

Business Performance Measures for the Third-Party Logistics Industry in UAE



R. Ashok, R. Rajesh

Abstract: *Third party logistic market is booming everywhere in the world. Globalization of world economy, focusing on core competencies, logistic cost reduction, and delivery performance made companies focus on outsourcing logistics. Third party logistic market is an emerging trend in the United Arab Emirates. Due to the economic development, easy access to open business market, technological development, robotization of 3PL industry and globalization are the few determinants that the organizations wanted to invest their money in UAE. Third party logistic market is growing fast in Abu Dhabi in the same way as in Dubai, where the 3PL market is highly adopted with IT application and robotization in their 3PL operations. Data have been collected from the 3PL clients and the precise data were collected through questionnaire and field visit. Actually 102 calculated 3PL user companies took an interest in the survey. The collected information was analyzed by Friedman's test. This study reveals clear understanding about the various business performance measures for the third-party logistic industry in Abu Dhabi, UAE. Results have demonstrated that all the business performance measures in the 3PL user organizations have the "P" value which is under 0.01, with the null hypothesis rejected at 1 percent level of significance.*

Keywords: *3PLs, Friedman's ranking analysis, Business measures, Questionnaire survey, Abu Dhabi*

I. INTRODUCTION

All over the world, logistic outsourcing is a major business and common practice in most of the companies. This refers to the companies that have to approach other companies to do their activities by contract. Mainly they are approaching them to reduce their number of warehouses, vehicles, number of inventories and labor cost. It can make an important contribution to the competitive business and profitability through its role in reducing cost and improving customer services [1]. Due to order accuracy, time saving, good delivery, usage of IT, reduced logistics cost and customer satisfaction, the usage of 3PL service is increasing and developing day by day. Different researchers have carried out

surveys of the logistic outsourcing market all over the world. Even now it is continuing and going peak because of the development of 3PL market. According to the survey done by Lieb, 2001 in Fortune 500 manufacturers, Direct transportation services (61%), Warehouse management (59%) and Freight payment (53%) are the most frequently provided service and Inventory replenishment, and purchase of materials (4%) are the less outsourced activities. The 3PL market is in peak in Dubai. However, it has a rising pattern and is developing quickly in Abu Dhabi because of rapid globalization, extending exchange volume, recuperation of the overall economy, additional conventional advancement of development and enormous scale ventures, improvement of transportation foundation and geological area between the exchanging pathways. Coordination assumes a significant job in economy and every business improvement in the UAE. Previously various studies were undertaken to find the third-party logistics status in different countries. To the author's understanding, there was no survey conducted before in the UAE based on Abu Dhabi. This article presents an empirical analysis of the various business performance measures of the areas of shortfall from 3PL providers, impact created in logistics performance in 3PL user organizations, markets availing from 3PL users, factors of effectiveness to the success of 3PL Industry and major reasons to use 3PL services for the Third-party logistics industry in Abu Dhabi.

II. LITERATURE REVIEW

There has been a lot of research taking place on success factors, driving forces to outsource the logistic market, logistic performance measures and area of shortfalls for the third-party logistic market. This literature review clearly shows the situation of the business performance measures in 3PL market. Firstly, the success factors, are playing a major role in the 3PL operations. The selection of success factors shows that how the 3PL supplier and clients are depending on one another. The *success factor* selection might vary from location to location, depending upon the researcher's interest and 3PL client/firms' requirements. Different researchers have done their investigation based on the requirements. But few of them are notified in the literature review. In India, the delivery performance, flexibility and customer relationship are the requirements as expected by 3PL users from 3PL providers (Rajesh et al; 2013). According to Habibullah Khan; 2017, service quality is the important factor influencing 3PL service provider selection in Pakistan. Lianguang; 2009 found that the customer satisfaction is the most significant criterion in Swedish manufacturing industry.

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Price, reliability, service quality (Aguzzoul, 2007) and cost, reliability service quality and financial stability (Bagchi and Virum, 1996) show that these are the important criteria for choosing 3PLs suppliers. Moreover, the cost acts as an outstanding criterion (Van Laarhoven and Sharman, 1994); service performance and quality (Selviaridis and Spring, 2007).

Aktas and Ulengin, 2005 identified factors associations which lean toward the ease of collaboration, financial opportunities, honesty and quality of operations management and accurate order receipt and follow-up. They are the significant variables required for the fulfillment of 3PL operations. A portion of the organization has perceived that money related opportunities are the most significant variables for their fulfillment and other variables are less significant. Additionally, geological inclusion of 3PL specialist organizations and their experience are the significant elements that upgrade the use of Third-Party Logistics administrations (Sahay et al., 2006). Cost and quality are the significant predecessors for choosing the 3rd party logistics specialist (Hwang et al., 2016).

In the same way, *driving forces* have to play important role in the selection of 3PL services by clients. Some of the driving forces have been selected for the present investigation. One of the studies in India (Rajesh, 2013) revealed that focus on core competencies is the most important reason to outsource the services from 3PL providers and it's followed by improvement in customer service and reduction in logistics costs. B. S. Sahay and R. Mohan. (2006) found logistics cost reduction is an important aspect of outsourcing, followed by core competencies, and improved customer service. Habibullah Khan, 2017 demonstrates logistic cost reduction is the most important criterion to outsource the 3PL services. Accordingly, *Logistics performance measures* have been studied by many investigators. Dapiran (1996) analyzed the logistics costs impacts performance, logistics system performance and customer satisfaction while using 3PL services. Fawcett & Cooper (1998) analyzed logistics performances by consolidating together the 3PL suppliers and the organizations for the logistics performance factors, for example, asset management, cost, customer service, productivity and quality. B. S. Sahay (2006) described the organizational impact of Outsourcing Logistics Activities in India. The results demonstrated that about 50 percent of the clients have positive effect on the logistic system performance, customer satisfaction and employee morale. 4.5 percent showed that 3PL associations negatively affected employee morale and 3.2 percent have a negative effect on logistics system performance. M.S. Sohail (2005) discovered a solid positive impact on costs, system performance, and customer satisfaction and 68% of the respondents have positive impact on employee morale in the UAE. Rajesh (2013) found service level improvements, and fixed logistics asset reduction have the most impact on logistic performance measures in Indian 3PL market. Lianguang Cu (2009) saw that the use of TPL services had positive impact on logistics costs, customer satisfaction and labor cost and negative impact on production cost and employee morale.

For area of shortfalls of 3PL service provider, clients confront many shortages from 3PL specialist such as lack of implementation of up to date and advanced technology, lack

of strategic management skills, lack of continuous improvements, lack of knowledge-based skills, less flexibility in operation and delivery and lack of realization of cost reduction. Furthermore, he suggests to provide serving checklist for 3PL providers to monitor the quality of their customer relationships (Rajesh; 2013).

III.OBJECTIVES OF THIS STUDY

The intentions of the investigation are as follows:

- To identify and analyze the (a). Areas of shortfall created from 3PL providers, (2). Impact created in logistics performance in user organizations, (3). Factors for success of 3PL Industry, (4). Major reasons to use 3PL services, (5). Markets availing from 3PL user firms.
- Linear relationship between different business performance measures and (1). Use of 3PL services, (2). Satisfaction of 3PL provider.
- To examine the extent to which independent variables (Area of Shortfall from 3PL Operations, Performance of 3PL Operations, Markets Availing from 3PL users, and Success of 3PL Operations) influence dependent variables (Use of 3PL services).

IV. RESEARCH METHODOLOGY

A. SURVEY DESIGN

The study method was planned and utilized for data collection. Here the investigation utilized both primary and secondary data. The primary information was collected from the third-party logistics user organizations for analyzing various business performance measures for the Third-Party Logistics Industry in the UAE. Secondary information was gathered from the internet, proposals, different diaries and books. A five-point scale (1-indicating "not at all important" and 5- "Extremely important") for the factors influencing the success of 3PL industry and major reasons for using 3PL services. 1-indicating "Never" and 5- "Always" for the areas of shortfall from 3PL providers and 1-"Very negative" and 5-"Very positive" for the impact created in logistics performance measures by providing 3PL operations in a 3PL user organization. Different performance measures were perceived by the researchers in their preliminary studies. The positioning is given by the 3PL user firms according to their answers with the assistance of Friedman positioning methods and the mean scores are shown in the Table below:

B. DATA COLLECTION AND SAMPLING METHOD

Data were collected from 102 3PL user organizations who have good experience and knowledge in the third-party logistic industry. The data are accumulated from different organizations in Abu Dhabi area in the United Arab Emirates (Table-1&2).

Total number of Employees in UAE (Table-1)

		Frequency	Percent
Valid	Below 100	88	86.3
	100-250	7	6.9
	Above 250	7	6.9
	Total	102	100

Year of Start 3PL operations (Table-2)

		Frequency	Percent
Valid	Up to 2000	8	7.8
	2001-2005	27	26.5
	2006-2010	59	57.8
	Above 2010	8	7.8
	Total	102	100

About 200 questionnaires were given to the potential respondents. After regular follow-ups through mobile, 102 useable responses were received. Most of the respondents were contacted by field visit and some of them reported through mail. According to the data, 86% of the companies have less than 100 employees, 7% of the respondents have 100 to 250 and above 250 numbers of employee in each of them. Most of the organizations (59%) started their 3PL operations during the period of 2006 to 2010. 27% of the companies started 3PL operations in between 2001 and 2005. 8% of the companies started their outsourcing service approaches with 3PL firms before 2000 and after 2010. This table 1&2 demonstrate the employee size and the year of 3PL operations when they were started in the user organizations

C.DATA ANALYSIS AND HYPOTHESIS TESTING

The collected data are analyzed by SPSS and Analysis of Moment Structure (AMOS) Version 20.0. Different

Statistical techniques of Friedman Test, Correlation test and Regression analysis are used for the data examination and assessing the various business performance measures for the 3PL industry in Abu Dhabi, UAE.

V.RESULTS AND DISCUSSION

A. Various business performance measure of areas of shortfall from 3PL providers, impact created in logistics performance in 3PL user organizations, markets availing from 3PL users, factors of effectiveness to success of 3PL industry and factors for major reasons to use 3PL services for the third-party logistics industry.

Friedman’s ranking method was used to analyze the different business measures for the Third-party logistics industry in Abu Dhabi.

From table 3, we find that the P value is under 0.01, and so the null hypothesis is rejected at 1 percent level of significance with regard to the factor of Lack of realization of cost reduction (4.43) which is the most effective short fall, followed by Lack of consultative/knowledge-based skills (3.96), Lack of implementation of updating and advanced technology (3.67), Lack of continuous improvements (3.66), Less flexibility in operations and delivery (2.73) and Lack of strategic management skills (2.56).

Table 3: - Friedman test for significant difference among mean positions towards the Area of Shortfall from 3PL Providers

Factors for areas of shortfall from 3PL providers	Mean position	Rank	Chi-Square value	P value
Lack of realization of cost reduction	4.43	I	108.765	0.000**
Lack of consultative/knowledge-based skills	3.96	II		
Less flexibility in operations and delivery	2.73	V		
Lack of continuous improvements	3.66	IV		
Lack of strategic management skills	2.56	VI		
Lack of implementation of updating and advanced technology	3.67	III		

Note: 1. ** Indicates significant at 1% level

From table 4, shows that the P value is under 0.01, and hence the null hypothesis is rejected at 1 percent level of significance with regard to the factor of Customer Satisfaction (3.93) which is ranked first, followed by Internal Logistics System Performance occupy the second mean with a mean value 3.78. Logistics Cost reduction is the third rank

with a mean value of 3.14, Average order cycle length is the fourth rank with a mean value 2.75 and Employee Morale is the fifth rank with a lowest mean value 1.41.

Table 4: - Friedman test for significant difference among mean positions towards the Logistics Performance of 3PL Operations

Factors for impact created in logistics performance	Mean position	Rank	Chi-Square value	P value
Employee Morale	1.41	V	213.918	0.000**
Logistics Cost reduction	3.14	III		
Customer Satisfaction	3.93	I		
Internal Logistics System Performance	3.78	II		
Average order cycle length	2.75	IV		

Note: 1. ** Indicates significant at 1% level

From table 5, P value is less than 0.01. Hence, the null hypothesis is rejected at 1 percent level of significance with regard to the markets availing of 3PL user of Construction & Building Materials (16.26) which is ranked first, followed by manufacturing (14.15). Electronics has the third position with

a mean value of 11.5. Oil & Gas ranks fourth with a mean value 11.32. Chemicals has the fifth rank with a mean value 8.68, Automotive has the sixth rank with a mean value 8.5.



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Consumer packaged goods, Renewable energy, Food & Beverage, Apparel & Textiles, Furniture, Healthcare, Agriculture, and others are in the seventh rank with a mean

value 8.41. Aerospace, Grocery, Pharmaceuticals and Trade show are found to be the least Successful in Abu Dhabi. They have the lowest mean value of 8.32.

Table 5: - Friedman test for significant difference among mean positions towards the Markets Availing from 3PL Users

Markets availing from 3PL Users	Mean position	Rank	Chi-Square value	P value
Aerospace	8.32	VIII	985.515	0.000**
Agriculture	8.41	VII		
Automotive	8.5	VI		
Chemicals	8.68	V		
Construction & Building Materials	16.26	I		
Consumer packaged goods	8.41	VII		
Electronics	11.5	III		
Renewable energy	8.41	VII		
Food & Beverage	8.41	VII		
Apparel & Textiles	8.41	VII		
Furniture	8.41	VII		
Grocery	8.32	VIII		
Healthcare	8.41	VII		
Oil & Gas	11.32	IV		
Pharmaceuticals	8.32	VIII		
Trade show	8.32	VIII		
Manufacturing	14.15	II		
Others-----	8.41	VII		

Note: 1. ** Indicates significant at 1% level

From table 6, we find that as the P value is under 0.01, the null hypothesis is rejected at 1 percent level of significance. Among the factors we identify that Cost (9.58) is the most effective factor for success, which is followed by Delivery time (9.36), Strategic commitment to customers (9.06), Quality of services (8.6), Attitude towards customer /

relationship (8.27), Ability to meet customer needs (8.24), Documents accuracy (8.14), Flexibility (7.97), Reputation (6.9), Storage facilities (6.83), Technical competence (6.51), Financial stability (6.47), Good communication (4.7) and Reliability of the 3PL provider (4.36).

Table 6: - Friedman test for significant difference among mean positions towards the factors of effectiveness of success of 3PL Industry.

Factors of effectiveness of success of 3PL Industry	Mean position	Rank	Chi-Square value	P value
Delivery time	9.36	II	373.41	0.000**
Flexibility	7.97	VIII		
Attitude towards customer/relationship	8.27	V		
Strategic commitment to customers	9.06	III		
Reliability of the 3PL provider	4.36	XIV		
Reputation	6.9	IX		
Ability to meet customer needs	8.24	VI		
Storage facilities	6.83	X		
Quality of services	8.6	IV		
Cost	9.58	I		
Good communication	4.7	XIII		
Financial stability	6.47	XII		
Documents accuracy	8.14	VII		
Technical competence	6.51	XI		

Note: 1. ** Indicates significant at 1% level

From table 7, it is understood that the P value is under 0.01, and so the null hypothesis is rejected at 1 percent level of significance with regard to Logistics cost reduction (14.56) ranked first, followed by improved customer service (13.99). To better process responsiveness occupies the third rank with

a mean value of 13.86. Improve process capability and cycle time has the fourth rank with a mean value 13.73. Productivity improvements have fifth rank with a mean value 11.56.

Improve conformance quality occupies sixth rank with a mean value 11.5.

To develop supply chain flexibility is in the seventh rank with a mean value 11.24. Focus on core competencies has the eighth rank with mean a mean value 9.75. Corporate restructuring is the ninth rank with a mean value 8.17. Improve process lead time has the tenth rank with a mean value 7.84. Access/Expansion to unfamiliar markets is in the eleventh rank with mean value 5.69. To increase inventory turn has the twelfth rank with a mean value 5.11. Access to

emerging technologies is in the thirteenth rank with a mean value 5.69. Improve return assets occupies the fourteenth rank with a mean value 5.07. Operation of IT systems is in the fifteenth place with a mean value 4.77. Diverting capital investment has taken the sixteenth place with a mean value 4.76 and E-Commerce application is found to be the least Success factor in third party logistics user firms. It has the lowest mean value of 4.74.

Table 7: - Friedman test for significant difference among mean positions towards the Factors for major reasons to use 3PL services

Factors for major reasons to use 3PL services	Mean position	Rank	Chi-Square value	P value
Focus on core competencies	9.75	VIII	1055.896	0.000**
Logistics cost reduction	14.56	I		
Improved customer service	13.99	II		
Improve conformance quality	11.5	VI		
Improve process capability and cycle time	13.73	IV		
To develop supply chain flexibility	11.24	VII		
Improve process lead time	7.84	X		
To better process responsiveness	13.86	III		
Access to emerging technologies	5.69	XIII		
Access/Expansion to unfamiliar markets	6.65	XI		
Operation of IT systems	4.77	XV		
Productivity improvements	11.56	V		
Corporate restructuring	8.17	IX		
Improve return assets	5.07	XIV		
To increase inventory turn	5.11	XII		
Diverting capital investment	4.76	XVI		
E-Commerce application	4.74	XVII		

Note: 1. ** Indicates significant at 1% level

B. CORRELATION ANALYSIS

Table-8 shows that the Pearson Correlation Coefficient between Business Performance Measures and Satisfaction of 3PL provider for the Third-Party Logistics Industry in UAE.

		Area of Shortfall from 3PL Operations	Performance of 3PL Operations	Markets Availing from 3PL Users	Success of 3PL Operations	Use of 3PL Services
Satisfaction of 3PL provider	Pearson Correlation	.494**	.441**	.418**	.578**	.463**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	102	102	102	102	102

Table-8

**** Correlation is significant at the 0.01 level (2-tailed)**

Area of Shortfall from 3PL Operations (r=.494, p<0.01), Performance of 3PL Operations (r=.441, p<0.01), Markets

Availing 3PL Providers (r=.418, p<0.01), Success of 3PL Operations (r=.578, p<0.01) and Use of 3PL Services (r=.463, p<0.01) are all correlated with Satisfaction of 3PL provider.

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Table-9 shows that Pearson Correlation Coefficient between Business Performance Measures for the Third-Party Logistics Industry in the UAE.

		Area of Shortfall from 3PL Operations	Performance of 3PL Operations	Markets Availing from 3PL Users	Success of 3PL Operations	Use of 3PL Services
Area of Shortfall from 3PL Operations	Pearson Correlation	1	.585**	.713**	.498**	.885**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	102	102	102	102	102
Performance of 3PL Operations	Pearson Correlation	.585**	1	.782**	.534**	.775**
	Sig. (2-tailed)	0.000		.000	.000	.000
	N	102	102	102	102	102
Markets Availing from 3PL Users	Pearson Correlation	.713**	.782**	1	.480**	.840**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	102	102	102	102	102
Success of 3PL Operations	Pearson Correlation	.498**	.534**	.480**	1	.549**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	102	102	102	102	102
Use of 3PL Services	Pearson Correlation	.885**	.775**	.840**	.549**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	102	102	102	102	102

Table-9

Note: - **. Correlation is significant at the 0.01 level (2-tailed).

The results reveal that Performance of 3PL Operations ($r=.585, p<0.01$), Markets Availing from 3PL Users ($r=.713, p<0.01$), Success of 3PL Operations ($r=.498, p<0.01$), Use of 3PL Services ($r=.885, p<0.01$) are all correlated with Area of Shortfall from 3PL Operations.

Area of Shortfall from 3PL Operations ($r=.585, p<0.01$), Markets Availing from 3PL Users ($r=.782, p<0.01$), Success of 3PL Operations ($r=.534, p<0.01$), Use of 3PL Services ($r=.775, p<0.01$) are all correlated with Performance of 3PL Operations.

Area of Shortfall from 3PL Operations ($r=.498, p<0.01$), Performance of 3PL Operations ($r=.534, p<0.01$), Markets Availing from 3PL Users ($r=.480, p<0.01$), Use of 3PL Services ($r=.549, p<0.01$) are all correlated with Success of 3PL Operations.

Area of Shortfall from 3PL Operations ($r=.885, p<0.01$), Performance of 3PL Operations ($r=.775, p<0.01$), Markets Availing from 3PL Users ($r=.840, p<0.01$), Success of 3PL Operations ($r=.549, p<0.01$) are all correlated with the Use of 3PL Services.

Area of Shortfall from 3PL Operations ($r=.713, p<0.01$), Performance of 3PL Operations ($r=.782, p<0.01$), Success of 3PL Operations ($r=.480, p<0.01$), Use of 3PL Services ($r=.840, p<0.01$) are all correlated with Markets Availing from 3PL Users.

C. REGRESSION ANALYSIS

Linear regression analysis was conducted to examine the extent to which the independent variables (Success of 3PL Operations, Markets Availing from 3PL Users, Area of Shortfall from 3PL Operations, Performance of 3PL Operations) influence Use of 3PL Services (dependent variable). Considering the linear correlation between the

independent variables and dependent variable, all the four independent performance measures are accepted to conduct the testing model. Continuously, regression model is employed with Enter method to consider the weight of antecedent contributing to Use of 3PL Services. The coefficient of determination, R squared ($R^2 = 0.899$) indicates how well data fit a statistical model. It presents the various business performance measures for the third-party logistic industry which are explained by 89.9% of variations in Success of 3PL Operations, Markets Availing from 3PL Users, Area of Shortfall from 3PL Operations, Performance of 3PL Operations and Use of 3PL services. Overall efficiency of use of 3PL services in the business market in 3PL Industry, UAE. $R=.948^a$, $R\text{ Square}=.899$, Adjusted $R\text{ Square}=.895$, $F=216.644$, $P\text{ value}<0.001^{**}$.

Dependent Variable: Use of 3PL Services, b. Predictors: (Constant), Success of 3PL Operations, Markets Availing from 3PL Users, Area of Shortfall from 3PL Operations, Performance of 3PL Operations. From the above values, it is clearly seen that the significance value is less than 0.01. Hence, it is found that the third-party logistic industry is regularly updating and this performance measure does not affect the use of 3PL services and the null hypothesis is rejected.

Coefficients^a
Table-10

Model	Nonstandard Coefficients		Standard Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	12.821	2.301		5.573	.000
	Area of Shortfall from 3PL Operations	0.952	0.081	0.56	11.794	.000
	Performance of 3PL Operations	0.671	0.143	0.254	4.708	.000
	Markets Availing from 3PL Users	0.888	0.232	0.23	3.836	.000
	Success of 3PL Operations	0.024	0.041	0.023	0.591	0.556

The study of the regression analysis shown in Table-10 points out that Area of Shortfall from 3PL Operations ($\beta=.560$, $p<0.01$), Performance of 3PL Operations ($\beta=.254$, $p<0.01$), Markets Availing from 3PL Users ($\beta=.230$, $p<0.01$) significantly affect the use of 3PL services. The results show, surprisingly, that Success of 3PL Operations ($\beta=0.023$, $p>0.05$) does not seriously affect the Use of 3PL Services, in

which Area of Shortfall from 3PL Operations is the most important performance measures in the Third-party logistic industry, followed by Performance of 3PL Operations, and Markets Availing from 3PL Users. It seems that there is a highly significant relationship between the independent variables and Use of 3PL services (the dependent variable). This result corresponds with the view of Akram Jalal, 2011[7].

VI. CONCLUSION

From the Friedman’s test, Lack of realization of cost reduction is the important area of shortfall from 3PL providers. Customer Satisfaction is the most impact Logistics Performance measures in 3PL user companies. Cost is the most important factor for success in the 3PL market in UAE and logistic cost reduction is the important reason for outsourcing the logistic activities. Construction & Building Materials enjoy fast-moving market in Abu Dhabi. These areas have “P” value which is under 0.01 with the rejection of the null hypothesis at 1 percent level of significance and must be centered around more improvements by applying certain factors such as reduced logistic cost, improving satisfaction and relationship with customer. Cost is the most important factor for area of short falls from 3PL provider, success factor to develop 3PL market and driving force to outsource. So, 3PL firms have to concentrate on cost in their 3PL operations by reducing logistics cost. From the Pearson Correlation Coefficient Analysis, the various business performance measures of areas of shortfall from 3PL providers, impact created in logistics performance in 3PL user organizations, markets availing from 3PL users, factors of effectiveness to the success of 3PL Industry and major reasons for using 3PL services are highly correlated with the Third-party logistics industry in Abu Dhabi, UAE and all business measures are highly correlated with satisfaction of 3PL providers. There is a reliable and statistically significant association between the use of 3PL providers and Area of Shortfall from 3PL Operations, Performance of 3PL Operations, and Markets Availing from 3PL Users. This study promotes the 3PL firms and the association authorities, higher officials and others, to understand the 3PL status in Abu Dhabi and to be increasingly proactive.

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