CHAPTER IV
DATA ANALYSIS AND RESULTS OF THE STUDY

This chapter discusses and presents the results of the survey population in terns of general characteristics of populations along with the results of the statistical analysis for each reseach queation.

4.1 Characteristics of the respondents

This section presents the general characteristics of the respondents surveyed. The characteristics of the respondents consist of three parts: the general demographic characteristics of respondents, the general characteristic of the vessels and the characteristics of the ERP shipping system utilization.

4.1.1 The general demographic of the respondents

The general demographic of the respondents are summarized in Table 3. These include gender, age and current position. In this table, the majority of the ERP users are female, 61.9 percent of the respondent. This statistic shows that woman is more involved in work that related with ERP shipping system than men. Half of the respondents ages range from 31-40 years and 28.2 percent of the respondents are between 21-30 years.

The level of the current position of the respondents in the shipping industries are classified into 4 groups, considering of executive level, middle management level, supervisor level and staff level. The highest proportion of respondents (73.3 percent) is staff level, and 20.1 percent of the respondents are middle management level.

Table 3 Demographic Characteristics of the respondents (273 Questionnaires)

Characteristic	Frequency	Percent
Gender		
Male	104	38.1
Female	169	61.9
Total	273	100

Characteristic	Frequency	Percent
Age		
Less than 21 years	0	0
21-30 years	77	28.2
31-40 years	139	50.9
More than 41 years	57	20.9
Total	273	100
Current position		
Executive	18	6.6
Middle management	55	20.1
Supervisor	0	0
Staff	200	73.7
Total	273	100

4.1.2 The general characteristic of the vessels

The general characteristic of the vessels are presented in Table 4. This includes number of the vessels and type of the vessels. Most, 91.6 percent of the number of vessel in their respondents' organization is between 30-45 vessels. Half of the vessels are small handy type and 33 percent of the vessels are handymax type.

Table 4 Characteristic of the vessel in their respondents' organization

Characteristic	Frequency	Percent
Number of the vessel		
1-15 vessels	0	0
15-30 vessels	0	0
31-45 vessels	250	91.6
More than 46 vessels	23	8.4
Total	273	100
Type of the vessel		
Small handy	161	59
Handymax	90	33
Super handymax	9	3.2
Containers	13	4.8
Oil Tanker	0	0
Total	273	273

4.1.3 The characteristics of the ERP shipping system utilization

The characteristics of the ERP shipping system utilization of the respondents are presented in Table 5. The table illuminates the specific characteristics of the respondents in term of ERP shipping system usage experience, ERP knowledge and ERP involvement. Additionally, frequency of brand and application or modules of ERP shipping system that are being used by the respondents are displayed in Table 6.

Table 5 Characteristics of ERP shipping system Utilization of the Respondents

Characteristic	Frequency	Percent
ERP shipping system knowledge		
None	25	9.1
Little	62	22.7
Fair	122	44.7
Much	51	18.7
Most	13	4.8
Total	273	100
ERP shipping system usage experience		
Less than 0.5 year	39	14.3
0.5-1 year	56	20.5
1-2 years	57	20.9
More than 2 years	121	44.3
Total	273	100
ERP shipping system Involvement		
ERP support personnel	10	3.7
ERP user	212	77.6
Management	26	9.5
Others	25	9.2
Total	273	100

From the Table 5, the majority (44.7 percent) of the respondents has fairly good knowledge of the ERP shipping system and 18.7 percent know ERP shipping system quite well. In inclusion, nearly 70 percent of the respondents have fairly good knowledge of ERP shipping system characteristic. Therefore, it can be summarized

that with such knowledgeable respondents, the data collecting from the survey can be justified in term of its construct validity.

Next, 44.3 percent of the respondents have an experience in ERP shipping system to support their work more than 2 years, and 20.9 percent of respondents have an experience 1-2 years. Additionally, Table 5 shows that 77.7 percent of the respondents are ERP shipping system users, while 9.5 percent of the respondents are management.

Table 6 Brands and applications or modules of ERP shipping system utilization by respondents

Brand of ERP shipping system	Frequency
Danaos	154
Shipnet	9
BASS	17
IBM	5
Others: NS5, ABS	88
Application or Module of ERP shipping system	**Frequency**
Crewing	88
Accounting/Payment	112
Purchasing	127
Database Administration	30
Income & Expenses	29
International Safety Management (ISM)	46
Voyage Estimate	29
Inventory Control	41
Risk Assessment	14
Operation	80
Hull Maintenance/Dry docking	65
Others	12

Table 6 depicts the descriptive statistics of the brand and application or modules of ERP shipping system utilized by the respondents. 56.4 percent of the respondents used Danaos system brand name, while 32.2 percent of the respondents used others which are NS5 and ABS brand name. Generally, ERP shipping system consists of 11 significant applications or modules: crewing, accounting/payment,

purchasing, database administration, income & expenses, international safety management (ISM), voyage estimate, inventory control, risk assessment, operation, hull maintenance/dry docking and others. From the survey data, it can be seen that the respondents used more than one application or module to support their work. The purchasing and accounting/payment module was used by a majority of the respondents (127 out of 273 respondents and 112 out of respondents). This statistic illustration suggests that the purchasing and the accounting module are the core and significant modules which plays a major role in the shipping industry.

The crewing module was the third module also used by many respondents (88 out of 273 respondents). The operation , hull maintenance and ISM module was and important module in the shipping industry, fundamentally, in the shipping industry which implemented ERP.

4.2 Data analysis and results of the study

In order to investigate the impact and relationship of factor in the ERP shipping system adoption and to test the hypotheses, we employed ordinary least squares (OLS) to analyze this research. Accordingly, path analysis based on regression was applied a more useful graphic of relationships among several variables. The results in each path analysis are concluded and explained in the following sections.

4.2.1 Perceived long-term consequences

Regarding to the reviewed literature, maritime organization factors will have a direct and positive relationship with the perceived long-term consequence. From Table 7 it can be seen that the regression result indicate that perceived long-term consequence is not positively and not significantly influenced by maritime organization factor (beta coefficient = -0.041). Therefore, the hypothesis of maritime organization faction will have a positive relation with perceived long-term consequences was reject.

Table 7 Regression Results: Perceived Long-term consequences

Variable	B	t	Sig. t
Organization	-.041	-.673	.502
R= .041, R^2= .002, SEE= 1.003, F= .453 Sig. of F= .502			

The non-existence of the direct influence of maritime organization on perceived long-term consequences can be explained by considering maritime organization factor cannot increase the level of flexibility in changing job or increase in opportunities of having a better or more meaningful work.

4.2.2 Perceived near-term consequences

The conceptual framework of this study illustrates that maritime technical factor, maritime individual factor, maritime regulation factor and perceived ease of use directly impact perceived near-term consequences. The results from multiple regression, which is a tool for path analysis indicated that perceived near-term consequences ware positively and directly influenced by maritime technical factor (beta coefficient = 0.184), maritime individual factor (beta coefficient = 0.189), maritime regulation (beta coefficient = 0.205) and perceived ease of use (beta coefficient = 0.126). The output of the multiple regressions is illustrated in Table 8.

Table 8 Regression Results: Perceived Near-term consequences

Variable	B	t	Sig. t
Technical	.184	2.988	.003
Individual	.189	3.036	.003
Regulation	.205	3.617	.000
Ease of Use	.126	2.232	.026
R= .482 , R^2= .233 , SEE= .884 , F= 20.224 Sig. of F= .000			

The regression result from Table 8 indicate that maritime technical factors, maritime individual factor, maritime regulation factor and perceived ease of use account for 23 percent variation in individuals' perception of near-term consequences.

Maritime regulation factor has a major impact on perceived near-term consequences. Maritime regulation factors strongly affected the perceived near-term consequences. A regulation and module for rules compliance were designed in a manner of being of capable the intelligent and interoperable functioning if shipping actors represents a feasible solution. The greater degree of feasibility in issuing shipping regulation increased the higher level of perceived benefit of ERP shipping system became.

Maritime individual factors were also found significant effect on perceive near-term consequences. Users realized that ERP shipping system was used as tools for reducing uncertainty among the users with their structured business process. ERP training provided the pass along mechanism that allows users of the ERP system to explore the system both from a technical standpoint and from a functional perspective and to be easy in learning how to use software.

In addition, the statistical results suggest that the extend to which technology functionality match technical characteristics significantly influences how well an perceived near-term consequences of ERP shipping system. Maritime technical factor, which is comprised of the IT integration, network communication, system compatibility and quality of data, has impact on perceived near-term.

Finally, perceived ease of use has the lowest degree of influence on the extent of perceived near-term consequences. Nevertheless, there is a positive relationship between perceive ease of use and perceived near-term consequences. The level of effort is a finite resource that a person may allocate to the various activities for which he/she is responsible and have effect on perceived near-term consequences.

To conclude, the empirical evidence from the statistical analysis indicates that perceived near-term consequences are influenced by maritime regulation factor, maritime individual factor, maritime technical factor and perceived ease of use.

4.2.3 Perceived ease of use

The result from the statistical analysis show that perceived ease of use is positively and significantly influenced by maritime technical factor (beta coefficient = 0.178) and maritime individual factor (beta coefficient = 0.193). The output of the multiple regression analysis is illustrated in Table 9.

Table 9 Regression Results: Perceived Ease of use

Variable	B	t	Sig. t
Technical	.178	2.740	.007
Individual	.193	2.977	.003
R= .316, R^2= .100 , SEE= .952 , F= 14.895 Sig. of F= .000			

From Table 9, it can be seen that a total of 10 percent of variation in perceived ease of use of ERP shipping system can be explained by variation in maritime

technical factors and maritime individual factors. There is a positive relationship of maritime technical factors and maritime individual factors to perceived ease of use.

Between the two variables (maritime technical factor and maritime individual factor), maritime individual factors have a higher degree of influence on the perceived ease of use than maritime technical factor. The relationship between maritime individual factors and perceived ease of use is quite obvious. The high of maritime individual factors; computer-self efficacy, uncertainty avoidance and ERP training, will perceived ERP shipping system to be easy to use, learn and understand due to the effect of computer self-efficacy and training on the degree of effort.

The result of the statistical analysis also revealed that maritime technical factor directly influences perceived ease of use. Maritime technical factors are the interaction of technical requirements and the functionality of the information technology. Therefore, maritime technical factors assist users in performing his or her portfolio of tasks. The greater of the alignment between technical and information system of ERP shipping system would be the greater of the ERP shipping system understanding and the more ease of learning and use will be.

4.2.4 Intention to use

The conceptual frameworks of this study illustrates that maritime organization factor, perceive near-terms consequences, perceived long-term consequences, perceived ease of use and perceived cost impact intention to use. The results from the statistical analysis show that intention to use ERP shipping system is positively and significantly influenced by maritime organization factor (beta coefficient = 0.242), perceived near-term consequence (beta coefficient = 0.258). The findings also indicate that perceived long-term consequences (beta coefficient = -0.014), perceived ease of use (beta coefficient = 0.007) and perceived cost (beta coefficient = 0.079) did not directly affect intention to use ERP shipping system. The output of the analysis is illustrated in the Table 10.

Table 10 Regression Results: Intention to use

Variable	B	t	Sig. t
Organization	.242	4.108	.000
Near-term	.258	4.343	.000
Long-term	-.014	-.244	.808

Ease of use	.007	.126	.900
Perceived cost	.079	1.374	.171
R= .403 , R^2= .163, SEE= .923, F= 10.252 Sig. of F= 0.000			

The regression results from Table 10 suggest that the 16 percent of the intention to use ERP shipping system variance was significantly explained by maritime organization factor and perceived near-term consequences. From the statistical analysis, perceived near-term consequences was significantly more strongly linked to intention to use ERP shipping system than maritime organization. The prominence of perceived near-term consequences males sense conceptually; a positive intention to use an application primary because of the functions it performs for them. An individual believes that using the ERP shipping system can enhance the performance of his/her job, decreasing time for job responsibilities, increasing the quality of product and increasing the quantity of output. Therefore, perceived near-term consequences should not be ignored by those attempting to adopt an ERP shipping system.

In addition, maritime individual factors were also found significant effect on intention to use ERP shipping system. This finding suggests that the users are susceptible to social pressure exerted by their colleague and superiors. Therefore, intention to use ERP shipping system requires cooperation amongst different parties and departments. Also top management may exert pressure on their employee to use the system. A strong and committed leadership and support from senior management is a necessary condition for ERP shipping system adoption.

Finally, perceived long-term consequences, perceived ease of use and perceived cost are found no direct influence on the intention to use. Perceived cost did not have a significant effect on the intention to use ERP shipping system because of the specific software; it was hard to use other software instead of ERP shipping system. Perceived long-term consequences mainly measured career development effect. In the study, most respondents did not work on the IS/IT line so that the ERP shipping plays a supportive role in their job. Therefore, this factor was non-significant. Surprisingly, perceived ease of use does not relate to intention to use ERP shipping systems. The fact that ERP shipping system was a new management system; especially in Thailand, and it had many modules to integrate information and business

processes within and across functional department. The users were often realized that the ERP shipping system is very complicated and difficult to learn.

To conclude, the results from the statistical analysis revealed that perceived near-term consequences and maritime organization factors are altogether important for intention to use ERP shipping system.

4.2.5 ERP shipping system adoption to use

The result of the statistical analysis show that ERP shipping system adoption to use is influenced by intention to use (beta coefficient = 0.734). The output of the statistical analysis is displayed in Table 11.

Table 11 Regression Results: Adoption to use

Variable	B	t	Sig. t
Intention to use	.734	17.781	.000
R= .734 , R^2= .538 , SEE= .681, F= 316.147 Sig. of F= .000			

The total of variance in ERP shipping system adoption to use explained by intention to use accounted for 54 percent. It can be seen that intention to use is an important prediction variables for ERP shipping system adoption to use. A better positive intention to use ERP shipping system will result in a higher ERP shipping system adoption. In this situation where technology adoption and acceptance are mandatory, intention to use ERP shipping system is a key significant factor affecting the success of ERP shipping system adoption. If the users perceived the outcomes of adopting and using ERP shipping system and respond desirable to it, they will have a positive feeling to use ERP shipping system, which will ultimately encourage system usage as well as affect user performance.

4.3 Summary of the relationship analysis

The casual relationship analysis with significant path coefficients, as shown in table 7-11 can be summarized and presented in the conceptual framework outlined in fig 9. The model illustrates the results of the path analysis in terms of both direct and indirect effects the nine factors impacting ERP shipping system adoption. Additionally, the summary of hypothesis testing results is shown in table 12.

Table 12 Summary of Hypothesis Testing Results

Hypothesis	Statement of relationship	Result
H1	Maritime organization factors will have a positive relation with intention to use.	Significant
H2	Maritime organization factors will have a positive relation with perceived long-term consequences.	Non - Significant
H3	Maritime technical factors will have a positive relation with perceived near-term consequences.	Significant
H4	Maritime technical factors will have a positive relation with perceived ease of use.	Significant
H5	Maritime individual factors will have a positive relation with perceived near-term consequences.	Significant
H6	Maritime individual factors will have a positive relation with perceived ease of use.	Significant
H7	Maritime regulation factors will have a positive relation with perceived near-term consequences.	Significant
H8	Perceived Cost will have a negative relation with intention to use.	Non - Significant
H9	Perceived ease of use will have a positive relation with near-term consequences.	Significant
H10	Perceived ease of use will have a positive relation with intention to use.	Non - Significant
H11	Perceived usefulness as near-term consequences will have a positive relation with intention to use.	Significant
H12	Perceived long-term consequences will have a positive relation with intention to use	Non - Significant
H13	Intention to use will have a positive relation with ERP shipping system adoption to use.	Significant

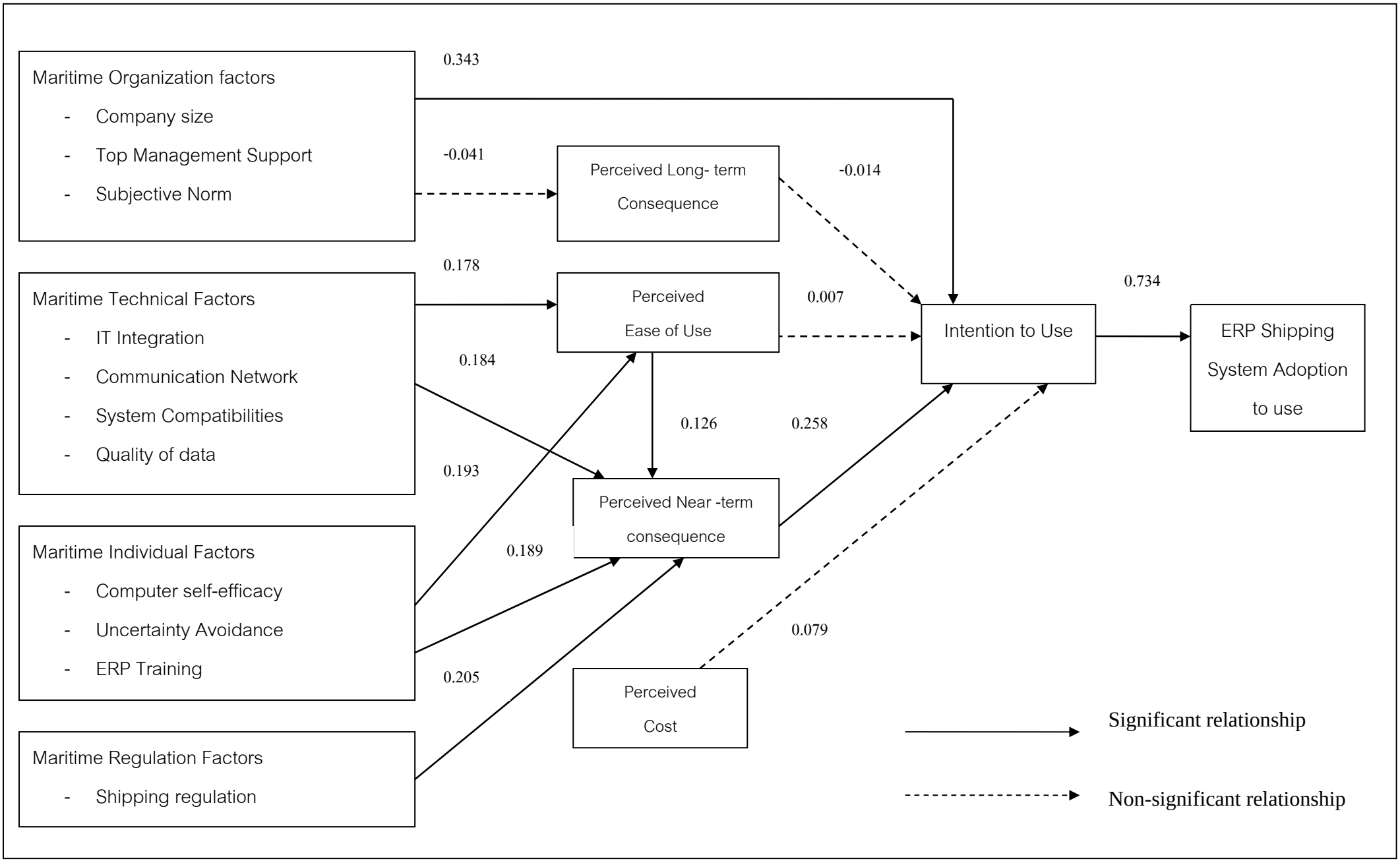

Fig 9. Path analysis of factor affecting ERP shipping system adoption