis ( $H_1$ ) which means that there is enough proof to insist that average effect of logistics Cost Saving influenced by Control tower is positive with 99% confidential level

How do you think the control tower project get the benefit of Logistics Cost due to economy of scale and scope?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
the effect of Logistics Cost	0	2	4	9	7	15	4	1.00	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	1
Standard Deviation	:	1.3601
Hypothesized Mean	:	0
df	:	40
t Stat	:	4.7077
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.6** Survey results for main question 1

One step further 2 samples answer from Finance Group is both +2 each as average is 2 so bigger than 1.360 from the general Averages., so this is even more plausible based on the results from the narrow down sample surveys

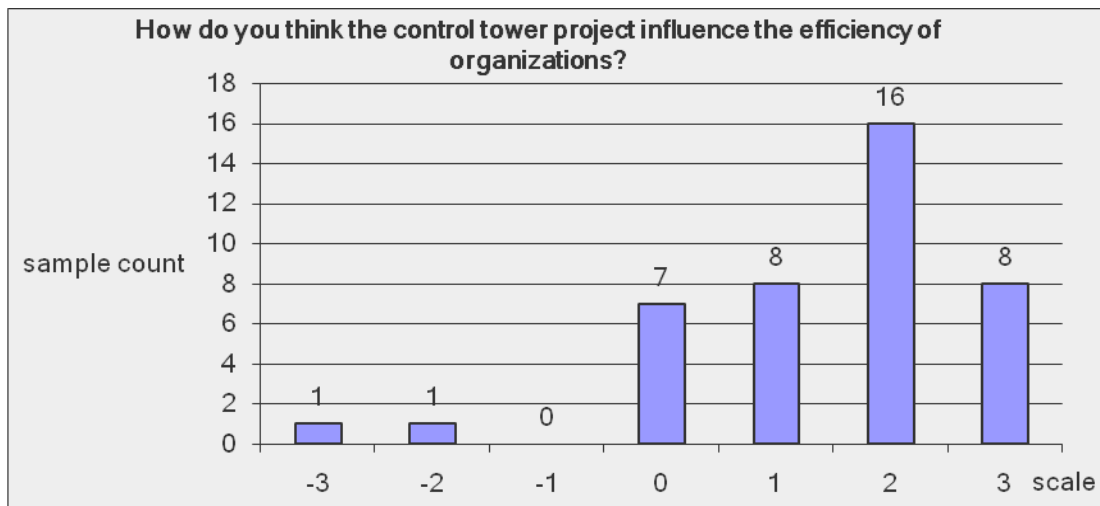
## **Q2. The Effect of efficiency of organizations**

This question is also from the cost driven factor which is related with organization downsizing for labor costs. This scale tells how much this changes affect the downsizing the organization with the same level of work load.

It has average value as 1.439 and t stat is 6.8632 which is greater than 2.4233 as t Critical one tail value like table 5.7, so we can reject null hypothesis( $H_0$ ) in favour of alternative hypothesis ( $H_1$ ) which means that there are enough proof to insist that

average effect of efficiency of organizations influenced by Control tower is positive with 99% confidential level

How do you think the control tower project influence the efficiency of organizations?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
efficiency of organization	1	1	0	7	8	16	8	1.44	41
<i>answered question</i>									41



t-Test: Mean	:	
Mean	:	1.439
Standard Deviation	:	1.3425
Hypothesized Mean	:	0
df	:	40
t Stat	:	6.8632
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.7** Survey results for main question 2

One step further we have done is that this t-Test only with management 13 samples, then the results was more positive as higher average value 1.53 so it is reinforced to

have positive effect on organization because management have more insight for organizations.

t-Test: Mean		
Mean	:	1.5385
Standard Deviation	:	1.7134
Hypothesized Mean	:	0
df	:	12
t Stat	:	3.2373
P(T<=t) one-tail	:	0.0036
t Critical one-tail	:	2.681

**Table 5.8** Survey results for main question 2 with Management samples

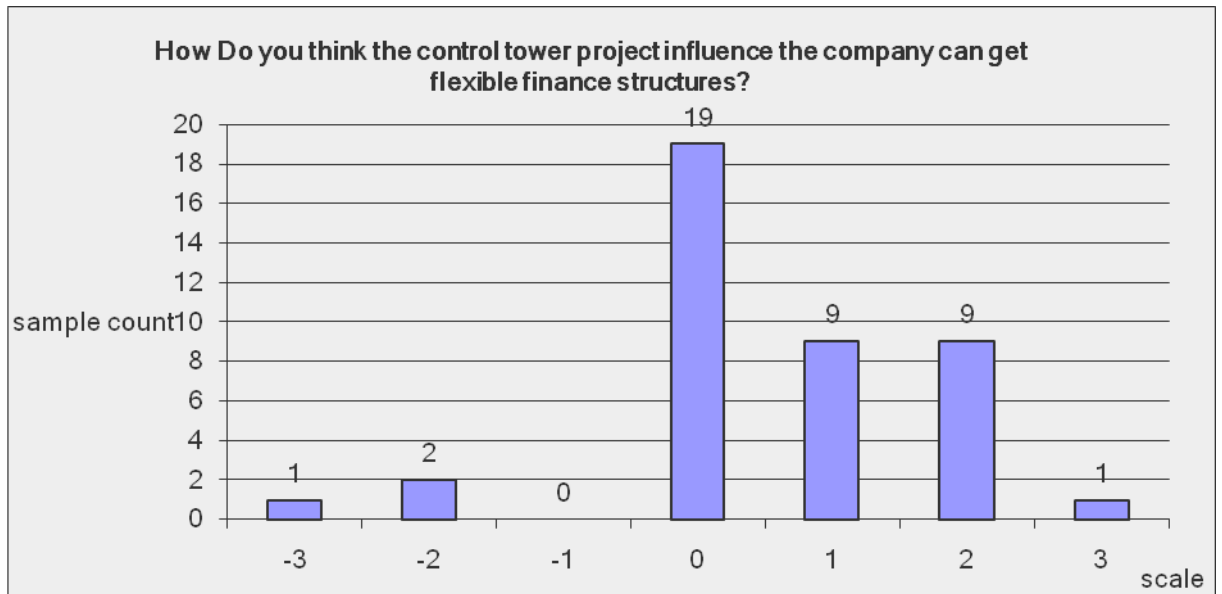
### Q3. The Effect of flexibility of finance

This question is about the index how much the logistic cost are composed against the sales prices, it tells logistics cost ratio of sales price as a successful factor of company because the company can get the availability to do more things rather than logistics which is mandatory service for customer.

It has average value as 0.56 and t stat is 2.98 which is greater than 2.42 as t Critical one tail value like table 5.9, so We can reject null hypothesis(HO) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of Flexibility of Finance influenced by Control tower is positive with 99% confidential level

How Do you think the control tower project influence the company can get flexible finance structures?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
financial Flexibility	1	2	0	19	9	9	1	0.56	41
<i>answered question</i>									41





t-Test: Mean		
Mean	:	0.561
Standard Deviation	:	1.2052
Hypothesized Mean	:	0
df	:	40
t Stat	:	2.9805
P(T<=t) one-tail	:	0.0024
t Critical one-tail	:	2.4233

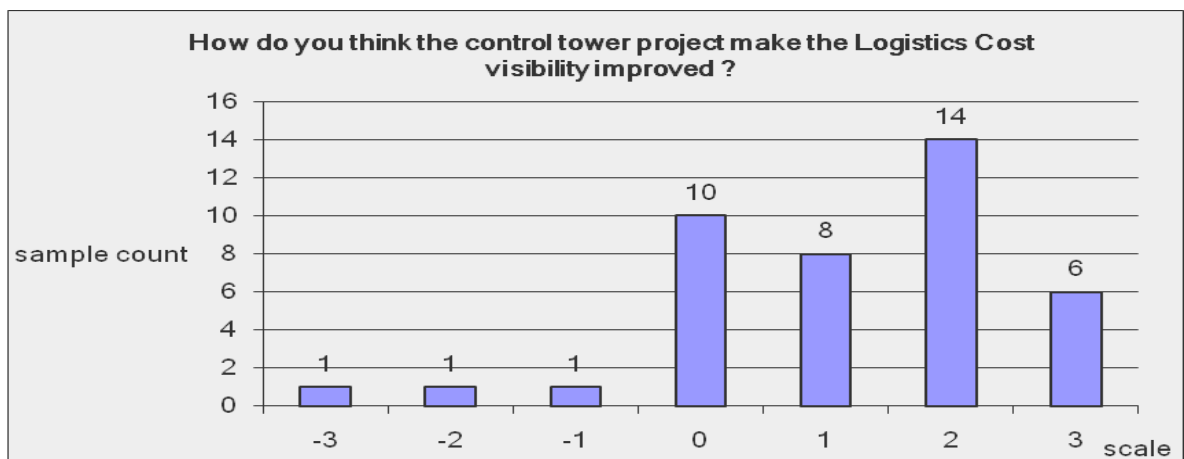
**Table 5.9** Survey results for main question 3

One step further 2 samples answer from Finance Group is +1 and +2 each as average is 1.5 so bigger than 0.561 from the general Averages., so this is even more plausible based on the results from the narrow downed sample surveys

#### Q4. The Effect of Logistics Cost Visibility

It has average value as 1.17 and t stat is 5.44 which is greater than 2.42 as t Critical one tail value like table 5.10, so we can reject null hypothesis(HO) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of Logistics Cost Visibility influenced by Control tower is positive with 99% confidential level

How do you think the control tower project make the Logistics Cost visibility improved ?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
Logistics Cost visibility	1	1	1	10	8	14	6	1.17	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	1.1707
Standard Deviation	:	1.3766
Hypothesized Mean	:	0
df	:	40
t Stat	:	5.4454
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.10** Survey results for main question 4

One step further 2 samples answer from Finance Group is +1 and +3 each as average is 2 so bigger than 1.17 from the general Averages., so this is even more complied with our perceptions when we get the results based on the narrow downed sample surveys

#### Q5. The Effect of easiness to extend new service area

This question is meaningful to see whether this company have a competency to innovate logistics services by autonomous initiatives. If so the company can organize and design the service by themselves rather than purchase already existing services from the market

It has average value as 0.88 and t stat is 4.65 which is greater than 2.42 as t Critical one tail value like table 5.11, so we can reject null hypothesis(H0) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of Logistics Cost Visibility influenced by Control tower is positive with 99% confidential level

How Do you think the control tower project gave the easiness to extend new service area or business?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
the easiness to extend new service	1	1	0	14	11	12	2	0.88	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	0.878
Standard Deviation	:	1.2082
Hypothesized Mean	:	0
df	:	40
t Stat	:	4.6534
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.11** Survey results for main question 5

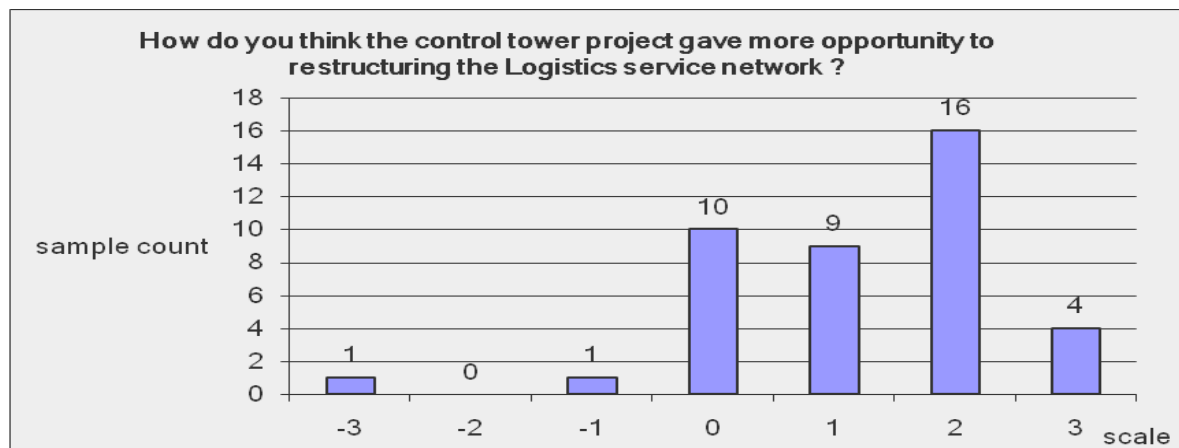
One step further 2 samples answer from Planning Group is +1 and +0 each as average is 0.5 so similar to 0.878 from the general Averages., so this is more or less plausible based on the results from the narrow downed sample surveys

#### **Q6. The Effect of the opportunity to restructuring the Logistics service network**

This question is measuring the competency level to find out improvement point at the provided services from the carrier. Not only to get used to it but also customize the logistics service and modify cooperation with carriers. This is also the kind of index to have governances about service providers. Because nothing will happen without appropriate controllability, even though there are very good ideas to perform. So the IT system internalization and virtual organization needs to be check how much these changes have affected this competency

It has average value as 1.19 and t stat is 6.22 which is greater than 2.42 as t Critical one tail value like table 5.12, so we can reject null hypothesis(H0) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of restructuring the Logistics service network influenced by Control tower is positive with 99% confidential level

How do you think the control tower project gave more opportunity to restructuring the Logistics service network ?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
the opportunity to restructuring the Logistics service network	1	0	1	10	9	16	4	1.19	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	1.1951
Standard Deviation	:	1.2292
Hypothesized Mean	:	0
df	:	40
t Stat	:	6.2255
P(T<=t) one-tail	:	0
t Critical one-tail	:	2.4233

**Table 5.12** Survey results for main question 6

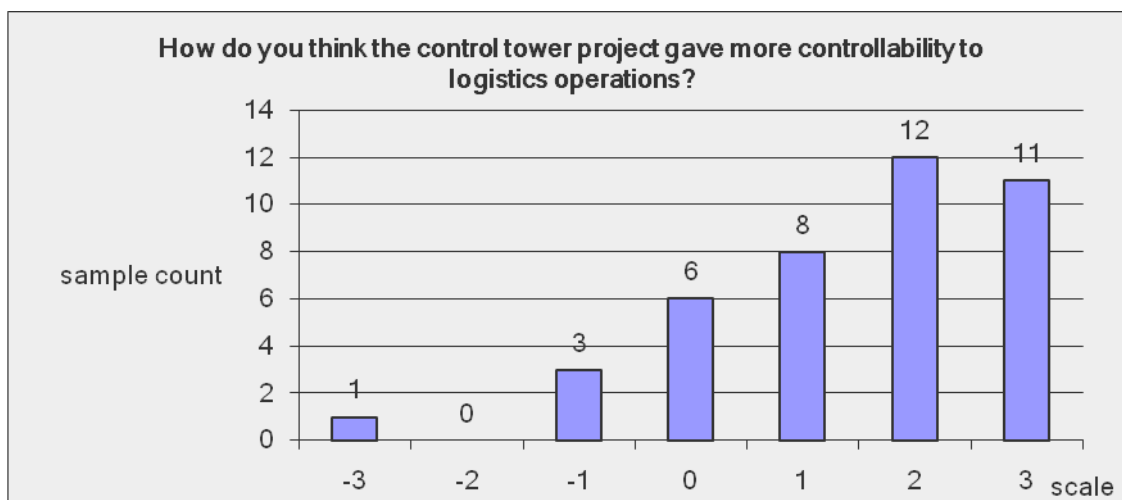
One step further 2 samples answer from Planning Group is +2 and +0 each as average is 1.0 so similar to 0.878 from the general Averages., so this is more or less plausible based on the results from the narrow downed sample surveys

### Q7. The Effect of the controllability to logistics operations

This question is measuring the level of operation by client company, mostly they are far from the actual operation as in operational work, so it is very difficult to have the insight for operation by themselves. But thru virtual organization with flexible It system support, it can be significantly improved up to a micro control level.

It has average value as 1.439 and t stat is 6.43 which is greater than 2.42 as t Critical one tail value like table 5.13, so We can reject null hypothesis(HO) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of restructuring the Logistics service network influenced by Control tower is positive with 99% confidential level

How do you think the control tower project gave more controllability to logistics operations?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
the controllability to logistics operations	1	0	3	6	8	12	11	1.44	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	1.439

Standard Deviation	:	1.4326
Hypothesized Mean	:	0
df	:	40
t Stat	:	6.4317
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.13** Survey results for main question 7

One step further we have done this t-Test only with Operations 20 samples, then the results was less positive as average value 1.35 but standard deviation is lower than one from all samples. So it can be explained that the result in Figure 5.14 is more realistic outcome but more consistent response.

Because some time management or strategic planners have a tendency to go biased according to their prejudices rather than operations.

As a result, it is also stated as T-stat 5.541 which is much bigger than rejection section. Then it is assured by interested Sample group as well.

t-Test: Mean	:	
Mean	:	1.35
Standard Deviation	:	1.0894
Hypothesized Mean	:	0
df	:	19
t Stat	:	5.5418
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.5395

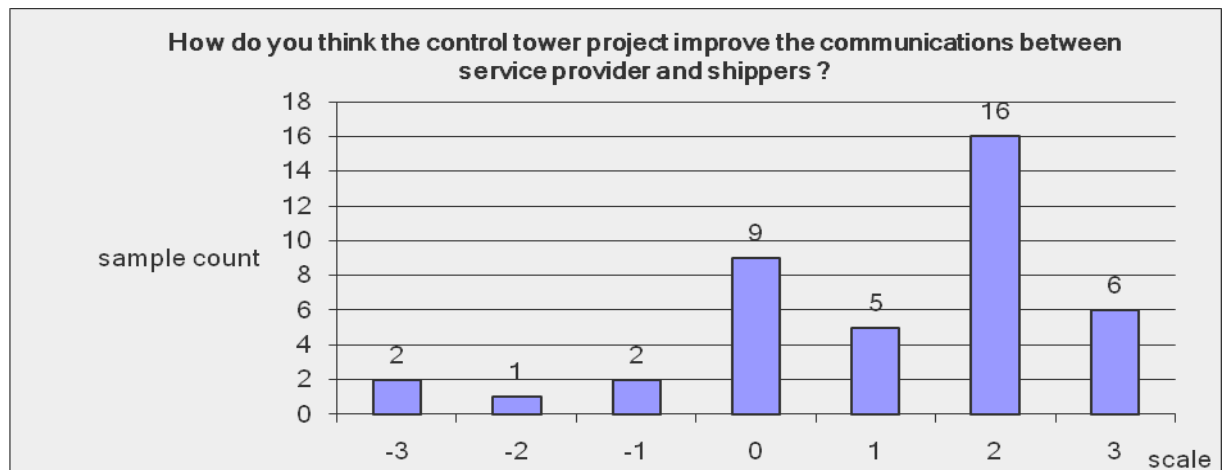
**Table 5.14** Survey results for main question 7 with Operation samples

### Q8. The Effect of the communications between logistic stake holders

Within one logistics business group, there are many stake holders such as carriers, 3PL, client company, consignee company which need fluent communication in terms of cost and reporting and planning. So this question are measuring the improvement in this communication from IT internalization and virtual organization.

It has average value as 1.10 and t stat is 4.4989 which is greater than 2.4233 as t Critical one tail value like table 5.15, so We can reject null hypothesis (HO) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of the communications between service provider and shippers influenced by Control tower is positive with 99% confidential level

How do you think the control tower project improve the communications between service provider and shipper ?									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
the communications between service provider and shippers	2	1	2	9	5	16	6	1.10	41
<i>answered question</i>									41





t-Test: Mean		
Mean	:	1.0976
Standard Deviation	:	1.5621
Hypothesized Mean	:	0
df	:	40
t Stat	:	4.4989
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.15** Survey results for main question 8

One step further We have done this t-Test only with operations 20 samples, then the results was less positive as average value 0.9. but standard deviation is lower than one from all samples. So it can be explained that the result in Figure 5.16 is more realistic outcome but more consistent response.

Because some time management or strategic planners have a tendency to go biased according to their prejudices rather than operations.

As a result, it is also stated as T-stat 3.0177 which is much bigger than rejection section. Then it is assured by interested Sample group as well.

t-Test: Mean		
Mean	:	0.9
Standard Deviation	:	1.3338
Hypothesized Mean	:	0
df	:	19
t Stat	:	3.0177
P(T<=t) one-tail	:	0.0035
t Critical one-tail	:	2.5395

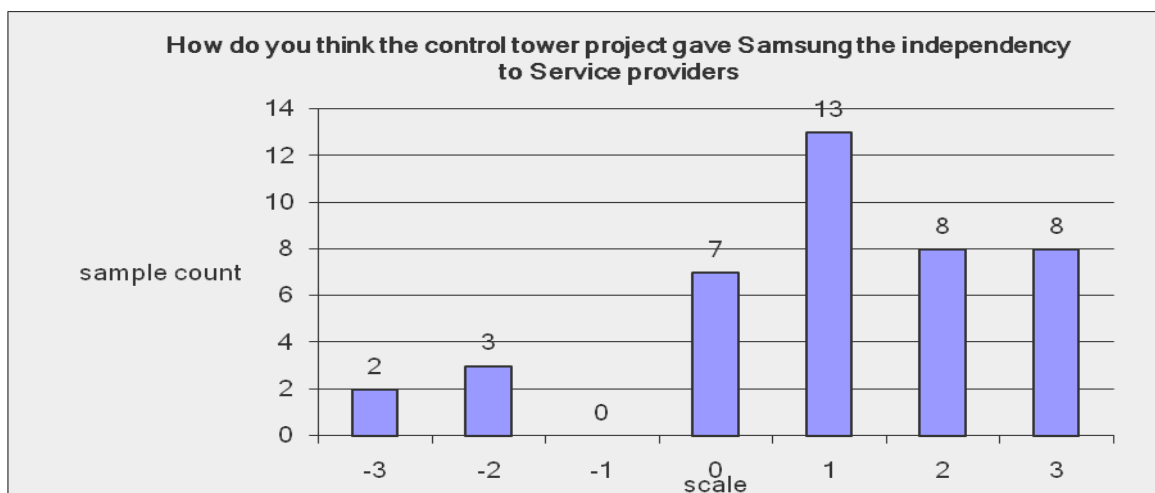
**Table 5.16** Survey results for main question 8 with Operation samples

### Q9. The Effect of the independency for service provider

This question is asking how much the client company can be independent from certain service providers, previously it was too risky to switch the service provider without securing operational stability ,then this stability is hypothesized to be from the It internalization and virtual organization.

It has average value as 1.00 and t stat is 3.93 which is greater than 2.42 as t Critical one tail value like table 5.15, so We can reject null hypothesis (HO) in favour of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of the communications between service provider and shippers influenced by Control tower is positive with 99% confidential level

How do you think the control tower project gave Samsung the independency to Service providers									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
the independency for service provider	2	3	0	7	13	8	8	1.00	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	1
Standard Deviation	:	1.6279
Hypothesized Mean	:	0
df	:	40
t Stat	:	3.9334
P(T<=t) one-tail	:	0.0002
t Critical one-tail	:	2.4233

**Table 5.17** Survey results for main question 9

One step further We have done this t-Test only with Samsung employee 25 samples, then the results was more positive as higher average value 1.4 so it is reinforced to have positive effect on Independency to 3PL because Samsung employee is the interested group in this case .

As a result, it is also stated as T-stat 4.667 which is much bigger than rejection section. Then it is assured by interested Sample group as well.

t-Test: Mean		
Mean	:	1.4
Standard Deviation	:	1.5
Hypothesized Mean	:	0
df	:	24
t Stat	:	4.6667
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4922

**Table 5.18** Survey results for main question 9 with Samsung employee samples

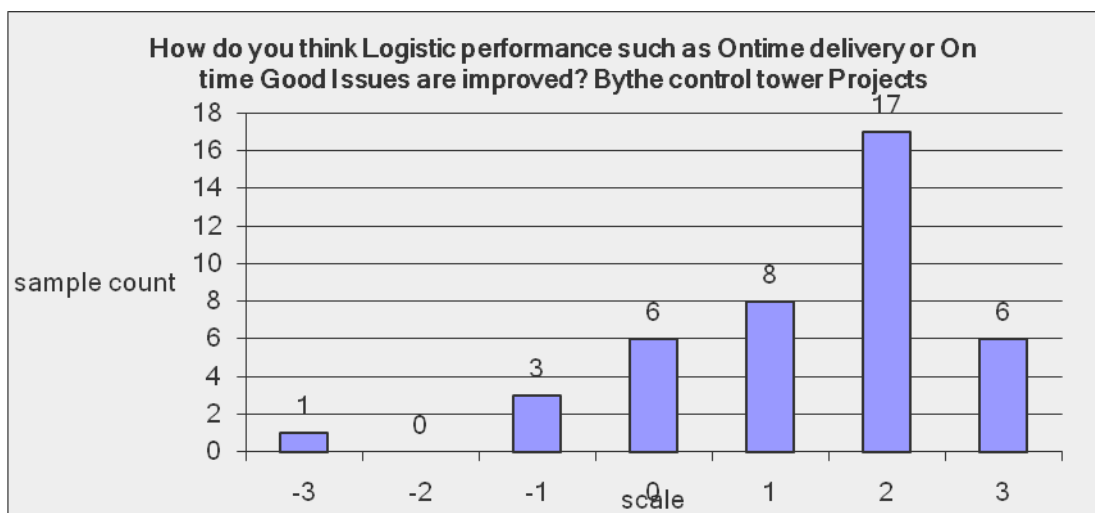
#### **Q10. The Effect of Logistics Performance**

This question is asking whether the logistics performance is felt to be improved or not and how far it was. This is quite subjective index but say something if it is handled by correct person with standardized KPI tools.

It has average value as 1.00 and t stat is 3.9334 which is greater than 2.4233 as

t Critical one tail value like table 5.15, so We can reject null hypothesis (HO) in favor of alternative hypothesis (H1) which means that there are enough proof to insist that average effect of the communications between service provider and shippers influenced by Control tower is positive with 99% confidential level

How do you think Logistic performance such as Ontime delivery or On time Good Issues are improved? By the control tower Projects									
Answer Options	-3	-2	-1	0	1	2	3	Rating Average	Response Count
Logistics Performance	1	0	3	6	8	17	6	1.32	41
<i>answered question</i>									41



t-Test: Mean		
Mean	:	1.3171
Standard Deviation	:	1.3311
Hypothesized Mean	:	0
df	:	40
t Stat	:	6.3354
P(T<=t) one-tail	:	0.0000
t Critical one-tail	:	2.4233

**Table 5.19** Survey results for main question 10

One step further we have done is this t-Test only with operations 20 samples, then the results was less positive as average value 1.2. but standard deviation is lower than one from all samples. So it can be explained that the result in Figure 5.20 is more realistic outcome but more consistent response. Because some time management or strategic planner have a tendency to go biased according to their prejudices rather than operations.

As a result, it is also stated as T-stat 4.4853 which is much bigger than rejection section. Then it is assured by interested Sample group as well.

t-Test: Mean		
Mean	:	1.2
Standard Deviation	:	1.1965
Hypothesized Mean	:	0
df	:	19
t Stat	:	4.4853
P(T<=t) one-tail	:	0.0001
t Critical one-tail	:	2.5395

**Table 5.20** Survey results for main question 10 with operations samples

## 5.4 Survey Results summary

At first, we have used t-Test when we want to verify if some sample results can tell whether this sample has meaningful data value or not.

In this meaning, we have to verify this survey has significant evidence to reject the null hypothesis in favor of research hypothesis. So 10 measurement factors are interpreted as positive changes with 99% credential level. Independent variables worked as positive way at least considering the survey results like table 5.20

<i>quest ions</i>	<i>Index concepts</i>	<i>Sample average</i>	<i>Sample Standard deviation</i>	<i>P-Value (One tail)</i>
Q1	<i>Cost efficiency</i>	1.00	1.360	0.00000125
Q2	<i>Organization efficiency</i>	1.44	1.342	0.00000000
Q3	<i>Financial flexibility</i>	0.56	1.205	0.00143896
Q4	<i>Cost Visibility</i>	1.17	1.376	0.00000003
Q5	<i>Business Development</i>	0.88	1.208	0.00000163
Q6	<i>Restructuring Availability</i>	1.20	1.229	0.00000000
Q7	<i>Operation Controllability</i>	1.44	1.432	0.00000000
Q8	<i>Communications fluency</i>	1.10	1.562	0.00000342
Q9	<i>Independency of provider</i>	1.00	1.627	0.00004187
Q10	<i>Logistics performance</i>	1.32	1.331	0.00000000

**Table 5.21** the t-test results for question 1~10.

## **Chapter 6 Survey analysis**

### **6.1 Introduction**

We will analyze the survey results comparing with data mining results and examples. Actually In chapter 5, we have seen the sample survey averages are meaningful so to reject Null hypothesis. We have seen the comparison results adjusting the sample by screening question's answers. Then finally we can be closer to general conclusion tying up these 10 measurements to changes after Control tower projects.

So to speak we have to analyse the IT internalization and Virtual organization changes ( the concept of control tower project) is the main success factor of 3PL adoptions in this chapter based on previous survey results.

### **6.2 the comparison between survey and data mining / examples**

From now on we will analysis 10 measurement Questions with data mining and example cases. Then we can assume that this survey results from the people are corresponding with the real data in the systems or proof case as example cases

#### **Q1. The Effect of Logistics Cost**

The survey results tells that the control tower has been a positive effect as +1.00 with Confidence level 99% with regard to statistics methods, concurrently we have executed the data mining for logistics Cost for this period ( Jan 2007~ May 2010)

First of all, to define the Logistics Cost unit of measurement, we will use the Logistics Cost as a composition of Warehouse cost and transportation Cost.

To compare it regardless of monthly volume changes, we will use the logistic Cost per handling volume (Cubic Meter; CBM) otherwise the possible absolute change of Volume make corresponding increase or decrease of logistic cost amount. So we will translate the logistic cost into logistic cost per volume as a meaningful index.

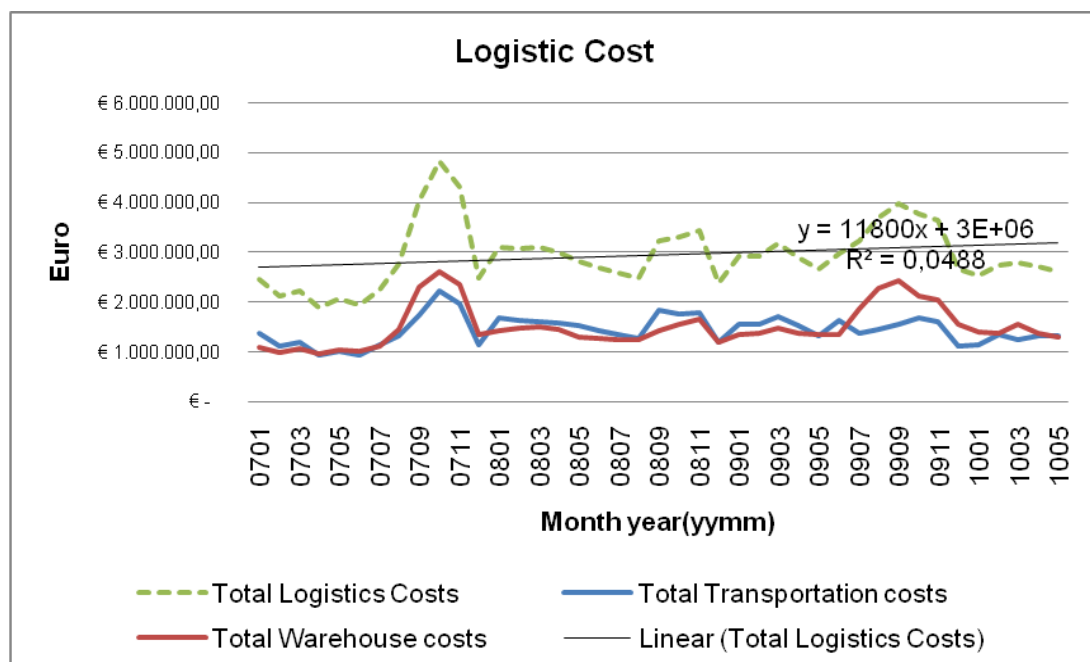
Secondly we will define the moment when the independent variables start to affect as a July 2008 when the control tower project went live.

Thirdly, we will use the regression analysis method to find out any positive trend or negative while this time period goes on in Excel 2003 packages. The plus constant (beta) means that growth and vice versa. And the  $R^2$  represent how much is explained from changes of X variable which is month in this time domain trend. The fact that logistics cost is reconciled by each month and paid by monthly is the reason the minimum logistic cost analysis level of Time domain is month.

The logistics cost is composed of warehouse cost and transport cost per month. As you can see the dotted line in Figure 6.1, there are annual trends for logistics cost to have peak season from September to November in every year. This is the reason why always during this period has bigger logistic cost and handles greater volume.

If we do regression analysis on this trend per month, there are increasing slope(beta) as 11800(euros) which is monthly increasing from January 2010 to may 2010 as followings.

**The regression equation for logistic Cost:  $Y = 11800X + 3E+06$**



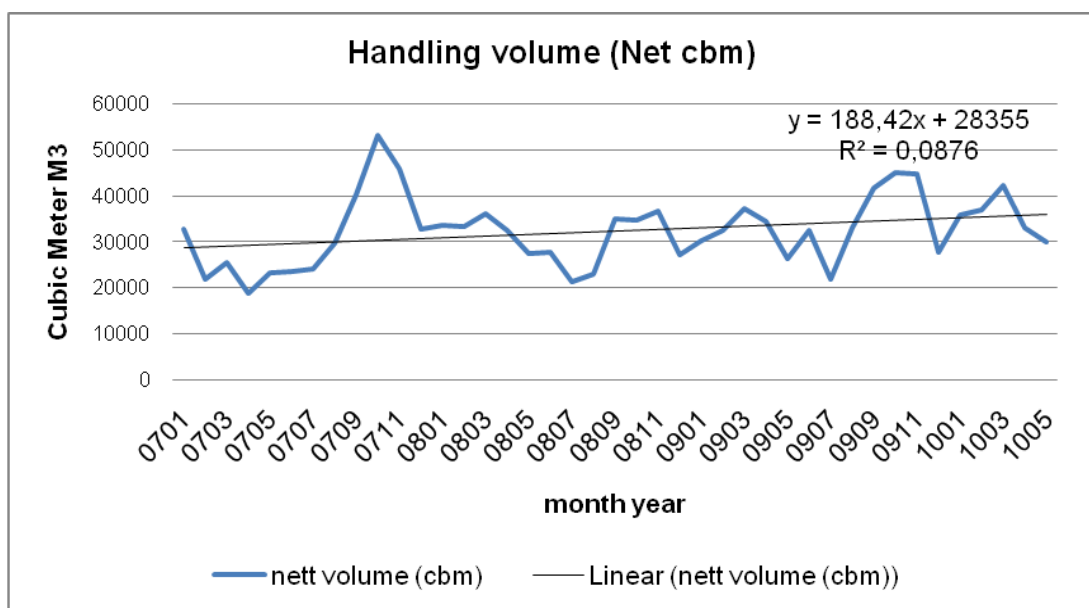
**Figure 6.1** Logistic Cost trend



but this is just growing trend which are dependent on handling volume increase. So we cannot say logistic cost is simply increased at this period without considering the increasing handling volume.

Actually there are increase as 188.4 CBM per month from January 2010 to May 2010 like Figure 6.2 and following regression equations

**The regression equation for handling volume :  $Y = 188.4X + 28355$**

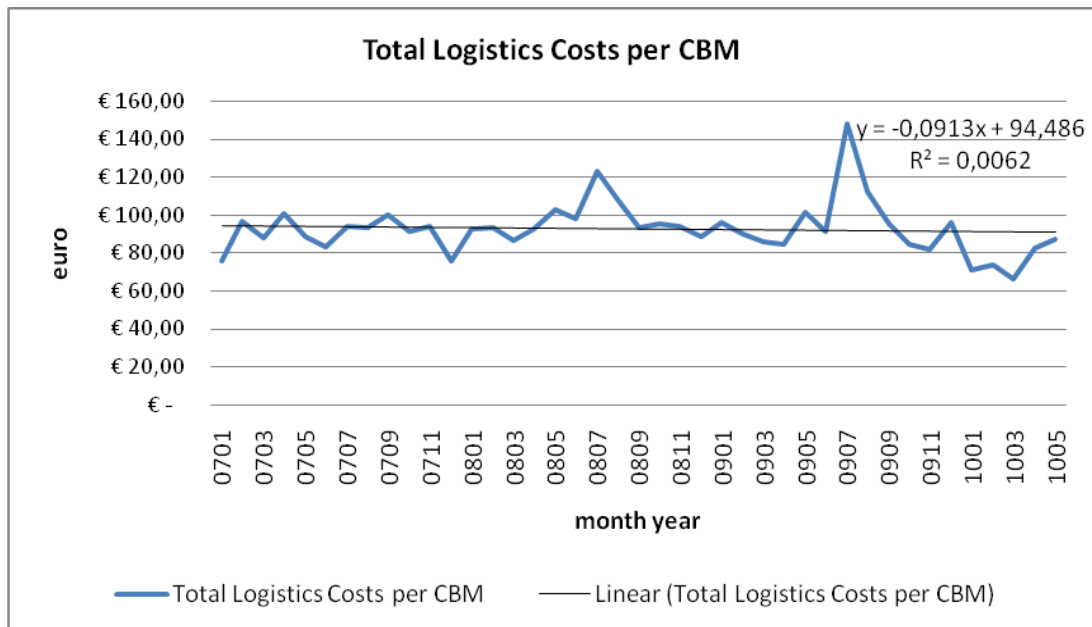


**Figure 6.2** handling volume trend

Finally we can make up the proper index as logistic cost per handling volume and describe the trends like Figure 6.3. then the trends are decreasing at the same period as following regression equation.

**The regression equation for logistic cost per volume :  $Y = -0.091X + 94.48$**

As a result, it show that the logistic cost per volume(CBM) has been decreased with this independent variable's triggering. Actually it shows that as much logistics cost as 9.1cent per CBM has been decreased from January 2007 to May 2010.



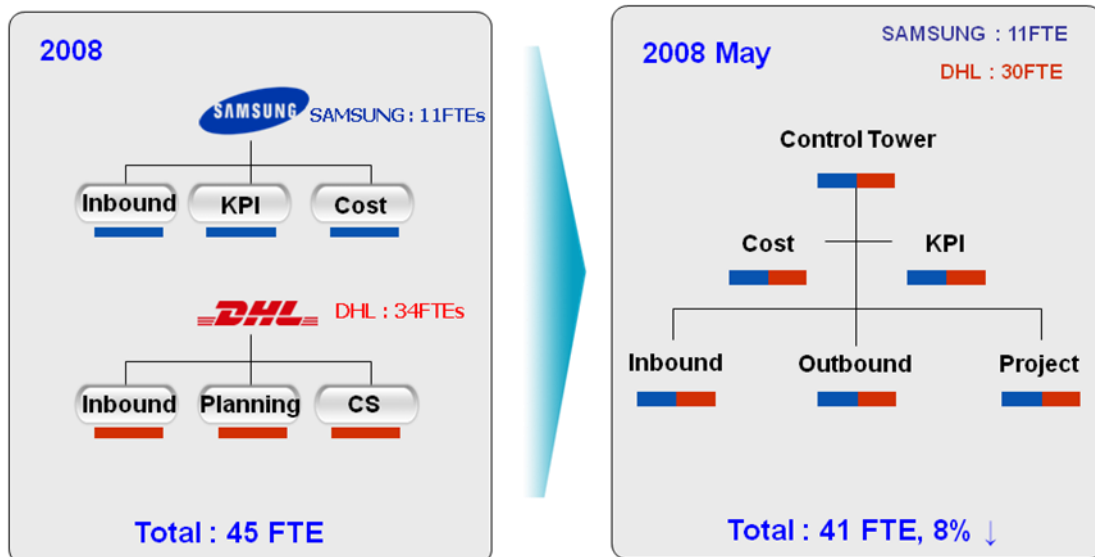
**Figure 6.3** logistic cost per volume trend

So this analysis is corresponding with the result of survey, so this is mutually explained to each other as the control tower project which is represented IT internalizations and virtual organization affect the logistics cost Saving.

## Q2. The Effect of organizations efficiency

The survey results tell control tower have affected positively as +1.44 with Confidence level 99% with regard to statistics methods, concurrently we have track back the changes of organizations from 2008 to 2010

Firstly, there were separate offices but providing the same functionality between Samsung(Client Company) and DHL (3PL) in terms of organization management like Figure 6.4. so there was some inefficiency for redundant job overlaps.

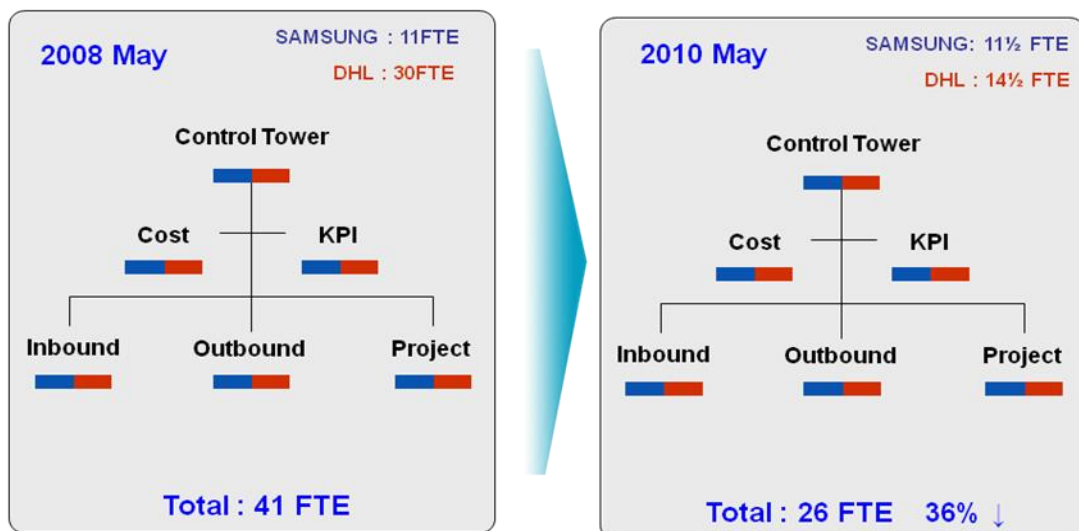


**Figure 6.4** Virtual organization set up (2008) FTE: full time employee

Since it has been merged into one virtual organization in the same office just pairing functionality to cooperate and communicate each other in May of 2008.

In this merge, there was some melting pot effect that the member of organization felt the challenges and synergy effects regardless of their background organizations.

At this stage it is more crucial to make most of merged organizations and settle down this merged organization quickly. So 8% is rather bigger decrease considering these points.



**Figure 6.5** Lean organization set up (2008~2010)

As time goes by in this virtual organization, there are abundant cross training and innovations to make further synergies inside of organizations. So management gradually restructured the organization by in-sourcing and automations by system.

So this period, almost 36% of FTE are decreased in terms of lean organization activity like figure 6.5 while this organization covers the same amount of job and area or even more.

But the management need to be cautious concerning the fatigue within the organizations in mid terms, plan the back up of each employee, and secure the operation point without lowering quality levels .

Anyhow apparently the organization efficiency is illustrated to be efficient as well as survey results as +1.44 points.

So this analysis is corresponding with the result of survey, so this is mutually explained as the control tower project which is represented IT internalizations and virtual organization affect the organization efficiency

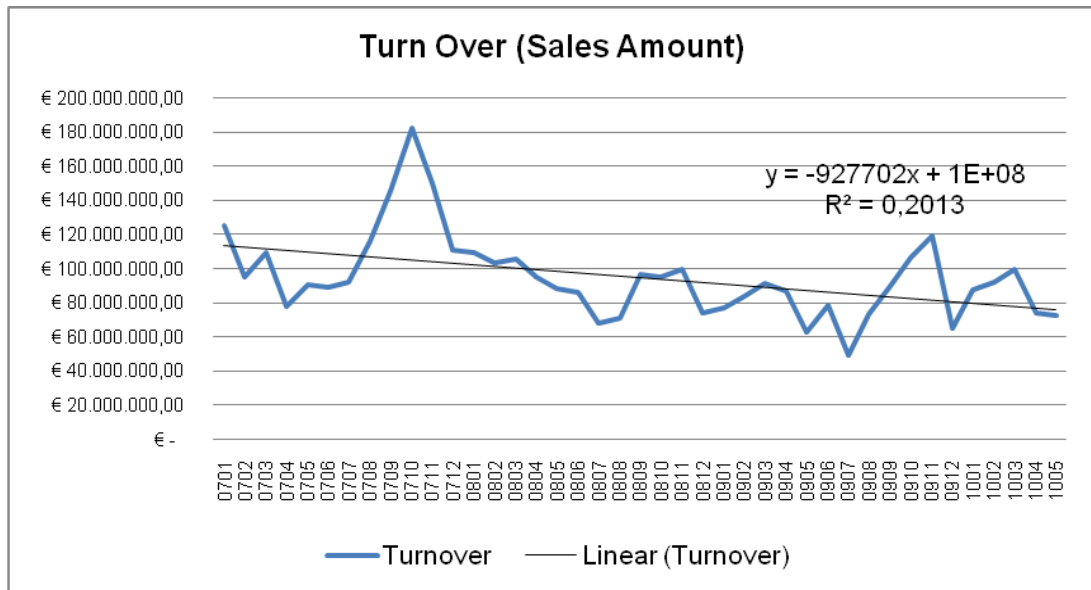
### **Q3. The Effect of financial flexibility**

The survey results tell control tower have affected positively as +0.56 with Confidence level 99% with regard to statistics methods, concurrently We have executed the data mining for logistics Cost ratio against total turn over in this period (Jan 2007~ May2010) which means that client company can have more room to manage price range to the market as a flexibility.

At first , we described the monthly sales price to the customer which is company turn over per month like Figure 6.6

It shows the total turn over are decreasing in this period.

**The liner regression of Logistic cost ratio:  $y = -92770x + 1E+08$**



**Figure 6.6** Turn over trend (Jan 2008~ May 2010)

In this amount, there is portion that is taken by Logistic Cost named as logistic cost ratio(%). If this is lower than other companies, the company can have more financial flexibility such as price driving promotions or marketing activity to enlarge overall turnover.

So we defined this ratio associated with the logistic cost trend like Fig 6.7. but this trend of logistic cost ratio seems like increasing in contradiction to the survey.

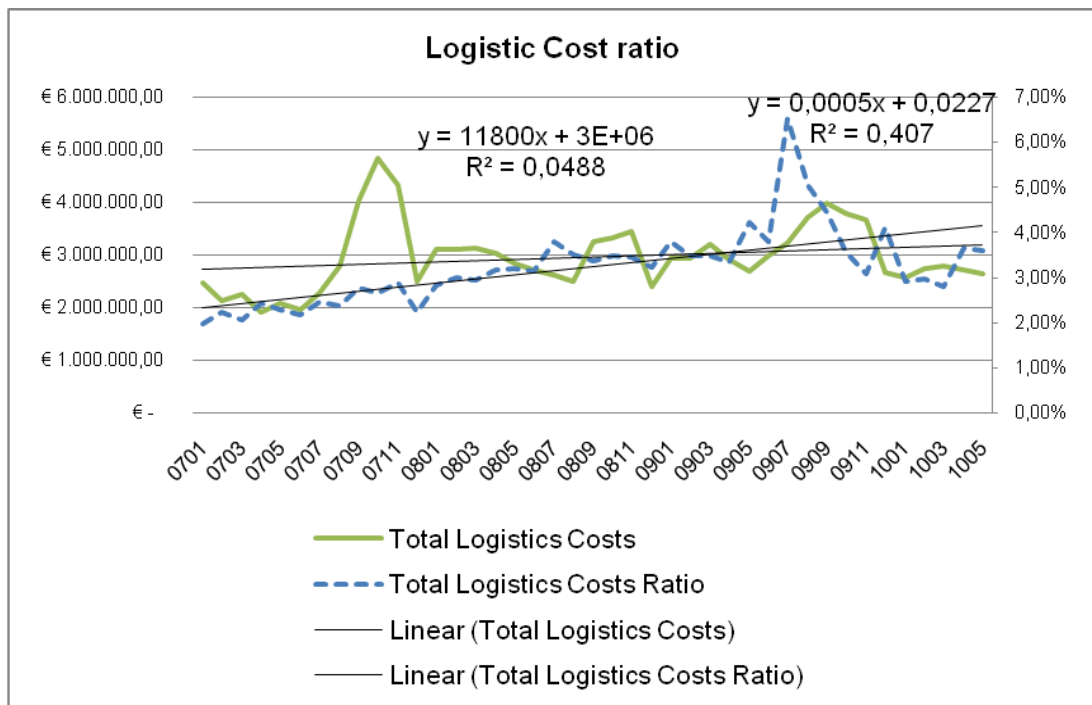
**The liner regression of Logistic cost ratio:  $y = 0.0005x + 0.0227$**

But there are some pitfalls to be considered such as sales amount per CBM , the logistics only care about handling volume not for sales amount that needs to be handled, but we can see the sales amount per CBM is decreasing substantially.

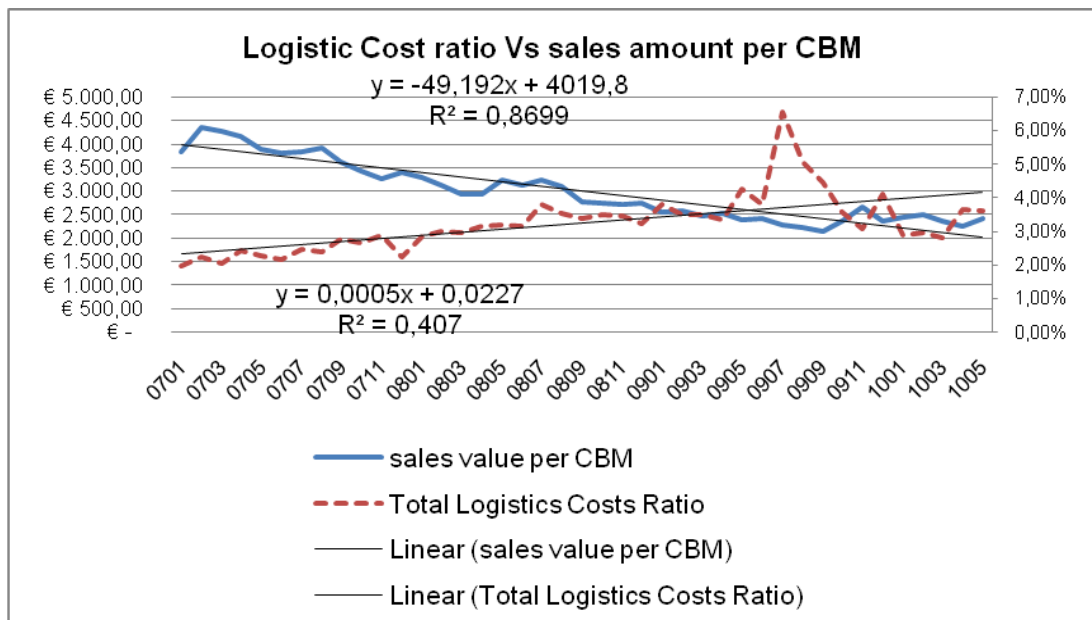
So even if the logistic cost per CBM is decreasing, the logistic cost ratio will not be decreasing easily because total sales amount are decreasing more than logistics cost decrease like Figure 6.8

**The liner regression of sales amount per CBM:  $y = -49.19x + 4019$**

So we cannot simply say this is contradiction to the fact that it affect the flexibility in positive way .



**Figure 6.7** Logistic Cost ratio trend (Jan 2008~ May 2010)

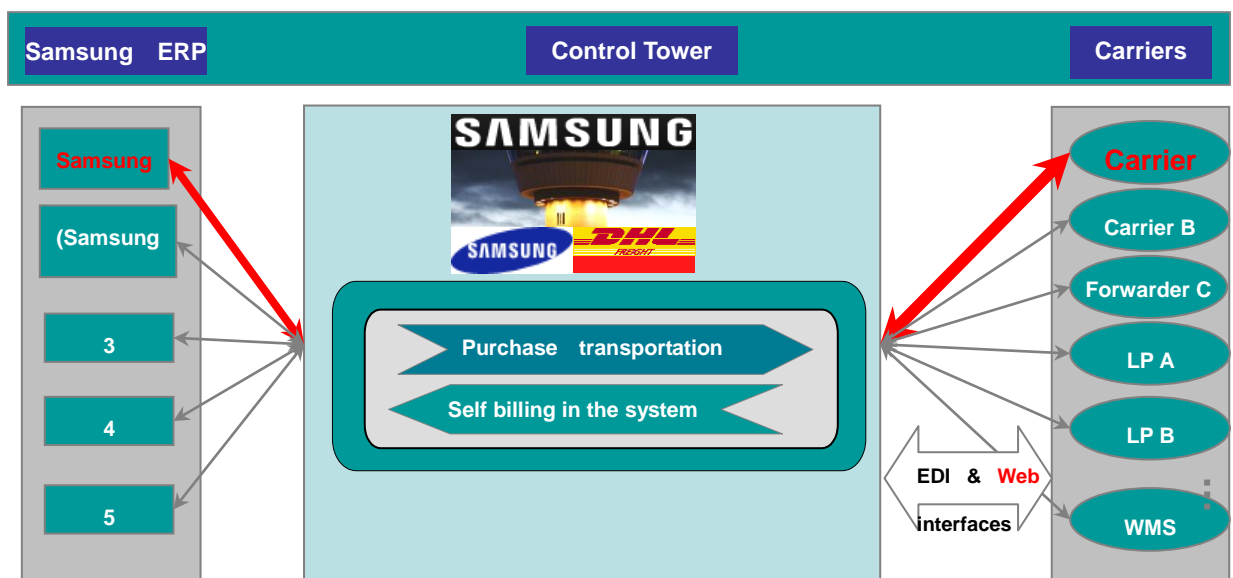


**Figure 6.8** Logistics Cost ratio vs Sales amount per CBM trends

#### Q4. The Effect of Cost visibility

The survey results tell control tower has affected positively as +1.17 with Confidence level 99% with regard to statistics methods, concurrently we will analysis this with proper examples in reality.

First of all, there is IT internalization with TMS and WMS, so this IT system can be developed with Samsung's own purpose. Previously these systems belonged to the 3PL so those cannot be optimized or amended only with Samsung's purpose. But after internalization, Samsung can use this as a Cost verification module with logistics partner such as each trucking company or warehouse operating company like Figure 6.9



**Figure 6.9** Cost validation usage for IT system(WMS/TMS)

As a matter of fact, Carriers previously sent the freight invoice without structural verification and often made errors giving a wrong invoice amount, so it took too much time to reconcile each other. But this auto Cost verification module in IT systems (TMS and WMS) enable both invoicing party get aligned with common Web tool.

Contracted tariffs are now registered in the IT system for each logistic activities in advance, so carriers can create their invoice according to tariff structures which is constantly updated and mutually agreed and monitored like Figure 6.9

As a result, the mutual party can communicate the invoice amount with clear agreement and alignment which is visibility.

The screenshot displays a software interface for managing logistics tariffs. It features a sidebar with a tree view containing categories like MEASUREMENTS, Order, REPORTS, and AMOUNTS. The main area shows a table of contracted tariffs. The 'AMOUNTS' section is currently active, showing a table with columns: Required Amt., Calc. base, Reported Amt., Curr., Calc. base Qty., Type, System Amt., and Curr. The table lists 'Warehouse Storage Costs' with a required amount of 425.83 EUR and a calculation base of 17.00 MTQ. Below this, there is a 'General Surcharge' entry. Buttons for 'accept', 'add', 'Save Changes', and 'Undo Changes' are located at the bottom of the interface.

**Figure 6.10** Various contracted tariff tables in the IT system.

So this analysis is corresponding with the result of survey, so this is mutually explained to each other as the control tower project which is represented IT internalizations and virtual organization affect the cost visibility improvement.

## Q5. The Effect of creative business development

The survey results tells that the control tower have affected positively as +0.88 with Confidence level 99% with regard to statistics methods, concurrently we will analysis this with exemplar project which tried to set up new logistic type.

Previously it has been very hard to design new creative business type without the flexibility of system support, but after internalizing the IT structural system, it is



definitely flexible to design new network with system support.

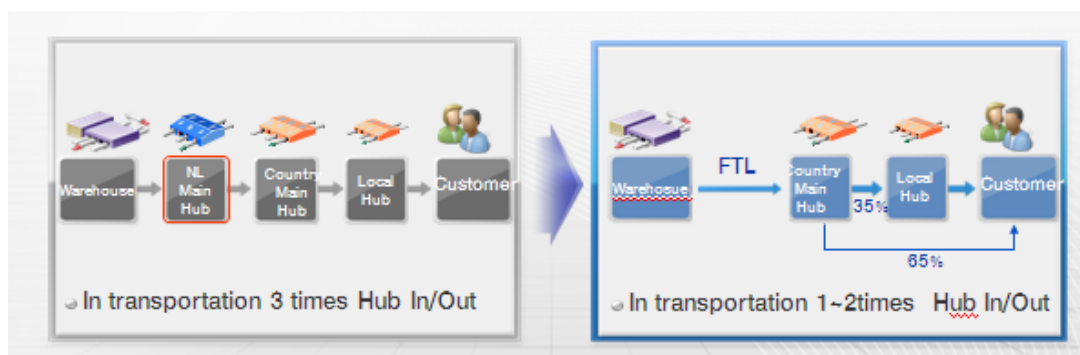
This system is not the asset of Samsung only, there are always limitations to think if this changes also might make the other business unit of 3PL which are using the same IT structures.

As soon as IT system internalizations are set up, logistic network development project are initiated by supports of IT system flexibility.

Then the idea was to decrease the loss from complex network service which usually went thru several steps of delivery depots handling. The satisfaction level of this commercial international network service from market governing carriers are not so high because of a low level of customer support and highly populated tariff .

To break through this limitation, business development projects were kicked off, then recruited local network service provider with competitive price and executed international cross docking service by own planning with full truck loading hiring from volume consolidations process in own TMS..

As a result, the network are simplified by arranging international cross docking as a new business model like Figure 6.11



**Figure 6.11** Changes from new business development in network

This gave cost saving as much as 1million euro per year in transportation Cost and improved the lead time up to 1.5 days.

Overall changes in this business development were able to be executed by support of IT availability and innovation driving spirit came from the virtual organization

If there are separated organizations in this set up then it couldn't be possible due

to the organizational wall between two organizations which is usually different characteristic and expertise.

As a result, this question indexes are also explained for each other between survey results and real project cases.

#### **Q6. The Effect of business restructure to current service**

The survey results tell control tower have affected positively as +1.20 with the Confidence level 99% in regard to statistics methods, concurrently we will verify this with exemplar project which tried to re engineering current network services.

As the client company used to get service from market governing service provider It is getting difficult to ask for restructuring in the business for improvement. But if there are proactive methods to restructure serviced products by itself, the possibility for innovation is going to be open more frequently.

In Europe, there are only a few carriers that have network covering the whole Europe completely. So the mobility to changes are scarcely captured from these carriers,

There is always very limited visibility for transport information like Figure 6.11



**Figure 6.12** re engineering the logistic service

But facilitating in-transit hub arrival and departure event from carrier's system into Internal TMS gave the client company innovative improvement like in Figure6.11. Every stake holder of this delivery can see where and when their interested goods are now in real time. This can be implemented by persuading the carriers to open this information externally or giving the initiative from client company side.

It might not happen without internal IT system and negotiation skill with carriers which also secured from 3PL expertise in control tower. All of this can not be realized if only one of them is not supportive of this project.

This restructuring process made the client company and carrier company become more innovative and have the ability to see always the possibility to improve. So this is another positive effect from the control tower implementations.

Both survey results and project example say control tower affect the business restructuring as positive way.

#### **Q7. The Effect of operation controllability**

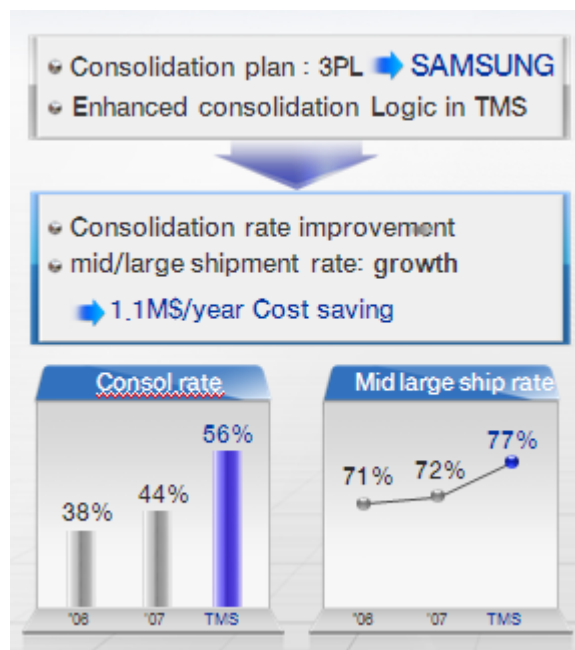
The survey results tell control tower have affected positively as +1.44 with the Confidence level 99% in regard to statistics methods, concurrently we will verify this

with exemplar process changes which shows how far the controllability progressed.

The most substantial logic to decrease transportation cost is to make the loading efficiency higher with each vehicle. This process was a manual job by intermediation of planner or operators, but if we do it in systemized way through IT system and involved this consolidation calculation, then client company can get the benefit from the efficiency of consolidations which is usually taken by the carrier company.

Previously even if carriers make highest level of consolidation by economy of scale from their other customers it is hardly transmitted into the client company because this consolidation has not been controlled by the client company and not visible to them, so only carrier itself can have the benefit form enhanced consolidation. This is because the client company usually uses the carrier's TMS instead of theirs, so no controllability to the usage of consolidation modules

But IT internalization( TMS and WMS) the client company can control from the order consolidation planning to Good issues by itself, and using the same office as a colleagues with planners is much helpful to get aligned within themselves. If needed affect the operations in short notice.



**Figure 6.13** benefit from operation controllability

So this operation controllability for shipment consolidation is improved via this control tower implementation. So the fill rate of the truck is increased to have lower unit transportation cost value of same volume. The consolidation ratio against individual delivery order has grown from 44% to 56% which is steeper curve than just annual growth from 39% to 44% and the usually efficiency shipment which can get volume discount due to enough volume more than 10 cubic meters has far more improved from 71% to 77% after control tower projects compared with annual growth from 71% to 72% like Figure 6.12.

This accelerated improvement illustrates this, the IT system affect the operational controllability which is one of logistics business success factors.

As a result we can find the self evidenced improvement as well as the survey's results.in a previous chapter.

#### **Q8. The Effect of Communication fluency**

The survey results tell control tower have affected positively as +1.10 with the Confidence level 99% in regard to statistics methods, concurrently We will verify this with exemplar process changes which shows how far the communication are improved in various prospective..

We can tell there are various communications that have to be secured in Logistics operations with each stake holders, but in non systemized way of communication, made this more confused or limited to each other.

So there are many misunderstandings that made an operational loss due to these communication issues. But this was fixed by systemized communications like the Figure 6.13.

First, the most demanding communication with carriers is planning part for equipment, this should be aligned with mutual agreement and posted out in common place.

Second is communication with customer, this is very important to overwrite the previous requested delivery date from order. In this case the system always has to keep all history to be communicated in agreements.

Third the warehouse usually execute from the picking to ready to dispatch. In this

case also it should be as fast as it can, otherwise warehouse process might be delayed seriously.

Fourth, another department which initiated this delivery is the Sales department. Usually they are the contact for customer directly so they need to know every detail to respond their customer quickly and detailed.

Fifth , even internal communication between planners is important due to the possibility to hand over this shipment to another planners, in this case every standardized event that explains the exceptions should be registered and shared in the common IT systems, so it was improved like Table 6.1 before and after column.

From	to	purpose	method before	Method after
Control tower	Carrier	planning confirm	Fax, phone call	Formatted mail
Control tower	Customer	Appointment	Fax, phone call	Formatted mail
Control tower	Warehouse	Dock Slot assignment	One direction Instruction	Shared planning module
Control tower	Sales Dept.	Delivery progress	Shared in limited screening	Shared in same TMS screen
Control tower	Customer	Exception mgt.	Not registered as a standard event	Shared by registration

**Table 6.1** communication fluency

## **Q9. The Effect of independency to service provider**

The survey results tell control tower have affected positively as +1.00 with the 99% Confidence level in regard to statistics methods, concurrently We will verify this with exemplar changes which shows how far the independency to 3PL are improved

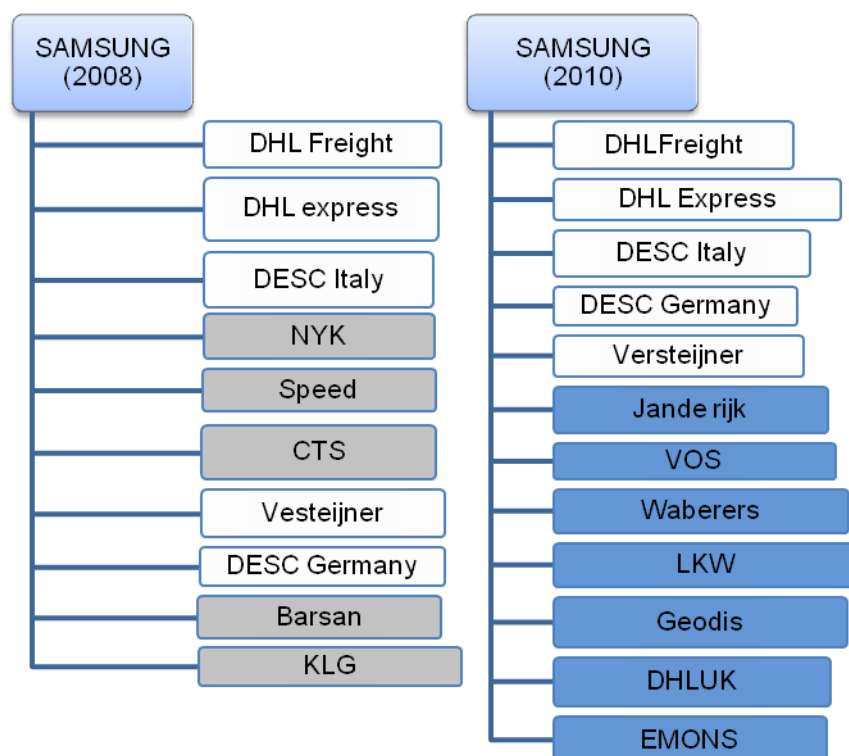
Originally Samsung have used the turn key based carrier contract with the sole party, then Samsung had no direct relationship with each carrier.

So even if each carrier issue is escalated in to correct person, it is very hard to change the actual carriers, it means that Samsung are without the controllability of carriers.

But after we implement In house TMS and virtual location with contract expertise,

Samsung can freely change carriers by RFQ with requirement.

In figure 6.14, there is comparison between contracted carriers in 2008 and 2010. The carriers colored in both Tree in figure 6.14 shows the changes of contracted carriers. Those have been terminated in 2008 and newly replenished in 2010 with regards to New RFQ



**Figure 6.14** Carrier contracted with Samsung

In Figure 6.14, we can see around 50% of carrier has been terminated and again 7 carriers, more than 50% of carrier are contracted as a service providers. So it means that Service provider dependency are overcome by control tower project as same as the survey results.

#### Q10. The Effect of Logistics performance

The survey results tell control tower have affected positively as +1.32 with Confidence level 99% with regard to statistics methods, concurrently we will analysis this with data mining from the KPI system.

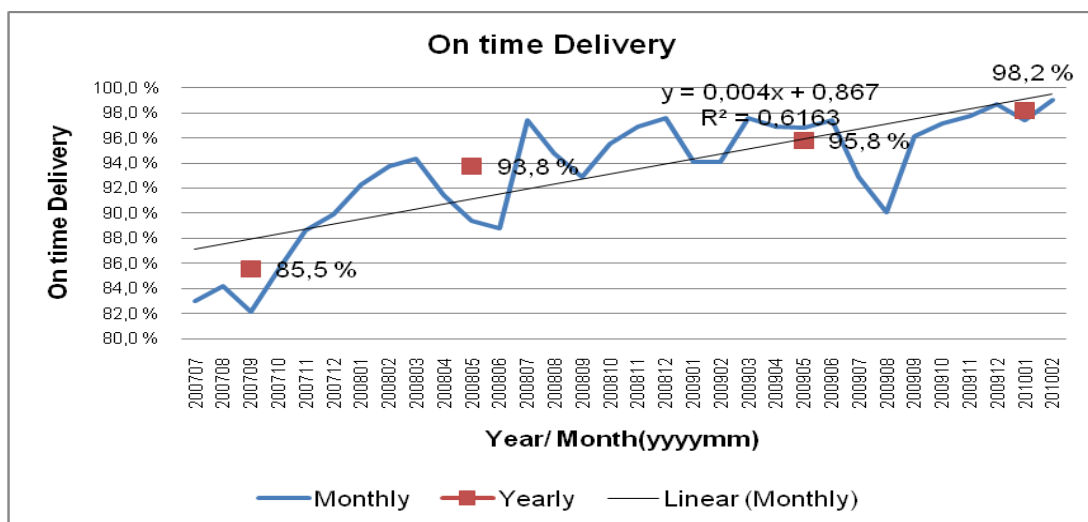
When we consider the logistics performance, this is divided as two part ,one of them is Transportation part and the other one is warehouse part, each part is mostly measuring their performance in table 6.2

Category	Performance index	description
Transportation	On Time delivery	ATA(Actual Time to arrival)<=ETA(Estimated!)
	On time IOD Receipt	IOD Receipt date- IOD date<=2
Warehouse	On Time GI	Planned GI date - Actual GI date<=1
	On Time GR	Actual GI date<= Planned GR date

**Table 6.2** Logistics performance index

In Transportation, it is important for Carriers to meet their commitment for delivery date which is maintenance with contracted lead time. So the % of shipment count which successfully reach their agreements are named as on time delivery Index.

When we examine the trend of this Index, it shows the graph with the linear regression like fig 6.15



**Figure 6.15** monthly on Time delivery trend

#### The liner regression of On Time delivery KPI : $y = 0.004x + 0.867$

So we can see this Logistic performance index are improving in terms of positive slope such as +0.004 .

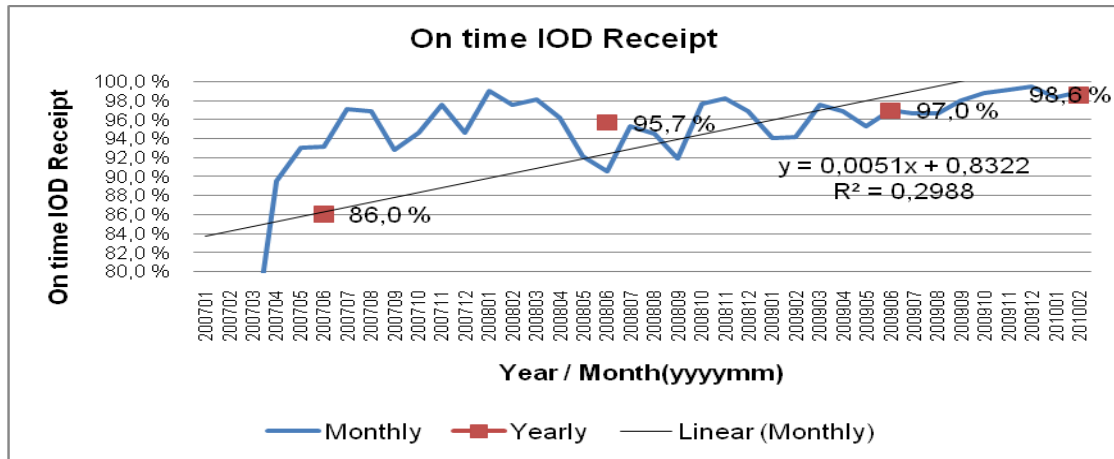
To get the delivery information from Carrier in a timely manner (mostly within in 2 days), we used to measure the response speed so the response to delivery information need to be sent within 2 days from the delivery. It is major transportation performance index because nowadays most of company make customer invoice with respect to the date when delivery information received.

So the contracts with carriers are including this clause as the carriers needs to



inform the delivery information within 2 days from the delivery date.

When we examine the trend of this Index, it shows the graph with the linear regression like fig 6.16



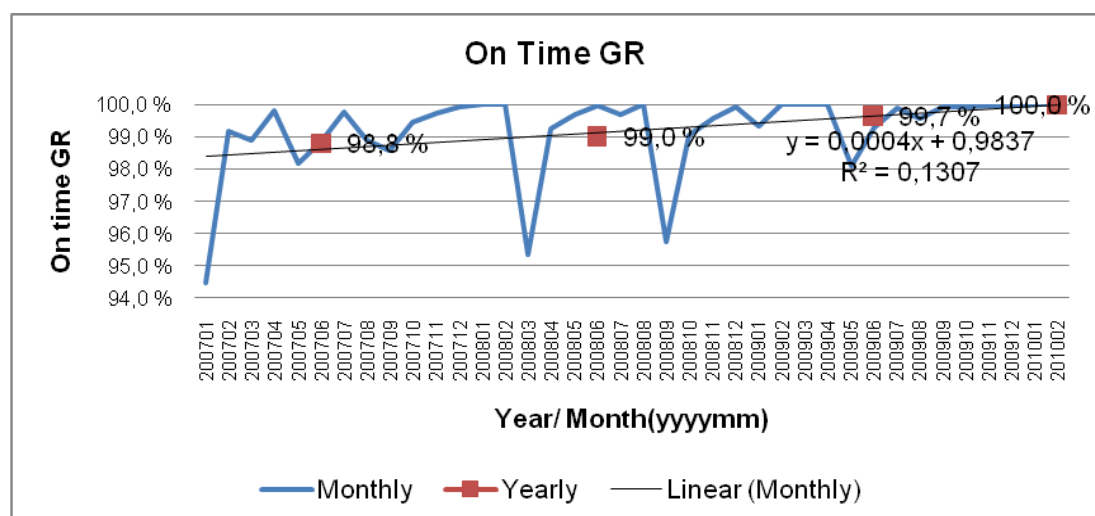
**Figure 6.16** monthly on Time IOD receipt trend

**The liner regression of On Time delivery KPI :  $y = 0.0051x + 0.832$**

So we can see this Logistic performance index are improving in terms of positive slope such as +0.0051

In the warehouse, the performance which is related with timely goods handling through the warehouse is important. Otherwise the Stock availability will be decreased then the stock day is going to be extended due to bad liquidity.

When we examine the trend of this Index, it shows the graph with the linear regression like fig 6.16



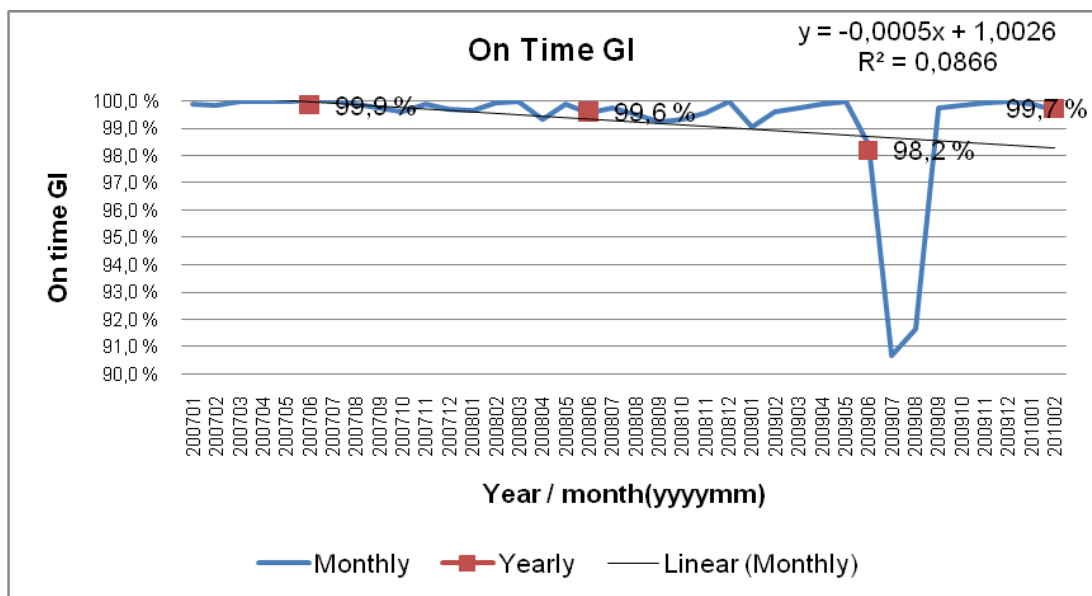
**Figure 6.17** monthly On Time GR trend

**The liner regression of On Time delivery KPI :  $y = 0.0004x + 0.983$**

So we can see this Logistic performance index are improving in terms of positive slope such as +0.0004

So for outbound warehouse procedure should be as fast as agreed to make timely good issue activity in warehouse. This is very important because it directly influence the starting point of delivery

When we examine the trend of this Index, it shows the graph with the linear regression like fig 6.18



**Figure 6.18** monthly on Time GI trend

**The liner regression of On Time delivery KPI :  $y = -0.0005x + 1.002$**

So we can see this Logistic performance index are slightly regressed in terms of negative slope such as -0.0005. but it can be explained that every moment when the new IT system are implemented the warehouse operation for out bound might be affected in negative way until every floor worker get accustomed with new way of works.

As a result, main KPI for Logistics operation are all steeply improved in this period. It is mainly because there is development for transit visibility, so Control tower can see every in-transit status more detailed and timely and Carriers can be instructed

more proactively and respond very quickly.

So the analysis is telling us that the survey result are not far from the reality but deserve to have that concepts for logistic performance.

### 6.3 Analysis Results summary

In chapter 5, the 10 measurement factors are interpreted as positive changes with 99% credential level. Next to it, we have compared it with data mining and exampling to verify that previous survey results are substantiated.

As a result, all 10 index are corresponded with survey results like table 6.3

<i>index</i>	<i>Index concepts</i>	<i>Survey result</i>	<i>Data mining</i>	<i>Example prove</i>
<b>Q1</b>	<b>Cost efficiency</b>	<b>1.00</b>	<b>Cost per volume decrease</b>	
<b>Q2</b>	<b>Organization efficiency</b>	<b>1.44</b>	<b>Headcount decrease 36%</b>	
<b>Q3</b>	<b>Financial flexibility</b>	<b>0.56</b>	<b>Logistic Cost ratio decrease</b>	
<b>Q4</b>	<b>Cost Visibility</b>	<b>1.17</b>		<b>Auto cost verification</b>
<b>Q5</b>	<b>Business Development</b>	<b>0.88</b>		<b>International x docking set up</b>
<b>Q6</b>	<b>Restructuring Availability</b>	<b>1.20</b>		<b>Hub visibility improving</b>
<b>Q7</b>	<b>Operation Controllability</b>	<b>1.44</b>		<b>Consolidation rate increase</b>
<b>Q8</b>	<b>Communications fluency</b>	<b>1.10</b>		<b>Communication module in IT</b>
<b>Q9</b>	<b>Independency of provider</b>	<b>1.00</b>		<b>50% of Carrier changes</b>
<b>Q10</b>	<b>Logistics performance</b>	<b>1.32</b>		<b>4KPIs increased</b>

**Table 6.3** analysis comparison for question 1~10.

## **Chapter 7 Conclusion**

### **7.1 contribution**

This research is mainly describing the mid term innovation within the specific Samsung – DHL Freight environment. It depends, of course, on the specific business surroundings, to apply this conclusion to other practical business units. Especially it is limited to apply the conclusions made to other industries other than consumer electronics. Also it is highly based on the empirical method to extract the conclusion of this research and experiment groups are not perfectly restricted from other possible independent variables as a weak point.

To avoid any biased conclusion, we used screening type questions in terms of interested party sampling collection. But it also has some limitation to have a small survey group due to constrained project involvement sampling group.

This research simply started from the hypothesis to challenge opinions focusing on the weak point of 3PL business, after all which is mainly based on business consulting. This research is a kind of verification to the hypothesis from that advice from the consulting world. It took 3 years to see the real results and structural changes from the driving change factor which is the independent variables.

We found nothing to reject this hypothesis that IT Internalizing and Virtual organization set up is the success factor of 3PL business implementation in terms of methodologies as the survey and data mining and example case studies.

So we can verify that the independent variables affected the 10 dependent variables which mean success of 3PL business in various point of views.

The analysis result was proven as a positive effect associated with the survey results, the data mining and the plausible examples.

So we can say the IT internalization and virtual organization were definitely a large part of the success factor for 3PL business in this business case.

It also can be explained by logical thinking that the IT system is a critical compulsory method to improve the controllability which might be jeopardized by most 3PL business at the end to perform innovation project continuously in 3PL type of business surrounding. This means who would/will retain the leading role for innovations in that kind of business set up is crucial, otherwise the business control is lost to the client company..

Most companies who complained of lower outcome than expectation it is mainly related with human related dissatisfaction to 3PL business solutions. In other words, the daily communication problem between 3PL employee and client company employee is the main hindrance to get the expertise advantage from the 3PL company. Such can be the frustration of 3PL company employees due to personal relations from the beginning. It can be a very positive achievement by organization integration into one office surrounding. To work together without concept of previous business units is definitely helpful for cooperative working atmosphere and focusing on more innovation. This organizational solidarity set up is even more helpful than just financial cost savings from head count decrease. This valuable kind of employee's positive mind set up is something hard to measure but that cannot be bought .In other words, one single idea for cost saving from well organized 3PL business unit might be more valuable and make more financial impact than simple head count reduction.

## **7.2 Practical Implication**

to apply this solution to other business units, companies should be careful to have the correct methodology to implement in terms of human resource management and IT project management, that is one of the pitfalls to make the benefit from this solutions, without proper implementation, this business case just shows theoretical benefit..

As for IT implementation, it is very important as other IT project management, to manage the project with the close involvement of Operations. Without such an involvement, the in-sourced IT logistic framework, can be worse than outsourced IT framework which was provided in the original 3PL service. Because IT set up is directly resulting in operational affect , especially WMS is difficult to adopt part by part or roll back due to characteristic of the business package. For this reason the

operation should be substantially involved with IT implementation as from functionality design stage. Failing this the operation who should adapt themselves to a new system will definitely experience severe problems resulting in a lower operational performance. This is very risky because both TMS and WMS are IT main infra system which are heavily involved with operation or business success itself let alone business efficiency.

As for Virtual organizations, this is a very sensitive project which is related with human nature especially in initiative management so if this is not handled with consideration to the respect of employee's understanding and accepting these changes. It might result in organizational collapse. It needs to be carefully designed by human resource specialist from the first stage and employee relationship management is one of the pre-requisite factors for this kind of heterogeneous organization's integrations. So the relationship between two organization has to be achieved based on mutual belief and respect otherwise no great idea or initiative can be realized by the persons who are really supposed to perform due to lack of motivation.

### **7.3 Future research**

It has been often questioned which one between IT and organization are more influential in the positive changes for 3PL business success. Since I began my research I could not decide between IT and organization or even make a comparison between them. This is due to there being very short timeframes between two changes in experimental cases to check the influence.

So if allowed, it is meaningful to investigate the differences between the changes, because some companies which are not favourable to change have to select between either IT or organizational changes at the end.

Now I believe that these two types of evolvement against the original 3PL concept are valuable and proved to be successful factor if properly implemented. But one step further it deserves to investigate the multicollinearity between IT internalization factor and Virtual organization factor for selection or balancing while the practical purpose in industry.

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## **Survey Question sample**

Dear Sir.

This is Samsung-DHL Control Tower organization which provides Logistic service to you.

I would like to get some feed back for Control Tower (WEDC).

We have implemented control tower project as of July 2008 and the main changing factors of control tower are to

internalize IT solutions(TMS and WMS)and to set up virtual organization between Samsung and DHL.

Considering this factors, Please answer the questions about the changes in your point of view.

Your answer will be used only for research purpose with confidential(anonymous).

After considering the status before and after Control tower Implementation (2007) , please mark your points about the effects of Control tower  
-3(strongest negative) to 3(strongest Positive) as well as 0 (negligible changes)

1. How do you think the control tower project gets the benefit of Logistics Cost due to economy of scale and scope?
2. How do you think the control tower project influenced the efficiency of organizations?
3. How do you think the control tower project influence the company can get flexible finance structures?
4. How do you think the control tower project makes the Logistics Cost visibility improved ?
5. How Do you think the control tower project gave the easiness to extend new service area or business?



6. How do you think the control tower project gave more opportunity to restructuring the Logistics service network ?

7. How do you think the control tower project gave more controllability to logistics operations?

8. How do you think the control tower project improved the communications between service providers and shippers ?

9. How do you think the control tower project gave Samsung the independency to Service providers

10. How do you think Logistic performance such as Ontime delivery or On time Good Issues are improved? Bythe control tower Projects

Please reflect your information to answer this questions

**1. what is your company type?□□**

- ☐ ☐ ☐ DHL Freight(Control tower)
- ☐ ☐ ☐ SAMSUNG(Control tower)
- ☐ ☐ ☐ DSC(Warehouse operator)
- ☐ ☐ ☐ SAMSUNG(Out of Control tower)
- ☐ ☐ ☐ Customer Company(consignee)

**2. what is your job function?**

- ☐ ☐ ☐ Operations
- ☐ ☐ ☐ Finance
- ☐ ☐ ☐ IT(Innovation)
- ☐ ☐ ☐ Planning(Strategy)
- ☐ ☐ ☐ Management

**3. How many years have you experienced the Control tower projects□□**

- ☐ ☐ ☐ no direct experiences
- ☐ ☐ ☐ below 6 months
- ☐ ☐ ☐ below 1 year
- ☐ ☐ ☐ below 2 years

☐ ☐ ☐ over 3 years

**4. What do you think about the meaningful triggering changes by the Control tower projects**

- ☐ ☐ ☐ IT system implementations(TMS/WMS)
- ☐ ☐ ☐ Organization integrations(SAMSUNG-DHL)
- ☐ ☐ ☐ Both IT and Org changes
- ☐ ☐ ☐ Other (please specify)

**5. If you have to select one among Cost efficiency and Service level of Logistics, which one do you prefer in your point of view.**

- ☐ ☐ ☐ Logistics Cost Efficiency
- ☐ ☐ ☐ Logistics Service level