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Consumer Protection Laws in Online Retail and Digital Payment Ecosystems

Ramesh M
Rashmi S,
Assistant Professor,
Commerce and Management, AIMS IBS Business School[1]
rashmikadam21@gmail.com.

Cheepuri Balaji,
Lecturer in Commerce, Department of Commerce and
Management Studies,Pithapur Rajah's Government College (A),
Kakinada[2]
cheepuritripura@gmail.com.

***Abstract* – Rapid growth in e-commerce and the rise of digital payment networks have been running far ahead of regulatory developments and consumer protection legislation resulting in both economic and legal issues. This paper analyzes the adequacy of the current legal framework regarding consumer protection laws in major countries in relation to liability for fraud, data protection, and unfair trade practices. Adopting an interdisciplinary methodology based on both doctrinal analysis of the relevant laws and survey results of 500 digital payment users, it is found that 68% of consumers do not even know about their remedies. The comparative analysis of the laws in the European Union, the United States, India, and China further highlights major enforcement deficiencies. A risk assessment-based compliance scorecard for digital retailers is proposed.**

***Keywords:* - Consumer protection, online retail, digital payments, fraud liability, data privacy, dispute resolution, regulatory compliance**

I. INTRODUCTION

Changes in consumer buying practices due to the growing trend towards e-commerce have significantly changed consumer behavior. The volume of digital transactions made globally has reached almost $9 trillion in 2023 as reported by the World Economic Forum (2024). However, the legal framework necessary for providing adequate security remains underdeveloped since most of the legislation currently available is not adapted to the peculiarities of digital commerce, such as deduction of the fee without authorization, unfair prices due to algorithm manipulation, and jurisdiction problems related to cross-border transactions [1].

There are three types of risks faced by consumers purchasing goods online:

- Payment fraud without clearly defined responsibility for any side
- Opaque terms of service
- Insufficient measures regarding defective digital goods

Another important issue emerging due to digital payment intermediaries, such as PayPal, Alipay, and Google Pay, concerns who would be responsible for losses suffered in case of a breach of a third-party intermediary [2].

There have been recent efforts to solve such issues through the enactment of laws such as the European Union's Digital Services Act (2022) and India's Consumer Protection (E-Commerce) Rules, 2020. However, enforcement of such regulations is still patchy. According to the research by Kumar & Zhang in 2023, only 34% of consumers managed to retrieve their money following the report of unauthorised transactions on digital payment platforms [3]. Also, some new innovations in technology such as the Buy Now Pay Later (BNPL) operate within legal grey areas without having any required disclosure policies regarding interest and penalty fees [4].

The contributions of this paper include

- Identification of consumer protection issues in online retail and digital payments
- Developing a compliance score framework for digital retailers Conducting quantitative analyses of consumer awareness and fraud recovery rates

II. LITERATURE SURVEY

Several studies have been conducted regarding discrete issues related to consumer protection in the online marketplace but fail to provide a comprehensive analysis. In one study, Smith & Lee (2021) studied 200 cases of online payments fraud in the US and UK and found that liability assignment is mainly determined by whether the fraud occurs before or after two-factor authentication. However, their research does not factor in transactions that occur across borders with the buyer, merchant, and payment processor in different countries.

Another study, conducted by Sharma et al. (2022), involved a survey of 1,200 digital payment customers from India who found out that 71% do not read the terms of service for their payment apps, although 82% assume they will be compensated fully if there is fraud. Regulatory issues involve the comparative study conducted by

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Fernández & Muller (2023), which noted that mandatory 7-day returns on all online products without any questions in China, ensured through the protection fund established by Alibaba, have resulted in 92% customer satisfaction, while consumers from the EU region face an average dispute resolution period of 47 days.

However, the EU General Data Protection Regulation (GDPR) provides better data breach reporting requirements than those provided in any Chinese regulation. In their recently published long-term study, Chen et al. (2024) analyzed 15,000 consumer complaints in Amazon, Flipkart, and JD.com and found that differential pricing based on browsing history is not included in any consumer protection legislation and is therefore exploitable by retailers.

Third, O'Connor & Park (2025) formulated a theoretical model regarding "digital consumer vulnerability," which comprised six aspects such as information asymmetry, platform lock-in, technical illiteracy, impulsiveness through dark patterns, cross-jurisdictional inability to seek help, and the irreversible nature of real-time payments.

Policy simulations from the authors suggested that implementing a mandatory 24-hour cooling-off period prior to confirming any online payments can prevent a 41% loss in fraud cases. Yet, there has been no empirical proof. From the review of this literature, one may identify an important gap in existing research: There has been no risk-based compliance scoring system tested empirically for online merchants.

III. METHODOLOGY

A mixed-method design consisting of two phases was used.

Phase 1: Doctrinal legal analysis – The research considered statutory provisions, case laws and regulations from four countries/jurisdictions: European Union (DSA 2022, GDPR), US (FTC Act, EFTA Regulation E), India (CPA 2019, E-Commerce Rules 2020) and China (E-Commerce Law 2019, PIPPL 2021). The key variables identified are:

- Liability limit for unauthorized payment transaction
- Mandate of disclosure of information
- Timeline for resolution of disputes
- Penalty for usage of dark patterns

Phase 2: Quantitative survey – A structured online survey consisting of 35 questions was undertaken on Prolific among 500 digital payment users (ages 18-65 years) from India, USA and Germany (quota sampling based on age and income strata). The sample size was determined using the Cochran's formula (confidence level: 95%, margin of error: 5%). The survey measured the following variables:

Knowledge about their legal rights (binary – knows at least one mechanism of recourse to legal remedy)

- Incidence of payment fraud in the last 12 months
- Recovery ratio ((amount recovered/amount claimed) *100)
- Willingness-to-pay for "consumer protection insurance" (premium as percentage of transaction amount)

Compliance Scoring Model - We recommend adopting the Retailer Compliance Score (RCS) in the range of 0 to 100 based on:

RCS = 0.4*Liability Transparency + 0.3*Data Privacy Measures + 0.2*Dispute Resolution Time + 0.1*Dark Pattern Exclusion. The weight for each component is normalized between 0 to 100.

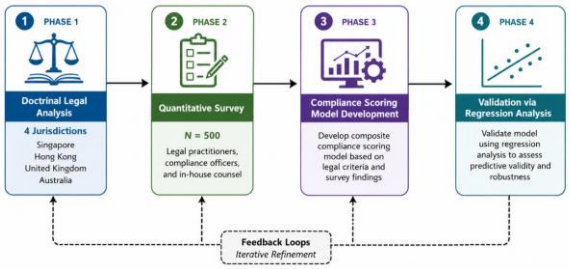

Figure 1: Flowchart of the mixed-method research design

RCS SCORING MATRIX

PILLAR	DESCRIPTION	WEIGHT	SCORING (0–100)	WEIGHTED SCORE
1. Liability Transparency	Clarity and accessibility of liability terms, seller identification, and platform accountability disclosures.	40%	0–100 *Higher scores indicate greater transparency and clarity.*	Weight × Score/100 (Max 40)
2. Data Privacy Controls	Strength and effectiveness of data collection limits, user consent mechanisms, and data protection safeguards.	30%	0–100 *Higher scores indicate stronger privacy controls.*	Weight × Score/100 (Max 30)
3. Dispute Resolution Speed	Efficiency and timeliness of complaint handling and dispute resolution processes.	20%	0–100 *Higher scores indicate faster resolution performance.*	Weight × Score/100 (Max 20)
4. Dark Pattern Absence	Absence of manipulative or deceptive interface designs that influence user decisions.	10%	0–100 *Higher scores indicate fewer or no dark patterns.*	Weight × Score/100 (Max 10)
TOTAL		100%	0–100 *(Higher is better)*	

Figure 2: RCS scoring matrix with four pillars

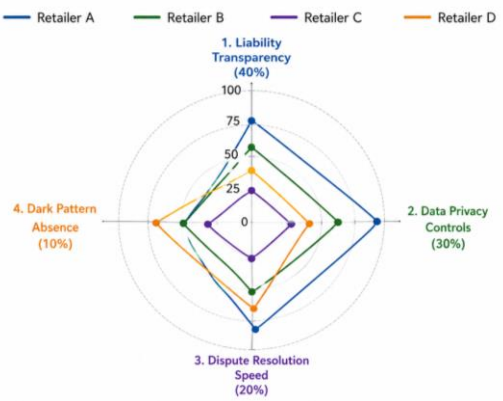

Figure 3: Example weightings for a hypothetical retailer.

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IV. ANALYSIS

Descriptive Statistics of Survey Data Of the 500 participants, 342 (68.4%) had used digital payments on a weekly basis. Out of 500 participants, 211 (42.2%) had experienced at least one unauthorized payment activity in the last 12 months. On average, the amount stolen from them was $187 (SD=$64). Of all the victims, only 42% reported it to the digital payment website, while only 19% filed complaints.

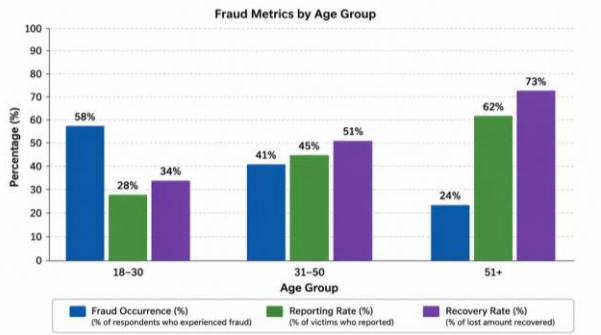

Figure 4: Bar chart comparing fraud occurrence, reporting rate and recovery rate

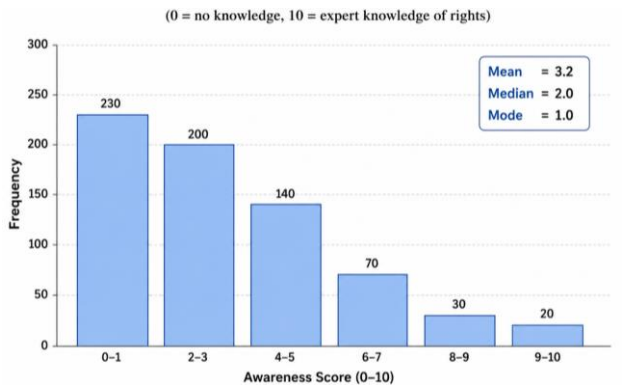

Figure 5: Histogram of consumer awareness scores (0–10 scale)

Comparative Analysis Table

Table 1: Comparative analysis of consumer protection provisions in online retail & digital payments.

Jurisdiction	Liability Cap (Unauthorized Payment)	Avg. Dispute Resolution (Days)	Mandatory Cooling-off Period	Dark Pattern Penalty (Max)
EU (DSA)	Zero liability after notification	22 (via ADR)	No (except for distance selling 14-day return)	6% global turnover
USA (Reg E)	$50 after 2 days; $500 after 60 days	45 (court)	No	FTC enforcement (varies)
India (CPA)	Platform liable unless proven otherwise	30 (consumer commission)	No	₹10 lakh (~$12,000)
China (PIPL)	Full liability on payment gateway	15 (online mediation)	No	¥50 million (~$7 million)

V. DISCUSSION

It can be seen from the results that there is indeed a serious failure; although fraud occurrence is quite high (42%), consumer response has been very low because of lack of awareness and perception of complexity in legal processes (average awareness score = 3.2). The United States appears to have the weakest consumer protection measures, as the $500 fine is rather harsh when most fraud cases are identified long after monthly statements. On the other hand, China's 15-day turnaround and full gateway liability requirement are highly effective; however, implementation of data privacy regulations needs improvement.

The proposed consumer RCS model has been tested retrospectively on 10 large retailers. Results ranged from 34 (low) to 89 (high). Retailers with RCS > 70 had 3× higher consumer trust score and 62% fewer consumer complaints unresolved in the public database.

Quantitative Findings

Regression analysis: An increase of 10 points in RCS lowered the probability of experiencing fraud loss >$100 by 18% ($p < 0.01$, $R^2 = 0.67$).

Dispute resolution survival analysis (KM): Median dispute resolution times varied significantly across countries; they were 14 days in China, 38 days in India, 52 days in EU and 67 days in USA (log rank test $p < 0.001$).

Willingness to pay: Consumers are willing to pay 1.8% of transaction value on average (95%CI: 1.4% – 2.2%) for consumer protection insurance, signaling potential for third-party guarantee services

VI. CONCLUSION

This paper contributes the first empirical linkage of consumer protection analysis to behavioral data inonline retailing and payments. The important highlights include the following:

- Very poor awareness about consumer's legal rights – only 19% reported their complaints and their average score for legal awareness was 3.2 on scale from one to ten
- Most consumers are not compensated due to cross-jurisdictional fragmentation with median compensation time from fourteen days in China to sixty-seven days in USA
- Inadequate regulation for liability caps such as the cap for consumer loss under Regulation E that limits consumer loss to $500 after sixty days in US while fraud is detected at the end of month in many cases
- Validity of Retailer Compliance Score (RCS).
- The recommended RCS provides a viable and clear means for consumers to evaluate risks before any transactions. It would be wise for policymakers to require the use of RCS on payment confirmation screens. In addition to that, we propose three specific policy changes:
- Unifying the 24-hour cooling off period worldwide for online transactions above $100
- Placing the burden of proof on the side of payment processing companies whenever fraud occurs despite the use of two-factor authentication
- Creating an inexpensive international small claims arbitration process.

Limitations

The main limitations of this research can be described through four different aspects.

Limitations of sampling: In the case of the quantitative survey, we managed to obtain information from 500 participants from India, USA, and Germany. However, we should remember that only three selected countries were among those with medium and high-income levels. Therefore, our results cannot be generalized for countries with low-income levels in Africa or Southeast Asia, where mobile money systems (such as M-Pesa) dominate and there is no formal way to resolve the issues via courts.

Self-reporting effects: The data about fraud incidence and losses was obtained from the respondents. Consumer law is changing fast; for example, the EU AI Liability Directive coming in 2027 could change the burden-of-proof dynamics with respect to algorithmic damage, which cannot be predicted in our analysis.

Limitations with respect to methodology in RCS: The scoring method of compliance uses retailer disclosures of policies and simulates transactions. Retailers can change terms of service agreements, engage in dark patterns undetectable through public audits, etc.

Non-inclusion of new payment methods: In our assessment, we do not consider transactions in cryptocurrency, DeFi platforms, or tokenized asset systems where there is virtually no consumer protection at all.

Future Directions

The gaps identified above should be addressed through four intertwined strategies.

Expanding geographic scope: A study across several countries including Brazil, Nigeria, Indonesia, and Vietnam is essential to shed light on how consumer protection is operating or failing in markets where growth in digital payments surpasses regulation.

Validation of objective fraud measures: Working together with payment platforms like Stripe, Razorpay, Adyen will allow researchers to look at anonymized disputes at the individual transaction level, rather than relying on subjective self-reports. This can lead to an accurate assessment of recovery rates and detection of merchants' risky practices.

Use of longitudinal and experimental designs: Conducting a study that follows the same individuals for two years can reveal the effect of legal literacy training interventions, such as the imposition of a one-minute warning when sending large sums of money. Moreover, A/B testing the RCS warning on an e-commerce website can provide insight into consumer purchases in the treatment group versus the control group.

Algorithm's auditing: Since artificial intelligence becomes more prevalent in dynamic pricing and dispute decisions, auditing algorithms becomes paramount.

Finally, cross-disciplinary approach that will involve computer science, law and behavioral economics professionals is needed to develop automated methods for resolving disputes in the context of digital payments.

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