

Exploration of the Quality Process of Pet E-commerce Logistics Service

Ting Chihsiang^{1,a,*}, Chang Chinlien^{2,b}, Li Chen^{1,c}, Zhang Lin^{1,d}, Xia Yongqiu^{1,e},
Ding Zhiyuan^{1,f}

¹Faculty of Management Engineering, Huaiyin Institute of Technology, Huai'an, China

²Student Affairs Office, Huaiyin Institute of Technology, Huai'an, China

^adjs1966@foxmail.com, ^b2016185135@qq.com, ^c623461330@qq.com, ^d105635568@qq.com,

^e2389922050@qq.com, ^f1531730824@qq.com

*Corresponding author

Abstract: This study investigates the usage of e-commerce by pet consumers through online platforms. The survey found that consumers have an impact on the quality of pet e-commerce logistics services. These four factors are transportation condition indicators, operational indicators, safety protection indicators, Information feedback indicators, they will impact service competition indicators. It can be seen that consumers are cautious when choosing platforms in the early stage, which has a significant impact on their selectivity. Therefore, online e-commerce needs to strengthen the promotion and business model of online platforms to gain the trust of consumers.

Keywords: logistics engineering, e-commerce, pet e-commerce, service quality

1. Introduction

The 2021 White Paper on Pet Consumption Trends in China shows that the majority of pet owners in China are those born after 80 years and those born after 90 years. Among them, the population born after the 1980s accounted for 30.5%, and the population born after the 1990s accounted for 46.3%. More and more young people are pursuing a high-quality spiritual life, which is gradually changing the role pets play in their lives[1]. The younger generation tends to view pets as family. There is an urgent need for the companionship of pets, and keeping pets has become a fashionable way of life for young people nowadays. With the development and progress of society, the improvement of people's living standards, changes in family structure, and other factors. The phenomenon of raising pets in households is more common in our country, and the pet product market is more diverse. For example, there are various types of products such as shower gel and aromatherapy liquid, and their prices also vary. In addition, the pet product market has diversified brands and significant price differences (Du Xiaomin, 2022) [2].

With the rapid rise of the Internet, Tiktok, as a representative of short video APP, has become an indispensable tool for people to share life and communicate. The pet short videos on Tiktok have won the favor of a large number of audiences by virtue of their interesting content, cheerful and relaxed rhythm, and outstanding emotional comfort effect (Wang Xueliang, 2022) [3]

2. Literature Review

The design of pet food packaging is based on emotional design elements, which can be summarized into the following three points: 1) satisfying the user's five sensory stimuli, 2) satisfying the user's interactive experience, and 3) satisfying the user's emotional needs. Supported by three advantages, pet food packaging design can be correspondingly improved in various aspects such as visual, functional, and emotional aspects. It can further attract users to purchase products. As product sales increase, greater economic value can be created (Zhang Xin, Wang Jia, 2022) [4]

From this phenomenon, it has been discovered that the influence of the Internet cannot be ignored, and it has a great temptation for consumers. The factors that need to be considered to improve the service quality of e-commerce include: 1) clear service items, 2) simple operation functions, 3) convenient communication platforms, 4) secure online transactions, and 5) product quality assurance (Gao Ranran, Huo Furen, 2023) [5]

Conduct research on pet apps and websites that provide information on pets in Langfang City. 35% of pet owners in Langfang City used to learn about pet ownership from their relatives, friends, and colleagues. And support adopting instead of purchasing. 24% of pet owners use pet apps and websites. Pet owners born in the 1990s prefer internet information, especially those who believe in live pet trading platforms, namely pet e-commerce. And "80s generation" prefer to communicate information on social media. This provides ideas for advertising pet products (Liu Qian, Ji Lisa, Zhao Dongfeng, 2022) [6]. Therefore, this study focuses on exploring the quality process of pet e-commerce logistics services.

3. Research Methods

This study conducted a random survey and distributed 147 valid questionnaires to consumers in Huai'an City who are currently shopping on pet e-commerce platforms. Using the Likert five point scale as the questionnaire, the lowest score is 1 point and the highest score is 5 points. The reliability analysis value of this questionnaire is standardized Cronbach α The coefficient is 0.968, and the reliability value of the questionnaire is very high, with an average of 3.50-3.69 and a standard deviation of 0.41-0.48 in table 1.

Table 1: Standard deviation analysis

Indicators items	mean value	standard deviation
Transportation condition indicators (Factor 1)		
Pet health	3.5782	0.2653
transportation equipment	3.5918	0.0119
transportation environment	3.6735	0.0544
Operational indicators (Factor 2)		
on-time delivery capability	3.6054	0.9907
error handling capability	3.6403	0.0054
standardized transportation processes	3.6237	0.0141
Safety protection indicators (Factor 3)		
epidemic prevention management for express delivery personnel	3.6871	0.9976
disinfection operations for pet transportation	3.6259	0.1053
survival rate of pet transportation	3.5782	0.1282
Information feedback indicators (Factor 4)		
tracking feedback on pet transportation information	3.6939	0.0311
feedback on unexpected situations during pet transportation	3.5034	0.1249
feedback on pet transportation receipt forms	3.6122	0.2335
Service competition indicators (Factor 5)		
degree of attention paid to customer demands	3.6871	0.5209
limitations on the volume and weight of pet transportation	3.6191	0.0090
price and cost of pet transportation	3.6395	0.0927

4. Research results

4.1. Demographic data analysis

The total number of valid samples in this questionnaire is 147, and the analysis results (1) show that male students account for 56.46% and female students account for 43.54% in the gender section. (2) The age group consists of 34.69% aged between 18 and 26, 34.01% aged between 26 and 30, and 16.33% aged between 31 and 40., 9.52% are aged 41 to 50, and 5.44% are aged 51 and above. (3) 34.01% are unmarried and 65.99% are married. (4) The education level of some ethnic groups is 34.01% for vocational education and 54.42% for undergraduate education. (5) The monthly income amount is approximately 23.13% for ethnic groups ranging from 4000 to 5999 yuan, 39.46% for ethnic groups

ranging from 6000 to 7999 yuan, and 20.41% for ethnic groups ranging from 8000 to 10000 yuan. (6) The occupational types are 0.68% for students, 6.12% for civil servants, 43.54% for office workers, and 12.93% for self-employed enterprises. (7) The frequency of using express delivery in daily life is 53.71% once a week, 35.4% once every three weeks, and 11.6% once a month.

4.2. Pearson correlation analysis

After conducting preliminary expert interviews, this study summarized the factors that consumers are concerned about and divided them into five categories. The first type (F1) of factor is transportation conditions indicators. The content of the question is: pet health, transportation equipment, transportation environment. The second type (F2) of factor is Operational indicators. The content of the question is: Operational indicators, on-time delivery capability, error handling capability, standardized transportation processes. The third type (F3) of factor is Safety protection indicators. The content of the question is: epidemic prevention management for express delivery personnel, disinfection operations for pet transportation, survival rate of pet transportation. The fourth type (F4) of factor is Information feedback indicator. The content of the question is: tracking feedback on pet transportation information, feedback on unexpected situations during pet transportation, feedback on pet transportation receipt forms.

The fifth type (F5) of factor is Service competition indicators. The content of the question is: degree of attention paid to customer demands, limitations on the volume and weight of pet transportation, price and cost of pet transportation. After Pearson correlation analysis, the five related factors have a high correlation with each other above 0.482, as shown in Table 2.

Table 2: Pearson correlation analysis

	Transportation conditions indicators(F1)	Operational indicators(F2)	Transportation conditions indicators(F3)	Information feedback indicators(F4)	Service competition indicators(F5)
Transportation conditions indicators(F1)	1	0.482**	0.487**	0.512**	0.849**
Operational indicators(F2)	0.482**	1	0.837**	0.860**	0.826**
Transportation conditions indicators(F3)	0.487**	0.837**	1	0.860**	0.868**
Information feedback indicators(F4)	0.512**	0.860**	0.860**	1	0.868**
Service competition indicators(F5)	0.849**	0.826**	0.868**	0.868**	1

Note: * Table $p < 0.05$, ** Table $p < 0.01$, *** Table $p < 0.001$

4.3. Model regression coefficients

Through the regression coefficients of the path nodes, it can be understood as a least squares univariate linear regression. Usually, only the P-value and the standardized path coefficient need to be observed to determine whether the path (X → Y) has a direct linear impact. According to the significance test analysis ($P < 0.05$), whether there is an impact relationship between the model variables. If there is significance, it indicates that there is an influence relationship between variables, and the standardized path coefficient can be used for in-depth analysis of the impact efficiency.

In this research and development, factors 1, 2, 3, 4, and 5 were found to be correlated through multiple regression analysis, as shown in Table 3. Based on paired item factors 1 → factor 5, the significance P-value was 0.00 **, indicating significance at the horizontal level. Therefore, the null hypothesis is rejected, and this path is valid with an impact coefficient of 0.849. Based on the paired factor 2 → factor 5, with a significance P-value of 0.00 **, the null hypothesis is rejected as significant at the horizontal level. This path is valid, with an impact coefficient of 0.865. Based on the paired factor 3 → factor 5, with a significance P-value of 0.02 **, the null hypothesis is rejected, and this path is valid with an impact coefficient of 0.868. Based on the paired factor 4 → factor 5, with a significance P-value of 0.03 **, the null hypothesis is rejected as significant at the horizontal level. Therefore, this path is valid with an

impact coefficient of 0.858. As shown in Table 3 and Figure 1.

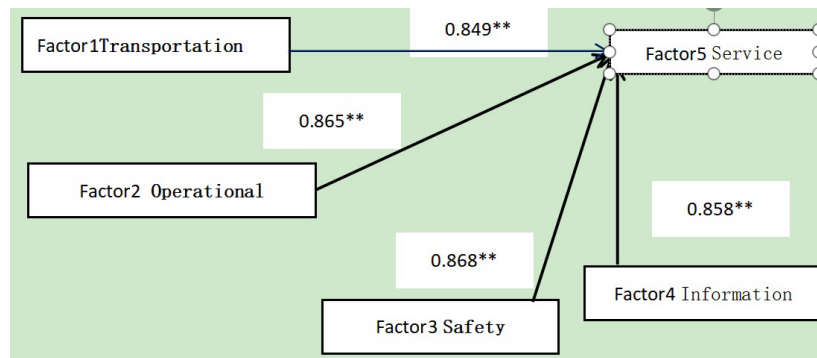


Figure 1: Pet E-commerce Service Quality Model

Table 3: Regression coefficients of the model

X	→	Y	Non standardization coefficient	Standardization coefficient	S.E.	C.R.	P
Factor1	→	Factor5	0.469	0.849	0.027	17.514	0.00**
Factor2	→	Factor5	0.857	0.865	0.052	16.444	0.00**
Factor3	→	Factor5	0.145	0.868	0.048	3.040	0.02**
Factor4	→	Factor5	0.343	0.858	0.114	3.017	0.03**

Note: ***, **, * represent significance levels of 1%, 5%, and 10%, respectively

4.4. Model Regression Coefficients

Table 4 shows the fitting indicators of the model, with high p-value significance. Other commonly used indicators include chi square degree of freedom ratio, GFI, RMSEA, RMR, CFI, NFI, and NNFI. The chi square and degree of freedom df are mainly used to compare multiple models. The smaller the chi square value, the better. The degree of freedom reflects the complexity of the model. The simpler the model, the more degrees of freedom it has. Conversely, the more complex the model, the fewer degrees of freedom it has. GFI (goodness of fit index): It mainly uses judgment coefficients and regression standard deviation to test the degree of fit of the model to the observed values of the sample. Its value ranges from 0 to 1, and the closer it is to 0, the worse the fit. If $CFI \geq 0.9$, it is considered that the model fits well. The GFI value of this study is 0.901. RMSEA (Root Mean Square Error): In general, RMSEA is below 0.08 (the smaller the better). The RMSEA value of this study is 0.686. RMR (Root Mean Square Residual): This indicator measures the degree of fit of the model by measuring the average residual between predicted correlation and actual observed correlation. If $RMR < 0.1$, it is considered that the model fits well. The RMR value of this study is 0.707. CFI (Comparative Fit Index): This index has a value between 0-1 when comparing hypothetical and independent models. The closer it is to 0, the worse the fit, and the closer it is to 1, the better the fit. In general, if the CFI is ≥ 0.9 , it is considered that the model fits well. The CFI value of this study is 0.902. NNFI (Non canonical Fit Coefficient) and CFI (Comparative Fit Index): The larger the value, the better, and the better the fitted model performs. The NNFI value of this study is 0.412. The model of this study has high compatibility. As shown in Table 4.

Table 4: Model fitting indicators

X ²	df	P	chi-square	GFI	RMSEA	RMR	CFI	NFI	NNFI
-	-	>0.05	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
47.563	1.000	0.000***	47.563	0.901	0.686	0.707	0.902	0.901	0.412

Note: ***, **, * represent significance levels of 1%, 5%, and 10%, respectively

5. Conclusions

This study investigates the usage of e-commerce by pet consumers through online platforms. The survey found that consumer competition for pet services has an impact. For example, the first type of transportation condition indicator, the second type of operation indicator, the third type of safety protection indicator, and the fourth type of information feedback indicator all have an impact on the fifth

type of service competition indicator. The path analysis of these four factors often has an impact on the fifth factor, and the R-coefficient values are all high. It can be seen that the level of attention consumers place on the platform in the early stages affects their selectivity. In conclusion, online e-commerce needs to strengthen the promotion and business model of online platforms in order to win the trust of consumers.

Acknowledgements

Thank you for the innovation and entrepreneurship funding subsidy for college students at Huaiyin University of Technology, 202311049319YJ. Team members: Guo Xiangpeng, Zhang Zhenwei, Du Xiangjie, Chen Yanxu.

References

- [1] Shanghai Airui Market Consulting Co., Ltd. *White Paper on Pet Consumption Trends in China* [M]. Research Consulting's series of research reports. 2021, <https://www.iresearch.com.cn/Detail/report?Id=3779&isfree=02021-05-01>
- [2] Du X.M. *Survey and Analysis of Market Sales of Pet Shower Gel* [M]. *Pet Column*. 2022, 125-126
- [3] Wang X.L. *Analysis of the reasons for the popularity of Tiktok pet short videos* [N]. *News Research Guide*, 2022, 13 (22) 105-107
- [4] Zhang X.Y., Wang J. *Research on Pet Food Packaging Design Based on Emotional Design* [J]. *Industrial Design*. 2022, 68-70
- [5] Gao R.R., Huo F. R., *Research on the Design of a Service Based Pet Dog Training APP* [N]. *Exploration of Product Learning*. 2023, DOI: 10.20055/j.cnki.1003-10069.00361
- [6] Liu Q., Ji L.S., Zhao D.F. *The Development and Market Expansion Path of Pet Economy in Langfang City*[J]. *China Animal Husbandry*, 2022, 16, 125-126.