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A Survey Study on Consumers' Perceptions and Continued Willingness to Kill Big Data under the Booming Digital Economy

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ABSTRACT

This paper focuses on the hot issue of big data kills familiarization, takes Anhui Province as the research place, thoroughly studies the cognitive status quo of the residents of four cities in Anhui Province on the phenomenon of big data kills familiarization and the continuous willingness of consumers, and analyzes the impact of big data kills familiarization on consumers and the coping strategy, which, on the one hand, helps to safeguard the fair competition in the market and the rights and interests of consumers, and on the other hand, provides new perspectives and ideas for enriching and perfecting the theory of the digital economy, which is conducive to promoting the healthy and orderly development of digital economy.

KEYWORDS

Digital Economy; Big Data Kill; Perceived Status; Sustained Willingness

1. INTRODUCTION

Since the beginning of the 21st century, China has been implementing innovative policies and steadily increasing its level of economic and technological development, and the "digital era" has already begun. Against the backdrop of a booming digital economy, data is constantly changing our lives and ways of thinking, and has become an important tool in production and life [1]. General Secretary Xi Jinping has made many important speeches, strengthened the strategic planning and top-level design of network security work, and promoted the continuous improvement of China's network security system, the continuous enhancement of network security capacity, and the increasing consolidation of network security barriers, which has provided strong support and solid guarantee for accelerating the construction of a strong network country [2].

With the rapid development of information technology, big data has become an important force driving modern economic and social development [3]. In this context, an in-depth study of the phenomenon of big data kills maturity, exploring the current status of its cognition, influencing factors, and the continued willingness of consumers, not only has important theoretical value, but also has urgent practical significance [4]. This study aims to deeply analyze the internal mechanism and influence mechanism of big data killing through systematic theoretical analysis and empirical research, so as to provide new perspectives and ideas for enriching and improving the theory of digital economy.

2. DATA PROCESSING

This paper focuses on the hot issue of big data kills familiarization, takes Anhui Province as the research place, thoroughly studies the cognitive status quo of the residents of four cities in Anhui Province on the phenomenon of big data kills familiarization and the continuous willingness of consumers, and analyzes the impact of big data kills familiarization on consumers and the coping strategy, which, on the one hand, helps to safeguard the fair competition in the market and the rights and interests of consumers, and on the other hand, provides new perspectives and ideas for enriching and perfecting the theory of the digital economy, which is conducive to Promoting the healthy and orderly development of digital economy [5].

This research adopts various sampling methods, and finally 1500 questionnaires were sent out and 1280 questionnaires were recovered, with an effective recovery rate of 85.33%. The data passed the reliability, validity, travel test and randomness test, and the actual limiting error was 2.987%, which indicates that the results of the questionnaire are real and reliable, and the data quality is high.

3. AN EXPLORATION OF K-MEANS CLUSTER ANALYSIS BASED ON THE CHARACTERISTICS OF CONSUMERS' PERCEPTIONS OF BIG DATA KILLERS

3.1. Concept and Method Selection

K-means clustering divides the set of samples into k subsets, constituting k classes, and classifies n samples into k classes, with each sample having the smallest distance to the center of the class to which it belongs [6].

3.2. Variable Selection

With reference to the existing literature and research, and considering the selection of clustering variables, the following five variables are selected for the analysis of respondents' cognitive characteristics of big data killing, as shown in the Table 1 below.

Table 1. Description of variables and questions

Dependent variable	Questionnaire questions
Basic awareness	Degree of understanding of big data killers
Subjective willingness	Willingness to contribute to the development of policies to circumvent big data killers
Perceived awareness	Self-assessment of perception of encountering big data cooking
Significance of role	Perceived significance of regulating big data killing policies on consumers
Degree of response	Whether or not they will respond positively to the relevant policies

3.3. Analysis of Results

Cluster analysis was performed by Python to categorize the 1280 respondents into A, B, C, and D categories.

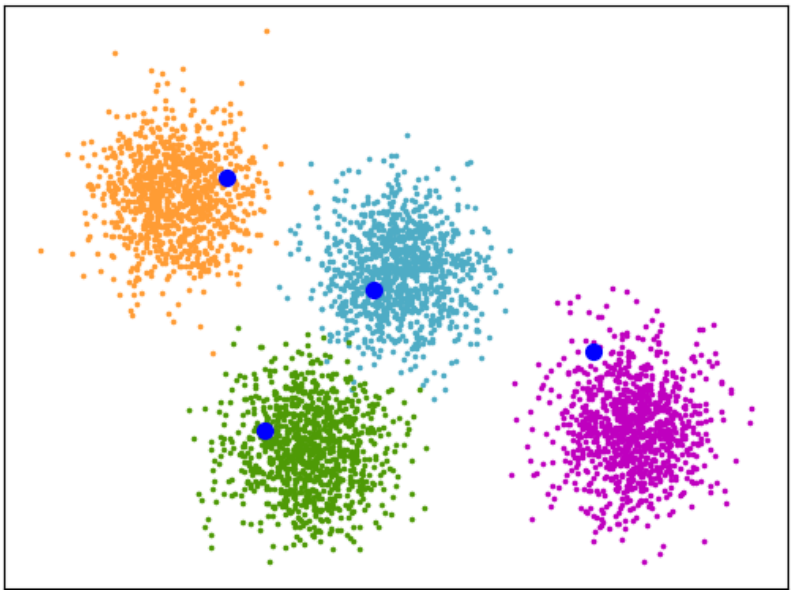

Figure 1. Distribution map of cluster analysis of cognitive characteristics

Table 2. Table of cognitive features cluster distribution characteristics

Category	Category A	Category B	Category C	Category D
Basic understanding	8	10	6	10
Subjective will	6	6	2	6
Perception	8	6	10	10
Significance of Role	7	10	1	7
Response Level	7	10	7	10

According to the cognitive classification characteristics of the four types of groups in Table 2, this paper carries out the following descriptive analysis:

(1) Class A consumer group

Class A consumers basically understand big data killing, for them, if they have the opportunity to contribute to the development of big data circumvention policy, they will consider responding to this policy, and the perception awareness is high, although they think that the big data control policy has no effect on the consumers, but they will consider responding to the circumvention policy.

(2) Class B Consumer Group

Class B consumers know a lot about big data killing, for them, if they have the opportunity to contribute to the development of big data circumvention policy, they will consider responding to this policy, and their perception awareness is relatively high. This group believes that the circumvention policy is beneficial to consumers and is of great significance, and if there is an opportunity they will definitely respond to the promotion of the big data avoidance policy, and this group has a high subjective initiative for the promotion of the big data avoidance policy.

(3) Class C Consumer Group

Consumers of category C have a half-understanding of the big data killing policy, and they think that the development of the big data killing policy is the responsibility of the relevant departments, which does not protect their interests well and has nothing to do with them, so they won't actively support the policy. However, the perceptual awareness of the group of category C is very high, and although they don't understand the effect of the big data killing policy on consumers, if there is an opportunity,

they will consider responding to the propaganda of the big data killing policy. Data killing policy publicity.

(4) Class D Consumer Group

Consumers in Category D are very aware of the big data killing policy, and for them, they would consider responding to the circumvention policy development if there is an opportunity to contribute to it, and their perceptual awareness is very high. Although they do not think that the circumvention policy is significant for the protection of consumer interests, they will definitely respond to the publicity of the big data killing policy if they have the opportunity to do so.

4. EVALUATION OF CONSUMER BEHAVIOR BASED ON PRINCIPAL COMPONENT ANALYSIS

4.1. Quantification of the Questionnaire Questions on the Degree Of Influence of Big Data "Ripening" on Consumer Behavior

After thorough preparation and in-depth understanding of big data "kill familiarization", this paper proposes the following 16 questions on the evaluation of the impact of big data "kill familiarization" on consumer behavior based on the current status of big data "kill familiarization". This paper proposes the following 16 questions on the evaluation of the degree of influence of big data "kill mature" on consumer behavior. In order to facilitate the subsequent clustering and analysis of the questions, it is necessary to carry out relevant and reasonable quantitative processing of the question options, and the specific questions are as follows in Table 3 [7].

Table 3. Illustrative table for evaluating the impact of big data "kills" on consumer behavior

Variables	Question content	Scoring principles
X_1	I think that buying goods on the platform is guaranteed.	Rated on a scale of 2, 4, 6, 8, 10, from "Strongly Disagree" to "Strongly Agree"as" 2""4""6" "8" and "10"
X_2	I think the platform is trustworthy.	
X_3	I would like to continue to use the platform to purchase goods.	
X_4	I think the prices of the products presented to me are fair.	
X_5	I think the price of goods presented to me on the platform is acceptable despite price fluctuations.	
X_6	I would choose this platform even if I am being ripped off due to time and other factors.	
X_7	The service quality of the platform will affect my purchasing decision.	
X_8	The quality of the platform's logistics will affect my purchasing decision.	
X_9	The popularity of the platform will influence my purchase decision.	
X_{10}	The membership mechanism of the platform will influence my buying decision.	
X_{11}	I think I can avoid being overcharged if I have an external price reference.	
X_{12}	I think the government's avoidance policy against overcharging can effectively curb overcharging.	
X_{13}	I think the economic environment will affect my purchasing decision.	
X_{14}	I hope the platform can provide more price protection measures, such as seven-day price guarantee and historical lowest price guarantee, to enhance purchasing confidence.	
X_{15}	I would consider the price difference reasonable if the platform can provide more accurate information about offers through big data technology.	
X_{16}	The personalized recommendation service provided by the platform will increase my tolerance of product price fluctuations.	

In this paper, the quantification of each question is based on a five-point scale, and since all questions contain five levels of options ranging from "strongly disagree" to "strongly agree", the size of the evaluation of the level of participation is scored as 2, 4, 6, 8, and 10 points, respectively, according to the lowest to the highest. That is, "strongly disagree" is 2 points, "disagree" is 4 points, "generally" is 6 points, "agree" is 8 points, "agree" is 8 points, "disagree" is 8 points, "agree" is 10 points. The choice of "disagree" is counted as 4 points, "agree" as 6 points, "agree" as 8 points, and "strongly agree" as 10 points [9].

4.2. KMO and Bartlett's Test of Sphericity

In the statistical table of the sample data, the result of KMO is 0.813, which indicates that the sampled data can be analyzed by principal component analysis. Meanwhile, the significance value of Bartlett's test of sphericity is less than 0.05, which indicates that the sample data are statistically significant and can be analyzed by principal component analysis.

Table 4. KMO and Bartlett's test of sphericity

KMO Sampling Suitability Measure		0.813
Bartlett's test of sphericity	Approximate chi-square	27973.380
	df	151
	P-value	0.000

4.3. Principal Component Factor Analysis

The above questions in this questionnaire can reflect the size of the respondents' willingness to accept big data "killing", but because the dimensionality of the index system of the issues involved is too high, so it is necessary to use principal component analysis to reduce the dimensionality of the system.

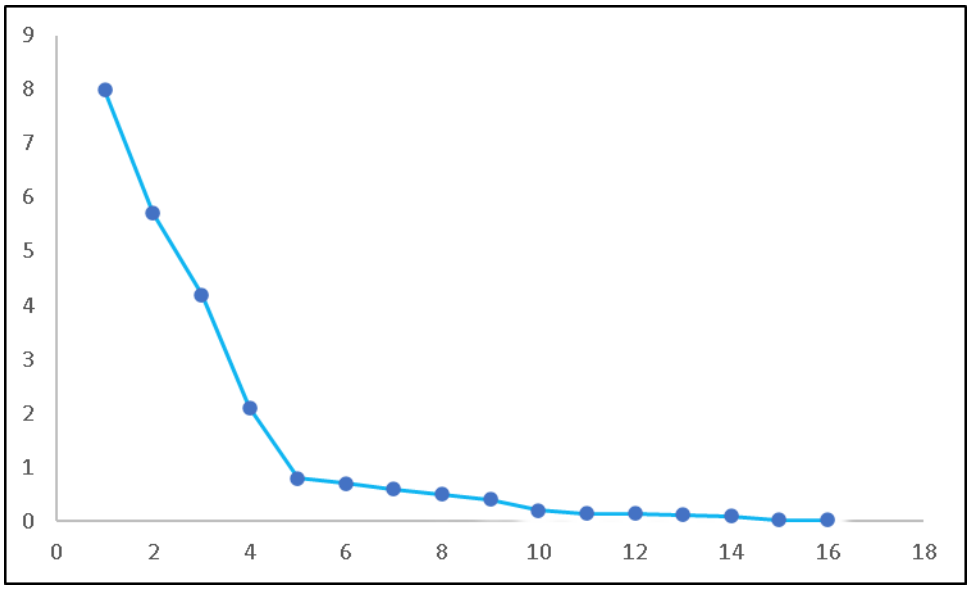

Figure 2. Principal component analysis eigenvalue gravel plot

According to Figure 2, four principal components with eigenvalues greater than 1 are selected in this paper, and their cumulative contribution rate is 78.39%, i.e., the four principal components cover more than 78.39% of the data information of the 16 indicators. After calculation, the principal component loading matrix is obtained as follows Table 5.

Table 5. Principal component loading matrix (PCLM)

Variants	Principal component			
	1	2	3	4
X_1	0.804	0.174	0.370	0.156
X_2	0.793	0.179	-0.231	-0.110
X_3	-0.064	0.004	-0.046	0.726
X_4	0.662	0.212	0.478	-0.122
X_5	0.759	-0.159	-0.170	0.194
X_6	-0.127	0.755	-0.252	0.138
X_7	0.220	0.024	0.703	0.121
X_8	0.352	-0.033	0.862	-0.113
X_9	-0.013	-0.076	0.711	-0.494
X_{10}	0.340	0.748	0.129	0.153
X_{11}	-0.257	0.376	0.300	0.681
X_{12}	0.173	-0.047	-0.109	0.807
X_{13}	0.097	-0.059	-0.112	0.813
X_{14}	-0.220	0.766	0.085	0.115
X_{15}	-0.040	0.697	-0.013	-0.136
X_{16}	-0.162	0.860	0.493	-0.175

Note: The purple grid is the first principal component variable loadings; the red grid is the second principal component variable loadings; the green grid is the third principal component variable loadings; and the yellow grid is the fourth principal component variable loadings [10].

4.4. Conclusion

Let the four principal components of perceived norms, avoidance attitudes, subjective norms, and policy trust be Y_1, Y_2, Y_3, Y_4, whose corresponding eigenvalues are 7.89, 5.62, 4.12, and 2.14, respectively, and standardize $X_1 \rightarrow X_{16}$ to obtain the following score expression.

$$Y_1 = 0.286X_1 + 0.282X_2 - 0.023X_3 + 0.236X_4 + 0.270X_5 - 0.045X_6 + 0.078X_7 + 0.125X_8 - 0.005X_9 + 0.121X_{10} - 0.091X_{11} - 0.062X_{12} + 0.035X_{13} - 0.078X_{14} - 0.014X_{15} - 0.058X_{16} \quad (1)$$

$$Y_2 = 0.073X_1 + 0.076X_2 + 0.002X_3 + 0.089X_4 - 0.067X_5 + 0.318X_6 + 0.010X_7 - 0.014X_8 - 0.032X_9 + 0.316X_{10} + 0.159X_{11} - 0.020X_{12} - 0.025X_{13} + 0.323X_{14} + 0.294X_{15} + 0.363X_{16} \quad (2)$$

$$Y_3 = 0.182X_1 - 0.114X_2 - 0.023X_3 + 0.235X_4 - 0.084X_5 - 0.124X_6 + 0.346X_7 + 0.425X_8 + 0.350X_9 + 0.064X_{10} + 0.148X_{11} - 0.054X_{12} - 0.055X_{13} + 0.042X_{14} - 0.006X_{15} + 0.243X_{16} \quad (3)$$

$$Y_4 = 0.107X_1 - 0.075X_2 + 0.496X_3 - 0.083X_4 + 0.133X_5 + 0.094X_6 + 0.083X_7 - 0.077X_8 - 0.338X_9 + 0.105X_{10} + 0.466X_{11} + 0.552X_{12} + 0.556X_{13} + 0.097X_{14} - 0.093X_{15} - 0.120X_{16} \quad (4)$$

After calculating the above four principal components using the values of the quantified variables, the variance contribution rate of each principal component is used as the weight to derive a

comprehensive evaluation index of the respondents' willingness to accept the behavior of big data "killing":

$$F = 0.3128Y_1 + 0.2228Y_2 + 0.1634Y_3 + 0.0849Y_4 \quad (5)$$

Through the residents of the new mode of big data “kill” the acceptance of the willingness to comprehensive evaluation index of the collected sample data to do the evaluation of the degree of acceptance, calculated the acceptance of the respondents willingness to comprehensive evaluation scores, the use of SPSS data statistics, to obtain the acceptance of the willingness to distribution chart shown in Figure 3.

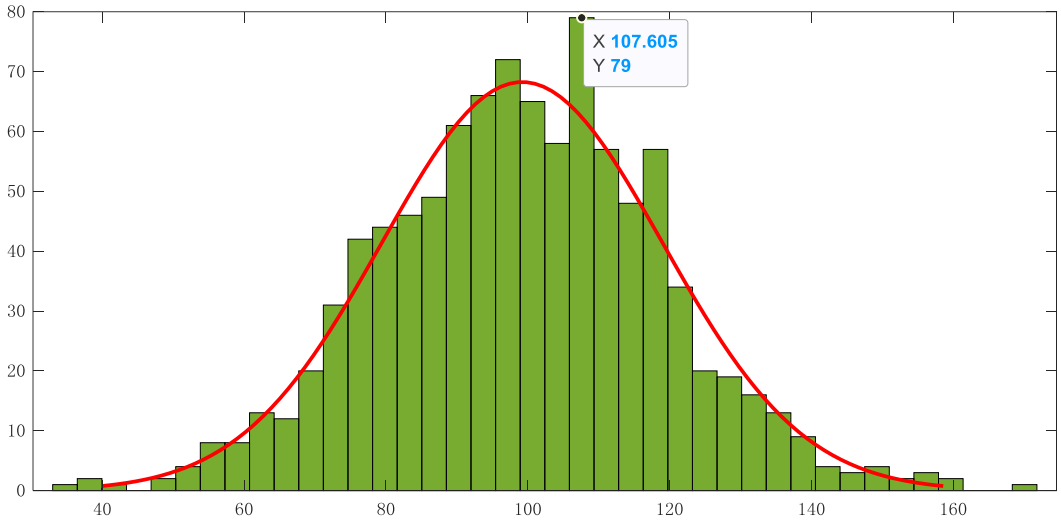

Figure 3. Distribution of Consumers' Acceptance of Big Data “Killing”

Through the comprehensive evaluation of the four dimensions of perceived norms, avoidance attitudes, subjective norms, and policy trust as shown in Figure 3, it is found that the degree of consumers' perception of big data kills presents a normal distribution trend, and the majority of the respondents' scores of perceived willingness are higher than 80, which are basically located in the range of about 80-120, i.e., the consumers with a higher perception willingness account for a majority of the main body, and the respondent groups with a lower perception willingness (scores in the range of 40-80 points or so) account for a relatively small proportion of the interviewed group. The study found that consumers have a certain degree of acceptance of the big data avoidance policy, and it is more likely that the current big data technology, big data avoidance and other related concepts will continue to be popularized and developed and perceived by the majority of consumers.

5. CONCLUSION

This paper explores the cognitive characteristics of different types of consumers on big data kills through K-means clustering method, analyzes the influence factors of big data kills on consumer behavior through principal component analysis, and extracts the four principal components of perceived norms, avoidance attitudes, subjective norms, and policy trust, and finds that consumers have a certain degree of acceptance of the policy of big data kills avoidance, and the current big data technology, big data The current big data technology, big data kill maturity and other related concepts are more likely to be continued popularization and development and be perceived by the majority of consumers.

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REFERENCES

[1] Gao Fuping, Wang Yuan. Why does big data “kill maturity”? [N]. Shanghai Rule of Law News, 2018.

[2] Zhan Hao, Shao Jintian, Huang Zhiwei. “Big data kills maturity”: conceptual clarification and solution [J]. Software, 2019(08).

[3] Bai Shizhen, Xu Wenhu, Jiang Man. Research on the collaborative governance of big data “ripening” behavior of e-commerce platform - Based on the analysis of tripartite evolutionary game of e-commerce enterprises, consumers and government [J]. Price Theory and Practice, 2022(12).

[4] Yu Min. Can “big data kill familiarization” be avoided? --E-commerce adverse selection risk avoidance [J]. Price theory and practice, 2019(04).

[5] Zhu Jianhai. Theoretical Evidence and Path Optimization of Antitrust Regulation of “Big Data Killing Cooking” [J]. Journal of Northwest University for Nationalities (Philosophy and Social Science Edition), 2021(05).

[6] Zou Kailiang, Liu Jiaming. The dilemma and way out of the legal regulation of big data “kill familiarization” - only from the perspective of the Consumer Rights and Interests Protection Law [J]. Price theory and practice, 2018(08).

[7] Wang Jiaqi. The legal response to big data “killing maturity” [N]. People's Court News, 2019-06-11(002).

[8] Tao Runsheng. Research on the impact of information consumption on enterprise performance under the perspective of IT capability [D]. Zhejiang Normal University, 2019.

[9] Ge Liang, Lang Jiangtao, Tang Huang, Tang Yunheng. PCA-Hubness clustering method for high-dimensional data [J]. Modern Computer (Professional Edition), 2017, (11): 52-55+59.

[10] Liu Zijie. Paid user group portrait under the perspective of knowledge economy [J]. Cooperative Economy and Technology, 2020, (12): 78-79.