LOGISTICS SERVICE GOVERNANCE IN THE DIGITAL ECONOMY: THE DYNAMICS OF PRICE WAR STRATEGIES IN A DEVELOPING COUNTRY

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Abstract

In the context of the burgeoning digital economy, logistics service providers find themselves at a pivotal crossroads, particularly within developing countries where the market dynamics are rapidly evolving (Chin et al., 2023; Richey et al., 2023). This study delves into the price war phenomenon within the parcel service industry of Thailand and scrutinizes the implications of this competitive strategy. Using a quantitative research approach, this study collected data through an online questionnaire from a convenience sample of 405 participants in Thailand. The data underwent extensive analysis, employing both descriptive statistics to outline basic characteristics and multivariate analysis of variance (MANOVA). The study's results highlighted the considerable influence of multiple factors — gender, age, education, socioeconomic status, income, residential location, logistics capabilities, and access to information — on the formulation and implementation of price war strategies within the market. These insights have the potential to provide valuable guidance to business proprietors, policymakers, and a spectrum of stakeholders. By implementing the recommendations and lessons gleaned from this research, these stakeholders can collectively contribute to the growth of a vibrant and efficient parcel delivery ecosystem, subsequently enhancing overall business competitiveness and elevating service quality for consumers in the continually evolving global marketplace.

Keywords: Price Wars, Parcel Service Providers, Competitive Strategy, Developing Country

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1. INTRODUCTION

In the contemporary era, the phenomenon of globalization has undergone substantial transformation facilitated by the pervasive adoption of the Internet, mobile technologies, and advancements in information and communication technology (ICT). A central aspect of this redefined globalization is the integration of computer systems and cutting-edge ICTs, which have culminated in the establishment of a consolidated global communication network. This network significantly influences the creation of a unified global financial and informational milieu (Limna et al., 2023; Nivornusit et al., 2024). Furthermore, in recent years, developing countries have witnessed a significant transformation in their economies, driven largely by the expansion of the digital economy. Factors such as increased internet penetration, smartphone adoption, and changing consumer behaviour have contributed to the proliferation of electronic commerce (e-commerce) platforms. Hence, consumers in these countries are now accustomed to the convenience of shopping online, accessing a wide array of products from local and international sellers (Li et al., 2020; Rangaswamy et al., 2022; Rong, 2022). The growth of e-commerce, as well as social commerce (s-commerce), has been nothing short of remarkable for businesses in developing countries. Local entrepreneurs and global giants alike have recognized the potential of these emerging markets. These platforms have empowered small businesses to reach a broader customer base, while established brands have extended their reach to previously untapped regions. One critical factor that underpins the success of e-commerce and s-commerce is reliable parcel delivery. Customers have come to expect fast, secure, and cost-effective delivery options for their online purchases. Therefore, the parcel delivery industry plays a pivotal role in facilitating the growth of e-commerce, as well as s-commerce, in developing countries (Asanprakit & Limna, 2023; Parcu et al., 2023; Schwob et al., 2023).

In the current era of intense competition, a company's success relies on its capacity to consistently innovate, streamline its processes, and engage effectively with customers to secure its position and sustainability within the market. Given this challenging business landscape, it is crucial for companies to implement robust marketing strategies aimed at enhancing the competitiveness of their products and services in the global market (Farida & Setiawan, 2022; Limna et al., 2022; Limna, 2023; Sudirjo, 2023). According to Islami et al. (2020) and Kenton (2023), the price war strategy is a competitive tactic where businesses engage in fierce price reductions to gain an advantage in the market. By offering lower prices than their competitors, companies aim to attract more customers and increase their market share. While this approach can lead to short-term benefits for consumers in the form of cost savings, it often squeezes profit margins and can be unsustainable in the long run. Companies may find it challenging to maintain quality and cover their operational costs while participating in a price war. Additionally, price wars can lead to market consolidation, reduced competition, and potential regulatory scrutiny. Thus, businesses must carefully assess the risks and benefits of this strategy before engaging in a price war (Rao, 2000).

In the Thai context, there is a diverse landscape of parcel service providers, ranging from traditional postal services to private courier companies. These providers are constantly innovating to meet the demands of e-commerce businesses and online shoppers. However, the intense competition has given rise to price wars, with companies vying to offer the most attractive rates to their customers. The digital economy is thriving worldwide, and developing countries like Thailand are no exception. With the surge in online shopping and the rapid growth of e-commerce, as well as s-commerce, the demand for efficient and cost-effective parcel delivery services has never been higher. Therefore, this study investigates the phenomenon of price wars among parcel service providers in a developing country, with a particular focus on Thailand, and examines the implications of this competitive strategy. The study's findings may offer valuable insights and guidance to business owners, policymakers, and various stakeholders. By implementing the recommendations and lessons derived from this research, they can collectively contribute to the development of a thriving and efficient parcel delivery ecosystem. This, in turn, will enhance the overall competitiveness of businesses and improve the quality of services for consumers within the ever-evolving global marketplace.

The structure of this paper is as follows. Section 1 provides the introduction, highlighting the study's importance and objectives. Section 2 represents the literature review, providing an extensive examination of existing research. Section 3 explains the methods used for data collection. Section 4 presents the results, showing the outcomes of the study. Section 5 discusses and interprets the results. Section 6 concludes, summarizing the study, noting any limitations, and suggesting areas for future research.

2. LITERATURE REVIEW

Parcel service providers play a crucial and multifaceted role within the contemporary economy and supply chain logistics. Their core responsibility lies in the seamless and reliable transport of packages, and managing complex networks of vehicles, distribution centres, and delivery routes. These providers excel in critical last-mile delivery, ensuring that packages reach recipients' doorsteps efficiently (Schoen et al., 2019; Uzir et al., 2021; Villa et al., 2023). Furthermore, they offer tracking and visibility services, granting customers and supply chain managers real-time insights into package status and location. Their diverse range of delivery options, including express and specialized services, caters to the varied needs of customers. In the era of e-commerce, parcel providers have become indispensable partners, facilitating the delivery of online orders. Additionally, they manage customs and cross-border logistics for international shipping, simplifying complex regulations. With a commitment to environmental responsibility and technological innovation, these providers continue to evolve to meet the demands of a dynamic marketplace, offering not only package delivery but also sustainable practices and advanced technology integration. In sum, parcel service providers are pivotal in ensuring the efficient flow of goods,

supporting businesses, and enhancing customer satisfaction in today's globalized world (Xing et al., 2011; Zhou et al., 2020; Kiba-Janiak et al., 2021).

Rao et al. (2000) and Reinmoeller (2014) argued that the initiation of a price war represents a critical turning point in the competitive dynamics of a market. Such wars begin when one or several firms within an industry decide to substantially reduce their prices, usually with the intent of securing a competitive advantage or increasing their market share. This initial price reduction may set off a cascade effect, prompting competing firms to engage in a continuous cycle of price reductions. The escalation of price wars can be swift, resulting in a situation where numerous companies persistently undercut each other's prices in an effort to attract customers. Several factors can precipitate the onset of a price war, including market saturation, the entry of new competitors, pressures on profitability, and strategic competitive behaviours. Although consumers may benefit from reduced prices in the short term, prolonged price wars can diminish company profits and impair their ability to invest in innovation and enhance product quality. Firms must therefore thoroughly assess the risks and potential outcomes of engaging in a price war, weighing both the immediate and enduring effects of their pricing decisions (Heil & Helsen, 2001; Vlasic et al., 2019; Wu et al., 2020).

Successfully navigating a price war demands a strategic mindset and a commitment to adaptability. In the face of intense price competition, businesses can employ several strategies for success. These include optimizing costs without compromising quality, differentiating products or services, segmenting customers and tailoring pricing strategies, fostering customer loyalty through rewards and personalized experiences, and providing value-added services. Forming strategic alliances, focusing on operational efficiency, and vigilantly monitoring competitors also play pivotal roles. Moreover, maintaining a long-term perspective, communicating the broader value proposition to customers, and exploring diversification opportunities are essential. It is also crucial to operate within legal and ethical boundaries, gather and respond to customer feedback, and continuously seek ways to enhance the customer experience. By implementing these strategies, businesses can not only weather the storm of a price war but also emerge stronger and more resilient in a competitive marketplace (Grewal & Tansuhaj, 2001; Hinterhuber, 2008; Reeves & Deimler, 2012; Dieffenbacher, 2024).

Van Heerde et al. (2008) conducted an analysis of the ramifications of a notable price war within the Dutch grocery sector that commenced in 2003, initiated by the market leader in response to a waning market share. The research focused on evaluating both the immediate and enduring impacts on consumer behaviour, encompassing aspects such as store visits, expenditure patterns, and sensitivity to pricing and price perceptions. Initially, the onset of the price war resulted in a surge in-store visits and consumer spending. However, over time, the average expenditure per visit diminished as consumers diversified their purchases among various retailers. This strategic price reduction significantly increased consumer responsiveness to weekly pricing changes and overall price perceptions, which primarily benefited the initiator of the price war and hard discounters who already had strong price reputations. While the market leader succeeded in stabilizing its market share and its stock price, mid-tier and upscale chains, which had less robust price images, faced adverse effects. These chains experienced heightened sensitivity among consumers regarding their pricing strategies, impacting their competitive positioning adversely.

Krämer et al. (2016) explored the dynamics of "price wars" within the intercity bus market in Germany, identifying three pivotal conditions that delineate such conflicts: firstly, a market entrant such as Megabus introduces aggressive pricing strategies to capture market share; secondly, these aggressive price reductions push prices below profitability levels, particularly impacting established operators; and thirdly, these pricing strategies are supplier-driven rather than being a response to consumer demand. The analysis underscores that pricing decisions in this highly competitive landscape should be framed with both short-term and long-term considerations. In the short term, decisions may leverage the assumption that marginal costs are minimal, potentially justifying further price reductions. However, a sustainable long-term strategy must treat all costs as variable to ensure overall profitability. Furthermore, the study emphasizes the significant effects of price wars on the price image and customer price sensitivity and stresses the necessity for a clear distinction between genuine price wars and ordinary price competition. This distinction is crucial for firms to strategize effectively and avoid detrimental price battles.

Ma et al. (2021) conducted an analysis of the Russia-Saudi Arabia oil price war's effects from March 2020 to April 2020, specifically examining its impact on the global crude oil markets, including West Texas Intermediate, European Brent, and Oman crude. The study unearthed several crucial insights. First, information leakage significantly influenced the repercussions of the price war, shaping market reactions. Second, the effects of the price war and the subsequent truce on the markets were asymmetrical; the negative consequences of information leaks during the onset of the conflict had more enduring effects than the transient positive impacts observed during the truce. Additionally, the study found that the impact on futures markets varied inversely with the futures contracts' time-to-maturity, suggesting that shorter-term contracts were more acutely affected. Specifically, the West Texas Intermediate market experienced significant disruptions due to negative oil prices. The findings indicate that market participants were adept at recognizing and adjusting to these market dynamics, thereby softening the expected adverse impacts of the oil price war.

Based on the existing literature, the hypothesis can be formulated in the following way:

H_0: Demographic factors (gender, age, education, status, income, and residential location) and informational factors (logistics capabilities and access to information) significantly influence the formulation and implementation of price war strategies among parcel service providers in Thailand.

3. RESEARCH METHODOLOGY

This research study employed a quantitative methodology to investigate the behaviours of Thai logistics service users aged 20 years old and older. The demographic focus was deliberately selected to ensure that participants represented a mature user base likely to engage with such services. A convenience sampling technique was employed to facilitate the selection of participants, aiming for broad accessibility and efficiency in data collection. Yamane's formula was used to calculate the sample size. With a significance level set at 0.05, a precision level of ±5%, and a confidence level of 95%, the required minimum number of participants was determined to be 384 (Uakarn et al., 2021). Therefore, the inclusion of 405 participants in the study was considered adequate to yield precise and dependable results while minimizing the risk of skewed data distribution due to the sample size.

The study's data collection process involved the use of an online questionnaire, which was meticulously crafted through a multistep development process. Initially, comprehensive background research was undertaken, involving the review of scholarly papers, articles, books, and credible online resources to gather foundational knowledge and insights relevant to the study's focus. Based on this extensive review, questions were drafted, aiming to accurately capture the necessary data points for analysis. Subsequently, a preliminary version of the questionnaire was subjected to a rigorous evaluation process involving five experts in the field. These experts assessed the questionnaire to determine its item-objective congruence (IOC) index, a metric used to measure the relevance and clarity of each question. The minimum acceptable IOC score was set at 0.50, as established by Kraiwanit et al. (2023) and Thetlek et al. (2023). Remarkably, the questionnaire for this study achieved IOC values ranging from 0.80 to 1.00, demonstrating that the questions were highly appropriate and well-constructed in terms of their context, and structural coherence.

To enhance the instrument's reliability, a pilot test was administered to 30 individuals outside the main sample, involving the calculation of the Cronbach's alpha coefficient to assess the questionnaire's internal consistency. According to Aithal and Aithal (2020), a Cronbach's alpha coefficient of at least 0.70 is deemed acceptable for research purposes. The questionnaire in this study demonstrated robust reliability with an alpha value of 0.895, surpassing the requisite threshold. Subsequent to these preparatory steps, the finalized questionnaire was disseminated through various online platforms such as WhatsApp, LINE, and X. Before participation, respondents were explicitly asked to grant permission for their responses to be used in the research publication, ensuring ethical compliance and respect for participant autonomy; those who did not consent were given the option to opt-out, thereby maintaining ethical standards and participant rights throughout the research process.

The data collected were subjected to a thorough analytical process, which included both descriptive and inferential statistical methods to extract meaningful insights. Initially, descriptive statistics such as percentages, means, and standard deviations were applied. These statistics served to summarize the data effectively, providing a clear overview of the distribution of variables within the dataset. Percentages elucidated the proportions within categorical data, while means and standard deviations offered insights into the central tendencies and variability of continuous variables. Following the preliminary analysis, a more sophisticated statistical method, the multivariate analysis of variance (MANOVA), was employed. According to Tabachnick and Fidell (2011), MANOVA is a robust statistical technique that enables the examination of multiple dependent variables simultaneously while controlling for any interdependencies and correlations among them. This approach allows for a nuanced analysis of the data, identifying patterns and relationships that might not be apparent when variables are considered in isolation. By integrating both descriptive statistics and MANOVA, the analysis provided a comprehensive view of the data, enhancing the study's depth and the accuracy of its findings. This holistic approach to data analysis ensured a robust examination of the complex interrelations among the variables studied, contributing significantly to the overall validity and reliability of the research outcomes.

4. RESULTS

A dataset from 405 Thai participants was gathered through diligently completed online questionnaires. After collection, the data was methodically coded and rigorously analysed to meet the research objectives and ensure alignment with the study's goals. The data are presented in the tables below.

Table 1. Box's test of equality of covariance matrices

Box's M	*F-statistic*	*df1*	*df2*	*p-value*
99.897	1.018	75	2602.493	0.437

*Note: Tests H_0 that the observed covariance matrices of the dependent variables are equal across groups. Design: Intercept +Gender *Age * Education * Status * Income *Resident * Logistics * Information.*

As shown in Table 1, Box's M, with a value of 99.897, suggests some degree of difference in covariance matrices, but it is not substantial enough to conclude inequality. Similarly, an F-statistic of 1.018 supports this conclusion, as it indicates that the variances between groups are not significantly different from the variances within groups. The 75 degrees of freedom associated with between-group variation (df1) imply a structured source of variability among the groups. However, the fractional df2 value of 2602.493 suggests potential variations in the sizes or shapes of covariance matrices, likely due to differences in sample sizes or covariance structures, warranting further investigation. The p-value of 0.437 exceeds the conventional significance level, further supporting the notion that there is no strong evidence to reject H_0.

Table 2. Multivariate tests

Effect		*Value*	*F-statistic*	*Hypothesis df*	*Error df*	*p-value*
Intercept	Pillai's trace	0.929	2935.575a	2.000	447.000	0.000
	Wilk's lambda	0.071	2935.575a	2.000	447.000	0.000
	Hotelling's trace	13.135	2935.575a	2.000	447.000	0.000
	Roy's largest root	13.135	2935.575a	2.000	447.000	0.000
Gender * Age * Education * Status * Income * Resident * Logistics * Information	Pillai's trace	1.144	2.649	452.000	896.000	0.000
	Wilk's lambda	0.181	2.671a	452.000	894.000	0.000
	Hotelling's trace	2.729	2.692	452.000	892.000	0.000
	Roy's largest root	1.621	3.213b	226.000	448.000	0.000

*Note: Exact statistic. The statistic is an upper bound on the F-statistic that yields a lower bound on the significance level. Design: Intercept + Gender * Age * Education * Status * Income * Resident * Logistics * Information.*

As detailed in Table 2 of the study, the findings indicate that the overall model, incorporating the interaction of various independent variables — *gender, age, education, socioeconomic status, income, residential location, logistics capabilities,* and *access to information* — significantly influences the dependent variables under investigation. The statistical significance of this model is confirmed by several multivariate tests: Pillai's trace, Wilk's lambda, Hotelling's trace, and Roy's largest root, all of which yield significant results at the 0.05 significance level. This robust set of tests strengthens the validity of the model, demonstrating the complex interplay of these factors in impacting outcomes within the context studied.

Table 3. Tests of between-subjects effects

Source	*Price war strategies*	*Type III sum of squares*	*df*	*Mean square*	*F-statistic*	*p-value*
Corrected model	Minimum	519.761a	226	2.300	2.319	0.000
	Free	554.070b	226	2.452	2.240	0.000
Intercept	Minimum	5569.472	1	5569.472	5617.069	0.000
	Free	5675.742	1	5675.742	5186.480	0.000
Gender * Age * Education * Status * Income * Resident * Logistics * Information	Minimum	519.716	226	2.300	2.319	0.000
	Free	554.070	226	2.452	2.240	0.000
Error	Minimum	444.204	448	2.300		
	Free	490.262	448	2.452		
Total	Minimum	9842.000	675	0.992		
	Free	10112.000	675	1.094		
Corrected total	Minimum	963.920	674			
	Free	1044.332	674			

Note: R-squared = 0.539 (Adjusted R-squared = 0.307); R-squared = 0.531 (Adjusted R-squared = 0.294).

Table 3 demonstrates that the collective influence of *gender, age, education, socioeconomic status, income, residential location, logistics*, and *access to information* has a significant impact on *price war strategies*, achieving statistical significance at the 0.05 level. The R-squared value reported at 0.539 suggests that these variables account for approximately 53.9% of the variance in *price war strategies*. This substantial proportion indicates that over half of the variability in the dependent variable — *price war strategies* — is explained by these demographic and informational factors, highlighting their critical role in shaping pricing strategies within the market. Consequently, the model exhibits a reasonably strong fit, effectively capturing the dynamics that influence pricing decisions in the context studied.

5. DISCUSSION

This study investigated the phenomenon of price wars among parcel service providers in Thailand and examined the implications of this competitive strategy. Several factors, namely gender, age, education, status, income, resident location, logistics, and access to information, collectively exert a notable influence on the formulation and execution of price war strategies. Gender can impact how individuals perceive and respond to pricing strategies. For example, certain pricing tactics may resonate differently with men and women due to varying consumer preferences or behaviours. In accordance with the research conducted by Shaengchart and Kraiwanit (2023), the influence of the Starlink satellite project on Internet provider services can be characterized in terms of gender. Specifically, their findings indicate that the impact of the Starlink satellite project on Internet provider services was particularly significant among male users. Furthermore, age can be a significant determinant of pricing strategy effectiveness. Different age groups may have distinct purchasing behaviours and price sensitivity levels, influencing the choice of pricing strategies. Consistent with the research conducted by Shaengchart et al. (2023), the impacts of the Starlink project on the competitive landscape of the Internet service provider market in Thailand can be elucidated by considering age as a significant influencing factor. In addition, variations in education levels can influence consumers' comprehension of pricing structures and their capacity to assess pricing strategies. This, in turn, may impact their reactions during price wars. This observation aligns with the study findings of Kraiwanit et al. (2023), which revealed a positive correlation between education levels and the intention to use the Worldcoin wallet in Thailand. Moreover, socioeconomic and social status can play a role in the impact of the pricing strategy. Individuals with different status levels may have varying degrees of price sensitivity and willingness to engage in price wars. The study's results aligning with the research conducted by Han et al. (2010), indicate that social status can affect willingness to pay, especially for status-signaling goods. Consumers with

higher social status or those aspiring to higher status may be willing to pay premium prices for products that reinforce or elevate their perceived status. Income levels directly influence purchasing power and price sensitivity. Higher-income individuals may respond differently to price wars compared to those with lower incomes. In accordance with the research conducted by Shaengchart et al. (2023), the effects of the Starlink project on the competitive dynamics within the Internet service provider market in Thailand are best comprehended when considering the variable of income as a focal point. Geographic location can impact market dynamics and consumer behaviour. Urban and rural residents may have different responses to price wars due to variations in lifestyle and needs. This is consistent with a study by Jangjarat et al. (2023) which revealed that the multiple regression model highlighted a variable, residence, which exhibited a positive inverse relationship with the social economy. The logistics of a business, including supply chain efficiency and cost management, can influence its ability to engage in and sustain price wars. Effective logistics can provide a competitive advantage in pricing strategies. Satranarakun and Kraiwanit (2023) propose several strategies to improve transportation services, particularly in the metro rail sector. They suggest utilizing social networks for advertising and promotions, with a focus on potential customers who can afford transportation but may not be using the services. Additionally, they recommend collaboration between metro rail systems, community organizations, and advocates to create programs addressing the needs of vulnerable populations while ensuring universal access to public transportation. Ultimately, the authors emphasize the importance of prioritizing affordability and accessibility for all individuals through metro rail accessibility laws and regulations. Last but not least, the availability of information and consumer knowledge can profoundly shape individuals' reactions to pricing strategies. In our contemporary digital era, consumers frequently possess a wealth of information, and this can influence how they respond to shifts in prices. This observation is in harmony with a study conducted by Thetlek et al. (2023), which underscores a positive correlation between factors such as obtaining investment news through various media sources — be it mass media, online platforms, or print media — and their impact on the tokenization for investment in Thailand.

6. CONCLUSION

This study delves into the intricate dynamics of price wars within the parcel service industry of a developing nation, focusing on Thailand to unravel the nuances of this competitive strategy. The findings of this rigorous investigation illuminate the profound influence exerted by a constellation of factors on the orchestration and implementation of price war tactics. These factors — encompassing gender, age, education, socioeconomic status, income, residential location, logistics, and access to information — emerge as pivotal shapers of consumer behaviour, subsequently casting a significant shadow on the outcomes of price wars within the industry.

When these factors are considered collectively, they command a significant and statistically verifiable influence over the formulation and actualization of price war strategies. It becomes imperative for both corporate entities and policymakers to intricately incorporate these dimensions into the genesis and deployment of their pricing frameworks. The nuanced understanding and strategic integration of elements such as gender, age, education, socioeconomic standing, income, the geographic mosaic of residential locations, the arteries of logistics, and the lifelines of information accessibility are paramount. These variables, by virtue of their ability to sculpt consumer behaviour, wield a substantial impact on the tides and eventual standings of price wars in the commercial arena.

A meticulous comprehension and astute amalgamation of these variables stand as the cornerstones for sculpting pricing strategies that resonate with the variegated tapestry of consumer needs and preferences while ensuring a business's competitive stature in the marketplace. By acknowledging and adapting to the complex interplay of these factors and their influence on market behaviour, businesses can craft pricing strategies that are not only resilient and competitive but are also in harmony with the evolving contours of consumer dynamics and market competition. This study, by shedding light on these critical factors, aims to offer actionable insights and guidance to business proprietors, policymakers, and a spectrum of stakeholders. In harnessing the wisdom distilled from this research, these stakeholders are poised to collectively cultivate a thriving and efficient parcel delivery ecosystem, thereby amplifying business competitiveness and elevating service quality for consumers in the dynamic global marketplace.

The study recognizes certain limitations, notably the use of convenience sampling, which may introduce sampling bias and constrain the representativeness of the sample. It also acknowledges that the findings are specific to Thailand and may not be directly applicable to other regions. To address these limitations and enhance future research, the study recommends employing more diverse and representative sampling methods, conducting cross-country comparative studies, and exploring the influence of regulatory frameworks and emerging technologies on the parcel service industry. Additionally, qualitative research methods, such as interviews, could complement quantitative findings by investigating stakeholder motivations and perceptions. Furthermore, a particularly valuable extension of this research would be to investigate similar trends in other developing countries to identify both commonalities and variances. Addressing these identified limitations and implementing the proposed suggestions are crucial steps toward gaining a more comprehensive understanding of price wars within the parcel service sector, ultimately benefiting industry competitiveness and consumer satisfaction.

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