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DIGITAL TRANSFORMATION OF CONSUMER LENDING IN ROMANIA: E-COMMERCE INTEGRATION, ELECTRONIC SIGNATURES, AND THE GENERATIONAL SHIFT IN FINANCIAL SERVICES

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Abstract

The digitization of consumer lending represents one of the most consequential structural transformations in retail financial services over the past decade. This paper examines the digital transformation of consumer credit in Romania, with particular attention to e-commerce-embedded financing, electronic signatures, automated credit scoring, and the behavioral shift driven by successive generational cohorts. Drawing on updated empirical data from Eurostat, the National Bank of Romania (BNR), the European Commission, and industry sources for 2020–2025, alongside a detailed case-study analysis of a digital consumer financing implementation at a leading Romanian non-bank financial institution, the paper maps the structural evolution from paper-based, courier-dependent credit origination to fully digital, real-time approval workflows. Key findings: Romania's e-commerce market reached approximately €7 billion in 2023 (CAGR >10%); internet banking penetration reached 30.97% in 2025; COVID-19 generated approximately 3.4 million new digital users in Romania; and e-signature workflows reduced time-to-finance from 14 days to under 24 hours, generating a projected ROA of 9–13.5%. In the context of eIDAS 2.0 (effective May 2024) and Law 214/2024, the paper argues that digital consumer lending is no longer a strategic option but a structural imperative.

Keywords: Digital banking; Consumer lending; E-commerce financing; Electronic signatures; BNPL; Romania

INTRODUCTION

The convergence of digital technology, changing consumer demographics, and a rapidly expanding e-commerce ecosystem has fundamentally altered the architecture of retail financial services across Central and Eastern Europe (CEE). Romania, as one of the region's largest economies and fastest-growing digital markets, sits at the intersection of these transformative forces. Yet its banking sector — historically characterized by high physical-branch density, paper-intensive processes, and conservative credit eligibility criteria — has been slow to adapt to the pace of digital change demanded by its increasingly connected population.

The tension between institutional inertia and digital disruption is particularly acute in the consumer credit segment. Traditional consumer lending in Romania required borrowers to submit physical documentation, undergo courier-dependent contract processes lasting up to 14 days, and interface with branch-based or telephone sales teams. Meanwhile, a new cohort of digitally native consumers — Millennials and Generation Z, now constituting the majority of the economically active population — expects instantaneous, mobile-first credit decisions integrated seamlessly into their e-commerce purchasing journeys.

This paper investigates how Romanian financial institutions have navigated this structural transformation, using the case of an online consumer financing implementation at a Romanian subsidiary of a major European financial group as its primary analytical lens. The case captures three analytically distinct dimensions: (i) the redesign of the credit origination process through e-signature adoption and real-time ANAF (fiscal authority) integration; (ii) the commercial logic of e-commerce-embedded financing in a double-digit-growth retail market; and (iii) the financial sustainability of digital lending models under multiple demand scenarios, including the COVID-19 stress period.

The paper makes four contributions. First, it provides an updated empirical characterization of Romania's digital financial services ecosystem for 2020–2025. Second, it develops a process-level analysis of e-signature implementation in the Romanian regulatory context, with particular attention to eIDAS 2.0 and Law 214/2024. Third, it analyzes the financial performance of digital consumer lending under base, best, and worst-case scenarios. Fourth, it situates Romanian digital consumer lending within the global shift toward Buy Now Pay Later (BNPL) and embedded finance models.

LITERATURE REVIEW

Digital Transformation in Retail Banking: Theoretical Foundations

The literature on digital transformation in banking draws on multiple theoretical traditions. Christensen's (1997) theory of disruptive innovation provides the foundational framework:

digital-first financial entrants (FinTechs, neobanks) enter the market by targeting overserved or underserved segments with simplified, lower-cost products, progressively moving upmarket to challenge incumbents on their core offerings. The application of this framework to banking is well established (King, 2019; Skinner, 2020).

Complementary to the disruption thesis is the literature on platform economics in financial services. Rochet and Tirole (2003) characterize financial intermediaries as two-sided platforms connecting borrowers and lenders; digital technologies fundamentally alter the economics of such platforms by reducing matching costs, information asymmetry, and transaction friction. E-commerce-embedded consumer lending is a direct instantiation of platform economics in consumer credit. Alt and Puschmann (2012) characterize digital lending as the 'datafication' of credit, arguing that competitive advantage derives from information architecture rather than capital.

Generational Shifts and Banking Behavior

The literature on generational cohorts in financial services (Twenge, 2017; Deloitte, 2024) identifies three dimensions along which Millennials (born 1980–1994) and Generation Z (born 1995–2012) differ systematically from older cohorts: (i) platform preference — strong preference for mobile-first, app-based interfaces; (ii) trust architecture — lower institutional trust in traditional banks, higher trust in technology-led brands; and (iii) financial product preference — preference for embedded, contextual financial products (BNPL, instant loans) over standalone credit products.

Empirical evidence is substantial: Deloitte (2024) documents that 99% of Gen Z consumers use a mobile banking app, with an average login frequency of 21 times per month. PYMNTS (2024) finds 85% of Gen Z and 82% of Millennials prefer contactless digital payments. McKinsey (2021) finds that 52% of European consumers aged 25–34 are turning to retail brands rather than traditional banks for financial services. In Romania, these global trends are amplified by demographic concentration in urban digital environments.

E-Commerce Financing, BNPL, and Embedded Credit

The theoretical literature on embedded finance (Barbesino et al., 2022) conceptualizes the shift from standalone financial products to contextually integrated financial services within non-financial platforms. The business logic rests on three mechanisms: (i) borrower acquisition cost is radically reduced by leveraging the retailer's existing customer base; (ii) credit risk is partially informed by purchase intent and transaction history; and (iii) financing offers directly increase average basket size — evidence from Romania indicates installment-based purchases

generate average cart values approximately three times higher than equivalent cash purchases (ElevatePay, 2024).

The BNPL model represents the most recent evolution of this paradigm. The European BNPL market was valued at USD 2.69 billion in 2023, with a projected CAGR of 11.5% through 2030 (NextMSC, 2024). Globally, the BNPL market reached approximately USD 560 billion in gross merchandise volume in 2025. In Romania, TBI Bank pioneered BNPL with retailer Flanco in 2018, establishing the first local proof of concept.

Electronic Signatures and KYC Digitalization

The regulatory literature on electronic signatures in consumer lending focuses on three intersecting regimes: eIDAS (EU Regulation 910/2014); AML/KYC requirements under the AMLD series; and national consumer credit legislation. Lironi (2021) and van Eecke (2020) document the progressive relaxation of the tension between eIDAS enablement and AML verification robustness through video-KYC and biometric verification. The adoption of eIDAS 2.0 (effective May 2024) and Romania's Law 214/2024 on electronic signatures has significantly deepened this regulatory enablement, creating a clear legal hierarchy for different signature types and mandating EUDI Wallet availability by 2026.

METHODOLOGY

This paper employs a mixed-methods design combining macro-level market analysis with a micro-level process and financial case study. The macro-level analysis draws on secondary data from Eurostat's Digital Economy and Society Survey (DESI) for 2024; the BNR interactive statistical database for consumer credit aggregates through 2025; GPeC e-commerce industry reports; McKinsey's Digital Challengers series for CEE; and Statista / DataReportal digital indicators for Romania.

The case-study component draws on primary documentation from a digital consumer financing implementation at a Romanian IFN (non-bank financial institution) subsidiary of a major European financial group, covering the period 2013–2020. The case provides process-level data on as-is and to-be credit origination flows, pre-scoring scorecard design, stakeholder architecture, CAPEX/OPEX investment parameters, and financial performance under three scenarios. Where internal data is referenced, it is treated as representative of market-level practice, consistent with case-study research ethics. The financial scenario analysis updates key parameters (cost of funds, digital origination share, average issued value) to reflect the 2024/2025 market environment.

ROMANIA'S DIGITAL FINANCIAL SERVICES LANDSCAPE (2020–2025)

Internet Penetration and Digital Infrastructure

Romania's digital infrastructure has undergone rapid development over the past decade. As of early 2024, Romania counted 18.06 million internet users at 91.6% penetration, rising to 94.57% by December 2024 (Eurostat, 2024). Daily internet usage in the Nord-Est region increased by 33.9 percentage points between 2019 and 2024, reaching 83.3%, demonstrating geographic broadening of digital connectivity. A structural gap persists on the business side: Romania shares the lowest business e-commerce adoption among EU member states at only 13% of businesses selling online — creating friction that e-commerce-embedded lending models are positioned to address.

The E-Commerce Market

Romania's e-commerce sector has been among the fastest-growing in Europe, reaching approximately €7 billion by end-2023, representing approximately 10% year-on-year growth over €6.3 billion in 2022 (GPeC, 2023). In USD terms, the market reached approximately $7.46 billion in 2024, with forecasts projecting $11.65 billion by 2030 at a 7.81% CAGR (MarkWide Research, 2025). The number of e-commerce users is projected to reach approximately 10.7 million by 2025 — more than half the Romanian population.

Table 1. Romania e-commerce market — key indicators, 2019–2025.

Indicator	2019	2022	2023	2024E	2025F
Market value (€bn)	~3.5	~6.3	~7.0	~7.8	~8.5
E-commerce users (M)	~7.8	~9.2	~9.8	~10.2	~10.7
E-commerce penetration	~35%	~47%	~55%	~57%	~60%
YoY market growth (approx.)	~30%	~15%	~11%	~11%	~9%

Source: GPeC (2023); MarkWide Research (2025); Statista (2025); Eurostat (2023).

Digital Banking Adoption

Romania's digital banking adoption has lagged relative to its internet penetration level. The share of individuals using the internet for banking reached 30.97% in 2025 (Eurostat/TradingEconomics, 2025), placing Romania in the lower tier of EU member states and significantly below the EU average of approximately 58%. This adoption gap has been narrowing rapidly: Revolut has built a Romanian user base exceeding 3 million as of 2023, with Bucharest recording the highest per-capita concentration of Revolut users of any EU city (The

Recursive, 2024), demonstrating the latent demand for digital-first financial services that traditional institutions have been slow to capture.

The FinTech Ecosystem

Romania's FinTech sector comprised approximately 23 significant companies generating aggregate revenues of €59.5 million in 2023 — a 21% year-on-year increase — with Bucharest accounting for 77% of total industry turnover (€45.6 million). The top five players generate 83% of sector revenues, reflecting a winner-takes-most dynamic consistent with platform economics (The Recursive, 2024). In the consumer lending space, the critical FinTech capabilities are real-time credit scoring integrating bureau, fiscal, and behavioral data; digital KYC; and e-signature infrastructure.

GENERATIONAL SHIFTS AND CONSUMER BEHAVIOR

The Multi-Cohort Banking Population

Romania's banking population currently spans five living generations, from the Silent Generation through to Generation Alpha. The economically active core is dominated by Generation X (born 1965–1979), Millennials (born 1980–1994), and Generation Z (born 1995–2012), who collectively account for the majority of Romania's working-age population and constitute the primary demand base for consumer credit. The strategic significance lies not in current composition but in trajectory: Millennials and Gen Z are the largest and fastest-growing credit-demand segments, and their banking behavior differs qualitatively — not merely quantitatively — from that of older cohorts.

Digital Banking Preferences by Generation

Table 2. Digital banking preferences by generation, 2024/2025.

Indicator	Gen Z	Millennials	Gen X
Use mobile banking app	99%	98%	~70%
Avg. monthly app logins	21	14	~8
Neobank adoption (2025)	61%	~42%	~18%
Prefer digital payments to cash	85%	82%	~55%
Open account via app (not branch)	72%	~65%	~35%
Rely on technology for finance	Yes	Yes	No

Source: Deloitte (2024); PYMNTS (2024); CoinLaw (2026).

The Expectation of Instantaneity in Consumer Credit

A defining feature of Gen Z and Millennial credit behavior is the expectation of near-instantaneous credit decisions. BNPL providers have set the benchmark: approval in seconds within a checkout flow, requiring no separate application. Against this reference point, a traditional Romanian consumer credit process taking 14 days to disbursement is not merely slow — it is disqualifying for a borrower segment that will choose a faster competitor. McKinsey's research on Romanian retail banking (2022) identifies 'time-to-finance' as the single most influential determinant of digital-channel credit conversion — more influential than pricing within a ±2–3 percentage-point range. This finding elevates the investment case in digital process redesign from operational efficiency to structural competitiveness.

CASE STUDY: DIGITAL CONSUMER CREDIT IMPLEMENTATION

Institutional Context

The case study draws from the experience of a Romanian IFN subsidiary of a major European financial group, specializing in consumer credit products distributed through retail partnerships, direct telephone, and online channels. The institution had issued over 457,000 credit cards in the Romanian market, maintained a total credit outstanding of approximately 1.2 billion RON, and employed over 500 people directly. The parent group — present in over 60 countries with approximately 183,000 employees and 2024 revenues of approximately USD 79.8 billion (BNP Paribas, 2025) — provided a strategic framework within which the Romanian digital implementation was contextualized.

Online credit partnerships were first established in Romania in 2013. Over the subsequent period, the online channel registered average annual growth exceeding 50%. However, the process remained partially analogue: despite digital application front-ends, contract execution required physical documentation and courier delivery, elevating time-to-finance to 8–14 days and generating approximately 30% abandonment rates at the documentation-submission stage.

The As-Is Process: Structural Constraints

The existing process comprised four sequential stages across direct telephone, direct online, and e-commerce partner channels. Stage 1 — Application: automated eligibility check (Expert System call) generating a Green/Orange/Red preliminary score; accepted applications generated a PDF documentation package. Stage 2 — Documentation: the package was dispatched via courier, adding 3–10 business days regardless of scoring outcome. Stage 3 — Manual Granting: physical documentation reviewed by the granting team with manual ANAF

telephone income verification, credit bureau cross-check, and document-completeness validation. Stage 4 — Financing: approval and disbursement only after complete validated physical documentation was received. Total time-to-finance: 8–14 days.

The To-Be Process: Digital Architecture

The redesigned digital process eliminated the physical documentation requirement through three technological components: (i) Automated Database Interrogation — real-time integration with ANAF (income verification), Biroul de Credit (credit bureau), and RECOM (company register), completing three-database eligibility verification in seconds; (ii) Electronic Signature (eSign) — a dedicated Subscription Zone presenting the credit documentation package for electronic signature via three options (SMS-OTP simple signature, advanced AdES signature, or qualified QES), with mandatory consents including ANAF consent captured within the workflow; and (iii) Digital Archiving — secure, auditable electronic document storage enabling instant retrieval.

Table 3. As-is vs. to-be process comparison — digital consumer credit implementation.

Process Stage	As-Is (Physical)	To-Be (Digital)	Impact
Income verification	Manual ANAF phone call (1–3 days)	Real-time ANAF API query (<10 sec)	TTF –3 days
Credit bureau	Manual bureau check (same day)	Automated API (<5 sec)	Capacity freed
Contract signature	Courier dispatch + return (3–10 days)	e-Sign in Subscription Zone (minutes)	TTF –8 days
Document archiving	Physical file storage	Encrypted digital archive	Instant retrieval
Total time-to-finance	8–14 days	<24 hours (target)	~90% reduction
Abandonment rate	~30%	~10% (target)	–20pp

Source: Adapted from case-study primary documentation.

Partner Pre-Scoring Architecture

Parallel to the process redesign, a Partner Pre-Scoring system was developed — a bespoke credit-scoring model calibrated to the purchase and repayment behavior of existing retail-partner clients. The scorecard employed a five-characteristic scoring model calculated on a monthly cycle. The commercial logic was to extend credit-approval access to a wider population of e-commerce customers than accessible through the standard scoring cutoff,

leveraging partner-channel-specific behavioral data not captured in the general credit bureau. Applicants scoring above the partner-channel threshold received immediate e-sign with no manual intervention; intermediate-band applicants entered a manual review queue; below-threshold applicants received automated decline communications.

REGULATORY FRAMEWORK: eIDAS 2.0, LAW 214/2024, AND KYC

The eIDAS 2.0 Framework

eIDAS 2.0 (Regulation (EU) 2024/1183) entered into force on 20 May 2024, significantly expanding the original eIDAS framework through the introduction of the European Digital Identity Wallet (EUDI Wallet). Each EU member state must provide at least one EUDI Wallet to citizens and companies by 2026. For financial institutions, the EUDI Wallet creates new KYC possibilities: wallet-held identity attributes (identity document data, tax identification, address verification) can be shared with lenders by the borrower with a single consent action, eliminating manual document submission entirely.

Romania: Law 214/2024 and ANAF Digital Integration

Romania adopted Law 214/2024 on electronic signature and trust services on 8 July 2024 (entering into force 8 October 2024), establishing a clear legal hierarchy for signature types and implementing eIDAS provisions. For consumer lending, the law resolves ambiguities that previously constrained digital origination, explicitly addressing electronic signatures in financial-services contracts. The ANAF digital consent integration — enabling real-time fiscal income verification — materially improves income-verification accuracy relative to telephone methods, reducing first-generation NPL risk on digitally originated portfolios.

AML/KYC and Video Verification

The most persistent regulatory constraint on fully digital consumer credit origination is the identity-verification requirement under the AMLD series. Video-based KYC, enabled by EBA guidance (2022) and subsequently operationalized in Romanian NBR guidance, allows identity verification via live video interaction with biometric comparison against identity document data. By 2025, multiple Romanian lenders had deployed video-KYC solutions, eliminating the last remaining physical touchpoint in the origination process. The second version of the application described in Section 6 envisaged facial-identification software as the KYC component of a fully end-to-end digital origination flow.

FINANCIAL PERFORMANCE ANALYSIS

Business Assumptions and Revenue Model

The financial model is built on three KPIs: Average Issued Value (AIV), number of daily credits, and total credit volume. The baseline AIV for online credits was 1,800 RON, expected to increase to approximately 2,250 RON post-implementation through reduced abandonment and pre-scoring expansion. CAPEX consisted primarily of IT infrastructure upgrades (core banking system, application front-ends, Subscription Zone, ANAF integration). OPEX increases were driven by four additional FTEs for the transition granting team. Consumer credit revenues are generated through the spread between funding cost and effective portfolio yield (interest plus fees, net of cancellations).

Table 4. Illustrative revenue structure — 2,250 RON digital consumer credit, 33% APR.

Revenue Component	Value (RON)
Average Issued Value (AIV)	2,250
Total interest and fees (credit life)	~742
Impairment provision (IFRS 9 Stage 1)	~135
Net revenue per credit	~607
Funding cost (annualized % of AIV)	~90
Net interest margin per credit	~517

Source: Adapted from case-study primary data; updated for the 2024 cost-of-funds environment.

Scenario Analysis

Three financial scenarios were modeled for the second version of the application (incorporating facial-identification KYC and full e-signature automation). The base case assumes 15% per annum organic volume growth, generating a projected ROA of 9% from Year 3 and NIBT exceeding 600,000 RON — the most probable outcome given historical digital-channel growth data. The best case assumes 50% volume growth from combined pre-scoring, AIV increase, and abandonment reduction, generating 16.5 million RON net income and 8.7 million RON NIBT over the four-year life cycle, reaching the corporate ROA target of 13.5%+. The worst case assumes organic-only growth with delayed KYC deployment, with ROA at or slightly below the 13.5% corporate target. All three scenarios confirm commercial viability — confirming the asymmetric risk profile that makes digital investment straightforward to justify.

Table 5. Financial scenario summary — digital consumer lending project v2.

Scenario	Revenue (4yr, MRON)	NIBT (4yr, MRON)	ROA (Year 3)	Key Driver
Base Case	~12.0	~0.6	~9%	15% organic volume growth
Best Case	~16.5	~8.7	~13.5%+	50% growth + pre-scoring
Worst Case	~9.5	~0.3	~9%−	Organic only, delayed KYC

Source: Adapted from case-study primary data (original internal calculations).

COVID-19 AS A DIGITAL ACCELERANT

Pandemic Impact on Credit Production

The COVID-19 pandemic, declared in March 2020, generated immediate disruption to the Romanian consumer credit market. Physical retail closure caused an 11.14% decline relative to budgeted credit production in March 2020, with Q2 2020 recording the deepest production contraction. Law 17/2020 mandated credit installment cancellation for up to nine months for eligible borrowers, introducing significant liquidity-management challenges. McKinsey projected a potential drop in Romanian banking revenues of approximately RON 58 billion by 2025 relative to a no-pandemic baseline (McKinsey, 2022).

Digital Channel Resilience and Structural Acceleration

Against the backdrop of physical channel closure, the digital consumer credit channel demonstrated structural resilience that the traditional process could not match. During the state of emergency, the online digital flow was the only channel maintaining positive credit-origination activity — directly vindicating the strategic and financial case for digital investment. The broader market data is equally striking: between January and May 2020, the digital economy in CEE grew at more than 14%, capturing 78% of the entire digital growth recorded in all of 2019. Romania contributed approximately 3.4 million new digital users — roughly 30% of all new CEE digital users during this period — with 43% of new digital adopters citing COVID-19 as their primary adoption driver (McKinsey, 2021).

McKinsey's subsequent research on digital-adoption retention in Romania (2021) found that 'thoughtful digitization' — active cultivation of digital customer relationships beyond the transactional context — was the primary determinant of whether pandemic-acquired digital customers were retained. This finding implies that digital lending institutions must design for ongoing digital engagement (refinancing offers, account management, contextual product recommendations) rather than treating digital origination as a one-time acquisition event.

The post-pandemic trajectory confirms a permanent behavioral shift. Internet-banking penetration continued to grow from approximately 22% in 2019 to 30.97% in 2025, and consumer credit regulation was updated: Law 243/2024 capped consumer loan interest rates at 27 percentage points above the BNR policy rate, compressing pricing headroom for high-APR IFN products and reinforcing the commercial logic of digital origination (lower cost-to-serve enabling profitability at more competitive APR points).

BNPL and the Next Frontier of Digital Consumer Lending

Buy Now Pay Later (BNPL) has emerged as the most disruptive product category in consumer credit, with the European market projected to reach USD 6.17 billion by 2030 from USD 2.69 billion in 2023 (CAGR 11.5%). The global BNPL market reached approximately USD 560 billion in gross merchandise volume in 2025 at 13.7% year-on-year growth. BNPL's growth is driven by the same generational and platform dynamics analyzed in Section 5: Gen Z and Millennial consumers prefer installment-based purchase financing with zero visible interest costs, delivered within the e-commerce checkout flow as an invisible background process.

In Romania, TBI Bank's BNPL offering (launched with Flanco in 2018) demonstrated the model's viability and established a first-mover competitive advantage. The July 2024 regulation mandating at least one electronic payment option for all Romanian merchants reinforced BNPL's structural position. Average cart values associated with installment payments are approximately three times higher than upfront payments, providing direct evidence of the commercial uplift that embedded financing generates for retail partners (ElevatePay, 2024).

BNPL poses a structural challenge to traditional IFN consumer credit models: traditional installment credit (paper-heavy origination, explicit APR) is increasingly disadvantaged relative to BNPL in the e-commerce channel, where speed and checkout integration are primary conversion drivers. Institutions that have invested in digital origination infrastructure — ANAF integration, e-signature, automated scoring — hold the technical foundation to extend into BNPL with incremental rather than greenfield investment, provided they build the commercial architecture of merchant partnerships and adapt pricing from borrower-funded to merchant-funded revenue models.

DISCUSSION

First, the investment case for digital lending process redesign is robust across all reasonable financial scenarios. The asymmetric risk profile — limited downside (worst case still achieves near-corporate-target ROA), significant upside (best case exceeds target by a material margin) — makes digital process investment straightforward to justify at board level.

Second, the generational dynamics of Romanian banking demand are irreversible. The 3 million Revolut users, 10.7 million projected e-commerce users, and 30.97% internet-banking penetration are not edge-case figures but the mainstream market. Financial institutions without completed digital-origination transformation by 2027 face structural competitive disadvantage in new borrower acquisition.

Third, the regulatory environment has shifted decisively in favor of digital origination. eIDAS 2.0, Law 214/2024, ANAF digital consent, EBA video-KYC guidance, and the forthcoming EUDI Wallet have collectively eliminated all material regulatory barriers to fully digital consumer credit origination. Institutions not exploiting these enablers are forfeiting a structural competitive advantage.

Fourth, the COVID-19 pandemic permanently accelerated Romania's digital-adoption trajectory. The 3.4 million new digital users generated in five months expanded the addressable market for digital consumer lending by a step-change. The digital channel's demonstrated resilience during physical channel closure provides a validated business-continuity argument for digital investment.

Fifth, BNPL represents the natural evolution of e-commerce-embedded consumer credit and the primary competitive frontier for Romanian IFNs over the 2025–2030 horizon. Existing digital infrastructure — retailer partnerships, checkout integration, real-time scoring — provides the stepping-stone; BNPL requires incremental rather than greenfield investment from institutions that have already made the digital-origination transition.

RECOMMENDATIONS FOR PRACTICE, POLICY, AND ECOSYSTEM PARTNERS

Given the applied, practice-oriented nature of this study, the analysis presented in Sections 6 through 11 is translated below into a structured set of recommendations addressed to the three stakeholder groups shaping Romania's digital consumer-lending trajectory: financial institutions undertaking or planning digital-origination transformation, regulators and policymakers responsible for the enabling framework, and e-commerce/BNPL ecosystem partners. Each recommendation is derived directly from the case-study evidence, financial scenario analysis, regulatory review, and discussion developed earlier in the paper, rather than from generic digital-transformation guidance.

Recommendations for Financial Institutions (Banks and IFNs)

The case-study evidence shows that replacing physical documentation with automated three-database verification (ANAF, Biroul de Credit, RECOM) and electronic signature reduced time-to-finance from 8–14 days to under 24 hours and addressed the approximately 30%

abandonment previously incurred at the documentation-submission stage; institutions still operating paper-based or partially digital origination should treat this redesign as the single highest-return digital investment available to them. Second, the Partner Pre-Scoring model described extended credit access to applicants below the standard bureau cutoff by leveraging partner-channel behavioral data; institutions should extend this architecture to additional retail partners rather than limiting it to the initial deployment, since each additional partner adds addressable volume without a proportional increase in credit risk. Third, the scenario evidence supports a phased investment sequence: fund the base-case digital redesign first, which achieves a projected ROA of approximately 9% from Year 3 at contained CAPEX, and treat facial-recognition/video KYC as a second-phase investment that captures the best-case upside (ROA 13.5%+); the asymmetric risk profile identified — limited downside, material upside — should be used to secure board approval without requiring extended pilot phases. Fourth, institutions that have already built ANAF integration, e-signature, and automated scoring hold the technical foundation to enter BNPL with incremental rather than greenfield investment, provided pricing is adapted from borrower-funded to merchant-funded revenue models to remain viable under the Law 243/2024 interest-rate cap. Fifth, the COVID-19 retention finding — that 'thoughtful digitization' determined whether pandemic-acquired digital customers were retained — implies that digital lenders should design for engagement beyond the point of origination (automated refinancing offers, digital account servicing, contextual product recommendations) rather than treating digital origination as a one-time acquisition event. Finally, institutions should begin EUDI Wallet integration planning now, ahead of the 2026 member-state deployment deadline, to avoid a second wave of KYC re-engineering once wallet-based attribute sharing becomes the market standard.

Recommendations for Regulators and Policymakers

eIDAS 2.0 and Law 214/2024 removed most of the legal ambiguity previously constraining electronic signatures in consumer credit; regulators should build on this by issuing sector-specific technical guidance clarifying which signature tier — SMS-OTP, AdES, or QES — is appropriate for which credit product or value bracket, reducing the cost each institution currently bears in independently interpreting the framework. Second, supervisory authorities should work toward a standardized, interoperable video-KYC certification scheme so that identity verification completed for one institution can be more readily trusted or reused, lowering the duplicated compliance investment documented across the sector. Third, given that the EUDI Wallet's single-consent attribute-sharing model directly extends the digital-origination architecture documented, regulators should prioritize wallet rollout and publish clear integration

APIs and timelines for lenders well ahead of the 2026 deadline. Fourth, the limitation identified in Section — the absence of empirical NPL comparison between digitally and traditionally originated portfolios — points to a concrete policy action: introducing channel-tagged NPL reporting at the credit-bureau or supervisory-reporting level would close this evidence gap and enable macroprudential monitoring of digital-origination credit risk grounded in market-wide data rather than single-institution projections. Finally, regulators should monitor the interaction between the Law 243/2024 interest-rate cap and digital cost-to-serve reductions, since smaller IFNs without the capital to fund digital transformation may otherwise be structurally disadvantaged relative to larger, better-capitalized competitors — an outcome that would reduce rather than increase competitive pressure in the market.

Recommendations for E-Commerce and BNPL Ecosystem Partners

The financial evidence shows that average cart values under installment payment are approximately three times higher than under upfront payment; e-commerce merchants not yet offering checkout-embedded financing should treat this as a direct conversion and basket-size lever rather than a peripheral customer-service feature, and prioritize integration accordingly. Second, since partner-channel behavioral data was the specific mechanism that allowed the Partner Pre-Scoring model to extend credit access beyond the standard bureau cutoff, retail partners should formalize structured, consent-based sharing of purchase and repayment data with lending partners; the arrangement is mutually reinforcing rather than a one-directional data request, since wider credit access at the partner's checkout increases the partner's own conversion. Third, merchants not yet offering embedded credit should evaluate BNPL partnerships now, given the July 2024 mandate requiring at least one electronic payment option and the accelerating shift of consumer-credit demand toward the BNPL format documented; as the TBI Bank–Flanco partnership from 2018 illustrates, early movers established a durable competitive position that later entrants have subsequently had to compete against.

Implementation Priority

The evidence developed supports a three-horizon implementation priority for institutions beginning this transition. In the short term (0–12 months), priority should go to replacing physical documentation with the three-database verification and e-signature architecture described, since this delivers the largest single reduction in time-to-finance and abandonment at the lowest technical complexity. In the medium term (1–3 years), priority shifts to scaling the Partner Pre-Scoring model across additional retail partners and deploying video/facial-recognition KYC to complete the end-to-end digital flow, capturing the incremental ROA upside

identified in the best-case scenario. In the long term (3–5 years), priority shifts to BNPL market entry leveraging the digital infrastructure built in the first two horizons, and to EUDI Wallet integration as the regulatory framework matures toward the 2026 EU-wide deployment deadline. Institutions that treat these as sequential dependencies rather than parallel workstreams are better positioned to fund each phase from the financial returns of the preceding one, consistent with the phased CAPEX/OPEX structure observed in the case study.

CONCLUSIONS

This paper has examined the digital transformation of consumer lending in Romania, integrating updated market data for 2020–2025 with a detailed process and financial case study of a digital consumer credit implementation at a leading Romanian IFN. The central argument — that digital consumer lending is a structural imperative, not a strategic option — is supported by the convergence of generational behavioral change, e-commerce market growth, regulatory enablement, and FinTech competitive pressure.

Key empirical findings include: Romania's e-commerce market reaching approximately €7 billion in 2023 with a 7.81% projected CAGR through 2030; internet banking penetration reaching 30.97% in 2025; COVID-19 generating 3.4 million new digital users in Romania in the first five months of 2020; e-signature and ANAF-integrated workflows reducing time-to-finance from 14 days to under 24 hours; and projected ROA of 9–13.5% across financial scenarios confirming commercial viability.

The regulatory landscape has been transformed by eIDAS 2.0 (May 2024) and Romania's Law 214/2024, creating a clear legal framework for digital origination and establishing the EUDI Wallet as the next-generation KYC infrastructure. The BNPL model, growing at 11.5% CAGR in Europe, represents the product frontier toward which e-commerce-embedded consumer credit is evolving.

LIMITATIONS OF THE STUDY

This study is subject to several limitations that should be considered when interpreting its findings. First, the case-study component draws on a single Romanian IFN subsidiary of one European financial group, covering the 2013–2020 implementation period; the process, pre-scoring, and financial findings therefore reflect the operating conditions of one institution and may not generalize to universal banks, digital-native FinTechs, or IFNs with different ownership structures, product mixes, or risk appetites. Second, internal case-study data — including abandonment rates, time-to-finance figures, and CAPEX/OPEX parameters — were treated as representative of market-level practice consistent with case-study research conventions, but

were not independently verified against other market participants and may embody institution-specific factors not observable to the researcher. Third, the financial scenario analysis (Section 8) is a forward-looking model built on assumed volume-growth, AIV, and cost-of-funds parameters rather than on realized, audited post-implementation financial results; the projected ROA and NIBT figures should accordingly be read as illustrative of commercial viability rather than as confirmed outcomes. Fourth, the study does not include an empirical comparison of non-performing loan (NPL) rates between digitally originated and traditionally originated credit portfolios, so claims about the risk profile of digital origination rest on process-efficiency and volume evidence rather than on realized credit-loss data. Fifth, the macro-level analysis synthesizes secondary data from multiple sources (Eurostat/DESI, BNR, GPeC, Statista, McKinsey) that differ in collection methodology, sample frame, and reference period; while these were selected for their authority and recency, full cross-source comparability cannot be guaranteed. Finally, the study is confined to the Romanian consumer-lending and e-commerce-financing context; while Romania's regulatory trajectory (eIDAS 2.0, Law 214/2024) broadly mirrors EU-wide digitalization trends, country-specific factors — including Romania's comparatively low banking penetration and distinct generational adoption curve — limit the direct transferability of findings to other Central and Eastern European or Western European markets.

SUGGESTIONS FOR FURTHER STUDIES

Future research should examine three open areas. First, the empirical measurement of NPL differentials between digitally originated and traditionally originated consumer credit portfolios in Romania. Second, the competitive dynamics between traditional IFN digital platforms and BNPL-native entrants in the Romanian e-commerce-embedded finance market post-2024. Third, the implications of EUDI Wallet deployment for KYC economics and borrower-onboarding costs across the Romanian financial services sector.

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