

Influence of Personalized Marketing on Zhejiang Consumer Satisfaction for Environmental Protection Enterprises under AI Technology

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Abstract

Collecting and analyzing data is an invaluable tool for businesses in the environmental industry to develop effective marketing strategies. Through data collection, businesses can gain critical insights into the behavior and preferences of eco-conscious consumers. This includes metrics such as purchase history, website activity, social media interactions, and other relevant data. This information allows businesses to create highly personalized marketing campaigns catering to eco-conscious consumers' unique needs and interests. Businesses can better serve customers and build long-lasting relationships by leveraging personalized marketing strategies for eco-friendly products and services. Therefore, it is recommended that businesses in the environmental industry use data to create targeted marketing campaigns that resonate with their eco-conscious customers. The number of respondents for this study was 395. The results of this study show that Zhejiang consumer satisfaction with AI personalized marketing in environmental protection purchases would be impacted by their consumer experience, consumer engagement, and personalized advantage.

Keywords : *Personalized Marketing, Environmental Protection Enterprises, AI Technology*

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INTRODUCTION

For decades, marketers have researched the best strategies to create effective campaigns to meet changing consumer preferences. Artificial intelligence hyper-personalization is marketers' latest weapon in China. Traditional marketing strategies rely on broad consumer segmentation, which facilitates reaching larger groups. However, this approach is not optimal for understanding individual needs (Kurolov, 2023). Marketers have also successfully experimented with personalization techniques based on historical consumer data. The needs of modern consumers are constantly changing. Therefore, a more precise approach to individual needs is needed. Today, marketers can use artificial intelligence and data-driven technology based on machine learning to take their marketing strategies to the next level through hyper-personalization (Mahakal, 2023). AI hyper-personalization or AI-driven hyper-personalization is an advanced form of personalized marketing strategy that uses real-time data and personal journey mapping along with artificial intelligence, big data analytics, and automation to deliver highly contextualized offers to the right people and customized content, products, or services that connect users to the right channel at the right time (Mohieldin, 2022). Real-time customer data is integral to hyper-personalization as AI uses this information to learn behavior, predict user behavior, and cater to their needs and preferences. A significant aspect of enterprise AI is its ability to tackle high-value, complex challenges at a large scale, like automating simpler workloads, enhancing product offerings, aiding customers in

decision-making, offering personalized user experiences, solving intricate business problems, and helping reduce waste relating to environmental issues (Kumar et al., 2019).

1. This study aims to explore consumers' satisfaction with personalized marketing from environmental protection enterprises using AI technology. The study has two objectives:
2. To investigate the factors influencing consumer satisfaction of environmental protection enterprises in Zhejiang. The study will focus on consumer experience, consumer engagement, and personalized advantage with personalized AI marketing.
3. To recommend feasible solutions for environmental protection enterprises to enhance consumers' satisfaction and value perception by improving their attitudes and expectations in response to personalized AI marketing strategies.

Thus, the study, conducted with meticulous scientific rigor, aims to ascertain the impact of three independent variables-consumer experience, consumer engagement, and personalized advantage-on the dependent variable of consumer satisfaction.

THEORITICAL FOUNDATION

Equity Theory (ET)

Equity Theory was based on social science and psychology theories: Social Exchange Theory, Social Comparison Theory, and the Theory of Cognitive Dissonance. The equity theory in customer satisfaction suggests that customers expect consistency between what they were promised and received (Nasse & Sawadogo, 2019). This consistency plays a crucial role in delivering a positive customer experience. By managing expectations and consistently exceeding them, businesses can develop a sense of goodwill and trust with their customers (Ross & Kapitan., 2018). This leads to higher levels of customer satisfaction. Equity theory in customer satisfaction applies to all purchases and revolves around the customer's expectations of the product or service and what they expect from the brand. When a customer decides to purchase, the seller must ensure that the experience matches the promises made. If not, the customer feels cheated and dissatisfied with the purchase. This theory applies to all types of consumer experiences and is characterized by factors such as perception, beliefs, and attitudes. Maintaining and improving customer equity is equally important for businesses as it directly impacts profit and revenue (Arvanitis & Hantzi., 2016).

Value Percept Theory

The Value-Percept Theory is a widely accepted organizational psychology theory that suggests an individual's job satisfaction is based on their perception of the value they receive from their job (Bryan & Locke., 1967). According to the theory, job satisfaction is determined by how an individual perceives rewards relative to their effort. The Value-Percept Theory is also relevant to customer satisfaction, as it explains why customers may switch brands, experience trial product failure, or purchase different services based on their initial perceptions. The Value-Percept Disparity theory explains why consumers may value some brands, products, and services more than others, even when the latter have higher expected value (Allen, 2019). The Value-Percept theory explains customer satisfaction by focusing on two factors related to customer perception of value: Actual Value and Ideal Value. Actual Value is a product's actual quality or performance that a customer perceives. In contrast, Ideal value is the "ideal" quality or performance of a product that a customer expects before purchasing the product. The influencing variable of consumer engagement relates to this theory due to social presence, perceived usefulness, and subjective norms in consumer satisfaction (Farkas, 2013).

Comparison Level Theory

The comparison level theory is a marketing concept that highlights how consumers assess their level of satisfaction by comparing it to an internal benchmark rather than solely relying on their direct experience with a product or service (Colpaert et al., 2015). This means that satisfaction is not determined by the product or service in isolation but rather in comparison to other available options in the marketplace. This theory suggests that consumers establish a comparison level by considering various product or service aspects, such as quality, price, and features (Kedia et al., 2014). Personal advantage is an influencing factor associated with this theory, as it affects customer interest and unique interaction in consumer satisfaction. Thus, companies need to understand comparison-level theory to cater to the needs of their customers better and improve their overall satisfaction (Lange & Boecker., 2019).

Terms

1. Consumer satisfaction is a crucial concept in marketing, as it is closely related to overall firm performance. Managers consider it a primary objective. This study defines consumer satisfaction as an affective or overall emotional reaction to a service experience (Zhao et al., 2021). Consumer satisfaction is updated after every interaction with the organization. This study also explores how AI technology can help private enterprises improve consumer satisfaction by providing tailored and optimized customer experiences. It provides precise insights and recommendations to enhance overall satisfaction (Moriuchi et al., 2021).
2. Customer experience is a crucial aspect of any company's offering, encompassing many factors. Some factors include customer care quality, advertising, packaging, product and service features, ease of use, and reliability. However, many people responsible for these aspects often fail to consider how their decisions shape customer experience. Even when they think about it, different people may have other ideas about customer experience, and no one in a senior position may oversee everyone's efforts (Johnston et al., 2018). To overcome these challenges, AI-powered marketing can come in handy. By leveraging a database search and a state-of-the-art approach, AI-powered marketing can respond to consumer needs and requests promptly and appropriately. This can help companies improve their customer experience by delivering personalized and relevant solutions to their customers (Kranzbuhler et al., 2018). Moreover, AI-powered marketing can help companies streamline their marketing efforts, reduce costs, and improve efficiency, ultimately leading to better business outcomes.
3. Customer engagement is critical to increasing customer interaction, building competitive advantage, and strengthening loyalty. It is essential to explore ways consumers can generate value throughout product and customer life cycles (Baiyu & Peng., 2018). In recent years, customer engagement in the co-creation of corporate value has gained popularity. Customers can now participate in various value-creation processes such as enterprise design, production, and sales to obtain final products that meet their expectations (Gronroos, 2010). As a result, many companies have begun to prioritize and encourage customer engagement to understand their needs better, enhance customer satisfaction, and create better value for customers. This approach helps to improve corporate competitiveness.
4. Personalized advantage in marketing is a strategy businesses employ to tailor their marketing efforts to individual consumers. Unlike the traditional one-size-fits-all approach, personalized marketing considers a customer's browsing history, purchase behavior, and demographic information to create targeted and relevant marketing messages (Aksoy et al., 2021). This approach includes personalized email greetings, product recommendations, customized landing pages, and social media ads. Personalized marketing aims to create a more engaging and meaningful experience for the customer, leading to increased satisfaction and loyalty (Anshari et al., 2019).

HYPOTHESIS

The Impact of Consumer Experience on Consumer Satisfaction

Customer service and customer satisfaction are two critical components of the overall customer experience, but they are not interchangeable. Customer service refers to a business's actions to help its customers, whereas customer satisfaction is customers' feelings about the service they receive (Syam & Sharma., 2018). Meanwhile, customer experience is how customers perceive and remember a brand based on interactions. While customer service and satisfaction can impact customer experience, they are not enough to create a truly positive and memorable experience. To achieve this, businesses must take a holistic and strategic approach that considers every aspect of their operations and how they affect their customers.

H1. Consumer service does not significantly impact consumer satisfaction in personalized marketing of environmental protection enterprises under AI technology.

The Impact of Consumer Engagement on Consumer Satisfaction

Customers who actively participate and connect with a brand are more likely to be satisfied with their experience. When customers feel valued and involved, their overall experience is enhanced, leading to greater contentment and positive perceptions. Customer engagement is vital in fostering stronger relationships and improving customer loyalty. To build a deep connection with their audience, businesses must go beyond mere transactions and actively engage customers across multiple channels and touchpoints (Zhou et al., 2009).

H2. Consumer engagement does not significantly impact consumer satisfaction in personalized marketing of environmental protection enterprises under AI technology.

The Impact of Personalized Advantage on Consumer Satisfaction

Personalization is an essential factor in satisfying customers in various industries. Studies have shown that personalization tools, such as customized marketing strategies in e-commerce, significantly impact customer satisfaction and trust, ultimately leading to increased loyalty (Gogua & Smirnova., 2020). Age, individualism, and uncertainty avoidance influence customer desires for personalization, which can affect their emotional satisfaction and product evaluations. Additionally, the strategic use of personalization in customer experiences can reduce customer effort and improve overall satisfaction. Personalization can enhance customer satisfaction and loyalty in different business settings (Torricco & Frank., 2019).

H3. Personalized advantage does not significantly impact consumer satisfaction in personalized marketing of environmental protection enterprises under AI technology.

CONCEPTUAL FRAMEWORK

Data is vital in developing effective marketing strategies for personalized marketing in the environmental industry. By collecting and analyzing data on consumer behavior, businesses can gain valuable insights into the preferences and habits of eco-conscious customers. This includes their purchase history, website activity, and social media interactions, among other metrics. With this information, businesses can create highly targeted and personalized marketing campaigns that directly speak to eco-conscious consumers' needs and interests. Personalized marketing strategies for eco-friendly products and services are tailored to eco-conscious consumers' specific needs and interests. Such strategies focus on creating marketing campaigns highlighting a product's or service's environmental benefits and how it aligns with the customer's values and interests.

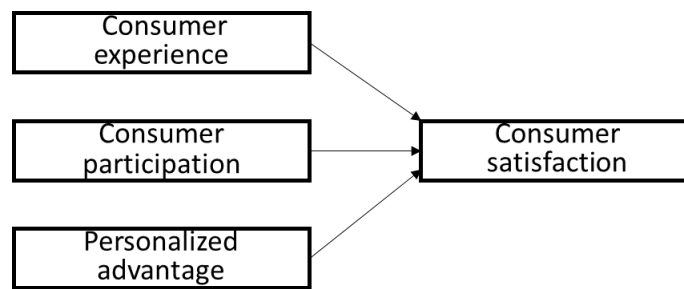


Figure 1. The Conceptual Framework

RESEARCH METHODS

Population and Sample

The research population for this study consists of individuals residing in Zhejiang, China, who express their contentment with AI-powered environmental protection companies. The data set, consisting of 395 responses, was gathered in January 2024 through the WeChat Survey Platform in China and used for analysis.

This study's minimum research sample size is based on the following formula, which is widely accepted for analysis (Pourhoseingholi et al., 2013).

- The margin of error (confidence interval) – 95%
- Standard deviation 0,5
- 95% - Z Score = 1,96
- Sample size formula = $(Z\text{-score})^2 * Std\ Dev * (1 - StdDev) / (\text{margin of error})^2$
- $(1,96)^2 * 0,5(0,5) / (0,05)^2$
- $(3,8416 * 0,25) / 0,0025$
- $0,9604 / 0,0025 = 384$
- 384 respondents would be needed for this study based on a confidence level of 95%

Correlation Analysis

Correlation analysis is a widely used method for examining the relationship between variables. The Pearson correlation coefficient is used to test the degree of correlation. The value of the correlation coefficient, represented by 'r,' indicates the strength of the correlation between variables, while the P-value shows the significance level of the correlation.

Table 1. Correlation Coefficient Classification

Correlation coefficient r	Degree of relevance
$ r = 1$	Totally correlated
$0.70 \leq r < 0.99$	Highly correlated
$0.40 \leq r < 0.69$	Moderately correlated
$0.10 \leq r < 0.39$	Low correlation
$ r < 0.10$	Weak or unrelated

Regression Analysis

Regression analysis is a statistical technique used to examine the relationship between a hypothesis's multiple independent variables and a set of dependent variables. It helps to measure the strength of the relationships between the variables and predicts future relationships between

them. This study used the statistical software SPSS20.0 to perform tests such as the correlation coefficient of determination, multiple linear regression, and hypothesis testing.

RESULT AND DISCUSSION

Correlation Analysis of Consumer Experience and Consumer Satisfaction

The correlation coefficient r between consumer experience and consumer satisfaction is 0,816, and $P=0,01$ is less than 0,01. Thus, it shows that consumer experience is significantly correlated with consumer satisfaction.

Table 2. Correlation analysis results between consumer experience and consumer satisfaction

	Consumer experience
Consumer satisfaction Sig. (1-tailed)	1
Consumer engagement Sig. (2-tailed)	.816** (.001)

Correlation Analysis of Consumer Engagement and Consumer Satisfaction

The correlation coefficient r between consumer engagement and consumer satisfaction is 0,825, and $P=0,001$ is less than 0,01. Thus, it shows that consumer engagement is significantly correlated with consumer satisfaction.

Table 3. Correlation analysis results between consumer engagement and consumer satisfaction

	Consumer engagement
Consumer satisfaction Sig. (1-tailed)	1
Consumer engagement Sig. (2-tailed)	.825** (.001)

Correlation Analysis of Consumer Satisfaction and Consumer Satisfaction

The correlation coefficient r between personalized advantage and consumer satisfaction is 0,805, and $P=0,002$ is less than 0,01. Thus, it shows that personalized advantage is significantly correlated with consumer satisfaction.

Table 4. Correlation analysis results between personalized advantage and consumer satisfaction

	Personalized advantage
Consumer satisfaction Sig. (1-tailed)	1
Consumer engagement Sig. (2-tailed)	.805** (.002)

Regression analysis of various variables on consumer satisfaction

The summary of the model is as follows: R=0,955, R²=0,948, and the adjusted R² is 0,951. This indicates that the model can explain 95,1% of the degree of correlation between consumer experience, consumer engagement, personalized advantage, and consumer satisfaction. The Durbin-Watson test result is 1,996≈2, which shows that the residuals are independent. Therefore, the model does not have any serial correlation problems.

Table 5. Summary of the regression analysis model of constructs and consumer satisfaction

Model	R	R ²	Adjust R Square	Standard estimate error	Durbin-Watson
1	0.955a	0.948	0.951	0.87793	1.996

The results of the single-factor analysis. The regression sum of squares is 5223,413, the residual sum is 227,366, and the significance is 0,000, less than the significance level of 0,01. This study has significant differences between the independent and dependent variables. A considerable effect exists between consumer experience, consumer engagement, personalized advantage, and consumer satisfaction.

Table 6. ANOVAa

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5223.413	3	3378.435	4421.265**	.000 ^c
Residual	227.366	391	.668		
Total	5450.779d	394			

** p ≤ .01

- a. Dependent variable: Consumer satisfaction
- b. Predictor variables: Consumer experience, consumer engagement, and personalized advantage

Table 7. Multiple Linear Regression Analysis Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.332	1.443		4.336	.035
	Consumer experience	.135	.016	.155	1.226	.022
	Consumer engagement	.257	.018	.276	1.356	.000
	Personalized advantage	.442	.025	.469	3.227	.014

*p≤0.05

- a. Dependent Variable: Consumer satisfaction
- b. Predictor variables: Consumer experience, consumer engagement, and personalized advantage

The regression equation of the multiple linear regression analysis

$$Y = \alpha + \beta X_1 + \beta X_2 + \beta X_3 + e$$

$$Y = 3,332 + 0,135 X_1 + 0,257 X_2 + 0,442 X_3$$

Description:

Y = Consumer satisfaction

α = Constant

X1 = Consumer experience

X2 = Consumer engagement

X3 = Personalized advantage

e = Error

β_1 = First Regression Coefficient Number

β_2 = Second Regression Coefficient Number

β_3 = Third Regression Coefficient Number

The coefficient table shows the consumer experience, consumer engagement, personalized advantage, and consumer satisfaction after adding constants to the inequality. It can be concluded that there is a significant influence between these levels.

Interpretation of Research Results

The study aims to explore the correlation between Zhejiang consumers' experience, engagement, and personalized advantage with environmental protection enterprises that utilize AI technology in personal marketing and examine how these independent variables impact the dependent variable of consumer satisfaction.

The Effect of Consumer Experience on Consumer Satisfaction

The result of testing the first hypothesis indicates that consumer experience significantly impacts consumer satisfaction with personalized marketing using AI technology based on the standard regression coefficient of the economic level, which is 0,135, $t=1,226$, and the significance level is $0,022 < 0,05$. It shows that consumer experience significantly impacts consumer satisfaction.

H1. Consumer satisfaction significantly impacts consumer satisfaction in personalized marketing of environmental protection enterprises under AI technology.

The Effect of Consumer Engagement on Consumer Satisfaction

The result of testing the second hypothesis indicates that consumer engagement significantly impacts consumer satisfaction with personalized marketing using AI technology based on the standard regression coefficient of emotional level is 0,257, $t=1,356$, and the significance level is $0,000 < 0,01$. It shows that consumer engagement significantly impacts consumer satisfaction.

H2. Consumer engagement significantly impacts consumer satisfaction in personalized marketing of environmental protection enterprises under AI technology.

The Effect of Personalized Advantage on Consumer Satisfaction

The result of testing the third hypothesis indicates that personalized advantage significantly impacts consumer satisfaction with personalized marketing using AI technology based on the standard regression coefficient of personal level is 0,442, $t=3,227$, and the significance level is $0,014 < 0,05$. It shows that personalized advantage significantly impacts consumer satisfaction.

H3. Personalized advantage significantly impacts consumer satisfaction in personalized marketing of environmental protection enterprises under AI technology.

CONCLUSIONS

The research study concluded that consumer experience, consumer engagement, and personalized advantage significantly impact consumer satisfaction for Zhejiang consumers in personalized marketing with AI technology in environmental protection enterprises. The results

showed that all three influencing variables experienced by Zhejiang consumers proved crucial to developing satisfaction toward AI personalized marketing in environmental protection sectors. In today's digital environment, businesses constantly explore new ways to connect with customers and drive growth. Personalized marketing, a strategy that tailors marketing messages and experiences to individual consumers, has become a powerful tool. Personalized marketing is a marketing strategy that tailors marketing messages, offers, and experiences to individual consumers based on their unique preferences, needs, behaviors, and demographics. It involves leveraging data-driven insights and advanced technology to create highly targeted and customized marketing campaigns. Personalization in marketing is the recognition of each customer's uniqueness by customizing products to meet their needs based on their preferences. Personalized marketing uses data-driven insights to understand consumer behavior, preferences, and needs. Businesses constantly seek innovative ways to connect with customers and drive growth. Personalized marketing has become a highly effective strategy for tailoring marketing efforts to meet individual customer preferences and needs.

REFERENCE

- Aksoy, N. C., Kabadayi, E. T., Yilmaz, C., & Alan, A. K. (2021). A typology of personalization practices in marketing in the digital age. *Journal of Marketing Management*, Vol 37(11-12), pp.1091-1122.
- Allen, K. (2019). The Value of Perception. *Philosophy and Phenomenological Research*, Vol 100, pp.633-656.
- Anshari, M., Almunawar, M. N., Lim, S. A., & Al-Mudimigh, A. (2019). Customer relationship management and big data enabled: Personalization & customization of services. *Applied Computing and Informatics*, Vol 15(2), pp.94-101.
- Arvanitis, A., & Hantzi, A. (2016). Equity Theory Ratios as Causal Schemas. *Frontiers in Psychology*, Vol 7. 1257. <https://doi.org/10.3389/fpsyg.2016.01257>.
- Bryan, J. F., & Locke, E. A. (1967). Goal setting as a means of increasing motivation. *Journal of Applied Psychology*, Vol 51(3), pp.274-277. <https://doi.org/10.1037/h0024566>.
- Colpaert, L., Muller, D., Fayant, M. P., & Butera, F. (2015). A mindset of competition versus cooperation moderates the impact of social comparison on self-evaluation. *Frontiers in Psychology*, Vol 6, 1337. <https://doi.org/10.3389/fpsyg.2015.01337>.
- Farkas, K. 2013. ' A Sense of Reality,' in F. Macpherson and D. Platchias eds. *Hallucination: Philosophy and Psychology*. Cambridge, MA: MIT Press. pp.399-415.
- Gogua, M. M., & Smirnova, M. (2020). Revisiting personalization through customer experience journey. *Scispace*, Vol 19, pp.430-460.
- Grönroos, C. (2010). A service perspective on business relationships: The value creation, interaction, and marketing interface. *Industrial Marketing Management*, Vol 40 (2).
- Johnston, W. J., Le, A. N. H., & Cheng, J. M. S. (2018). A meta-analytic review of influence strategies in marketing channel relationships. *Journal of the Academy of Marketing Science*, Vol 46(4), pp.674-702.
- Kedia, G., Mussweiler, T., & Linden, D. E. J. (2014). Brain mechanisms of social comparison and their influence on the reward system. *NeuroReport*, Vol 25(16), pp.1255 -1265.

- Kranzbühler, A., Kleijnen, M. H. P., Morgan, R. E., & Teerling, M.(2018). The multilevel nature of customer experience research: an integrative review and research agenda. *International Journal of Management Reviews*, Vol 20, pp.433–456.
- Kumar, V., Rajan, B., Venkatesan, R., & Lecinski, J. (2019). Understanding the role of artificial intelligence in personalized engagement marketing. *California Management Review*, Vol 61(4), pp.135-155.
- Kurolov, M. (2023). Exploring the Role of Business Intelligence Systems in Digital Healthcare Marketing. *International Journal of Social Science Research and Review*, Vol 6(6), pp.377-383.
- Lange, J., & Boecker, L. (2019). Schadenfreude as a social-functional dominance regulator. *Emotion*, Vol 19(3), pp.489–502. <https://doi.org/10.1037/emo0000454>.
- M. Ross, S. & Kapitan, S. (2018), "Balancing self/collective-interest: equity theory for prosocial consumption," *European Journal of Marketing*, Vol 52 No 3/4, pp. 528-549. <https://doi.org/10.1108/EJM-01-2017-0002>.
- Mahakal, D. (2023). The Impact Of Artificial Intelligence AI in Digital Marketing. *Journal of Global Economy*, Vol 19(2), pp.30-45.
- Mohieldin, T. (2022). Big Data Applications in Digital Marketing. *Journal of Industrial Policy and Technology Management*, Vol 4(2), pp.185-198.
- Moriuchi, E., Landers, V. M., Colton, D., & Hair, N. (2021). Engagement with chatbots versus augmented reality interactive technology in e-commerce. *Journal of Strategic Marketing*, Vol 29(5), pp.375-389. <https://doi.org/10.1080/0965254X.2020.1740766>.
- Nassè, T. B., & Sawadogo, M. Y. (2019). Internal equity and customer relationship management in subsistence markets: a comparative and a qualitative study of three private companies in Burkina Faso. *International Journal of Management & Entrepreneurship Research*, Vol 1(1), pp.42-58.
- Pourhoseingholi, M. et al. (2013). Sample Size Calculation in Medical Studies. *National Library of Medicine*, Vol 6(1), p.14-17.
- Syam, N., & Sharma, A. (2018). Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and artificial intelligence in sales research and practice. *Industrial Marketing Management*, Vol 69, pp.135–146.
- Torrìco, B. C., & Frank, B. C. (2019). Consumer desire to personalize products and services: cultural antecedents and consequences for customer evaluations. *Total Quality Management & Business Excellence*, Vol 30, pp.1-15.
- Wu, B., & Peng, B. (2018). Service-dominant logic, network embedding, and network platform value co-creation: the mediating role of dynamic capabilities. *Research and Development Management*, Vol 30(1), pp.138-150.
- Zhao, H., Yao, X., Liu, Z., & Yang, Q. (2021). Impact of Pricing and Product Information on Consumer Buying Behavior With Customer Satisfaction in a Mediating Role. *Sec. Organizational Psychology*, Vol 12, <https://doi.org/10.3389/fpsyg.2021.720151>.
- Zhou, J., Shin, S. J., Brass, D. J., Choi, J., & Zhang, Z. X. (2009), "Social networks, personal values, and creativity: evidence for curvilinear and interaction effects," *Journal of Applied Psychology*, Vol 94 No 6, pp.1544-1552.