Designing a Secure, Transparent Ticket Resale Ecosystem for Puerto Rico

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Quimba

industrial engineering
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DEFINE

Ticket reselling in Puerto Rico is highly fragmented and informal, creating inefficiencies in fraud prevention, data traceability, and royalty management for promoters, producers, and ticket issuers (Microjuris al Día, 2023; iMusician Blog, 2016). The resale process occurs mainly through unregulated channels such as Clasificados Online, Facebook Marketplace, and third-party platforms like SeatGeek, Vivid Seats, and StubHub/Viagogo (Microjuris al Día, 2023). This decentralized system lacks integration with official ticket databases and fails to capture transaction data that could ensure compliance, transparency, and equitable distribution of royalties (Pulitzer Center, 2025; Microjuris al Día, 2023).

The problem has persisted for over a decade, intensifying with the growth of digital ticketing and social media platforms that operate outside regulated market frameworks. As a result, approximately 30% of high-demand event tickets are resold informally, leading promoters and issuers to lose 100% of potential royalties from these transactions (LaMusica.com, 2023; Vivus Hub, 2025; iMusician Blog, 2016). Fraud and counterfeit activity remain common, as duplicated or invalid tickets circulate without verification mechanisms, increasing reputational and financial risk (Primera Hora, 2025; El Nuevo Día, 2025). This lack of control over resale undermines system reliability and public trust across Puerto Rico's live event ecosystem.

Voice of Customer

Questions asked during interviews:

Live event goers:
- How has your experience been when purchasing tickets for an event?
- Can you talk about your last live entertainment experience?
- How do you plan out these types of activities to attend? Why?
- What do you value in attending X-event? Why?
- How much are you willing to pay to attend X-event? Why?
- How has been your experience in obtaining secondary market tickets?

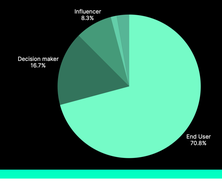
Live event organizers:
- Can you talk about your day-to-day line of work?
- Can you talk bout your beginnings in the industry or how you started working in it?
- Can you define what success means for an event?
- What are some current or past challenges you/or the industry have/has faced?
- How would you address the informal ticket reselling market?

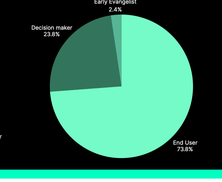
Event Organizers:

Event Organizers	46 conversations
End user	31
Decision maker	10
Influencer	0
Other (Saboteur, Early Evangelist)	1
Total	46

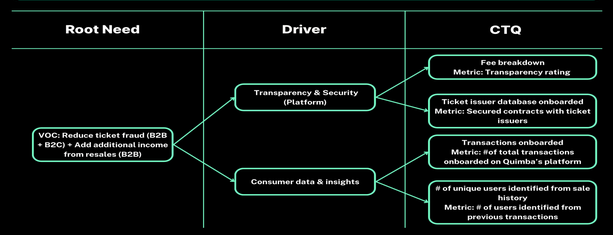
Event Attendees:

Event Attendees	72 conversations
End user	51
Decision maker	12
Influencer	6
Other (Saboteur, Early Evangelist)	3
Total	72

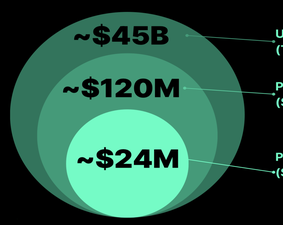




CTQ Tree



Market Overview



US + LATAM Ticketing Market (Total Addressable Market)

PR Ticketing Market (Serviceable Addressable Market)

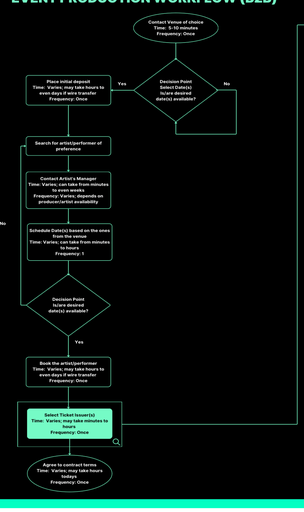
PR Ticketing Resale Market (Service Obtainable Market)

Expected to grow 6%-10% annually (Starting HERE)

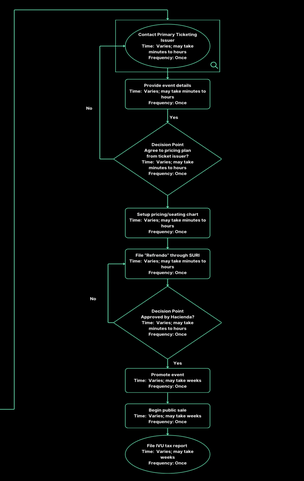
MEASURE

Current Industry Workflow

EVENT PRODUCTION WORKFLOW (B2B)



TICKET ISSUER WORKFLOW (B2B)



SIPOC Diagram

S SUPPLIERS	I INPUTS	P PROCESS	O OUTPUTS	C CUSTOMERS
• Ticket holders (original buyers) • Unverified sellers / scalpers • Social media groups & secondary listing sites (Facebook Marketplace & Clasificados Online) • Informal payment methods (ATH, PayPal, cash) • Unofficial websites (StubHub/Viagogo, Seat Geek, Vividseats)	• Tickets or screenshots (PDFs, QR codes, images, forwarded emails) • Unverified payment transfers • Event information (name, date, seat) • Buyer/seller messages or calls (text/DMs)	1. Search ticket offers online or via chat 2. Negotiate price directly 3. Transfer money via informal method 4. Receive ticket file or code 5. Attempt event entry 6. Discover acceptance or rejection at gate	• Successful entry (if ticket valid) • Fraudulent or duplicated ticket • Financial loss / scams • No traceability or refund • Erosion of trust in resale	• Event attendees (risk of fraud) • Promoters / issuers (lose control & royalties) • Sellers / scalpers (profit unfairly) • Regulatory bodies such as DACO & Hacienda (unable to track activity)

Market Benchmarks

PLATFORM	Quimba	StubHub / viagogo	ticketmaster	SEAT GEEK	vividseats
REGIONAL SYSTEM AVAILABILITY	YES	YES	NO	NO	NO
FRAUD DETECTION CAPABILITY	HIGH	MODERATE	MODERATE	HIGH	MODERATE
TRANSPARENCY SCORE	HIGH	LOW	LOW	MODERATE	LOW
ROYALTY INTEGRATION	YES	NO	NO	NO	NO
TOTAL TRANSACTION COST (%)	27%	30%	40%	35%	35%

Compliance & Regulation Frameworks

ANALYZE

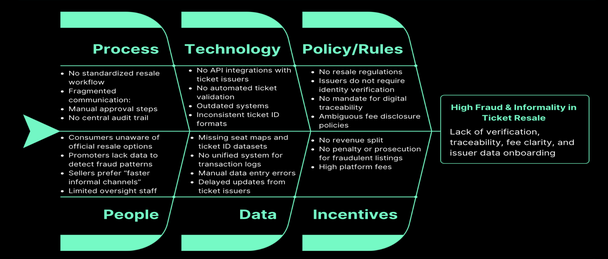
CTQ Prioritization

CTQ	Impact (1–5)	Severity (1–5)	Weighted Score (Impact × Severity)	Rank
Issuer Verification	5	5	25	1
User Traceability	5	4	20	2
Fee Transparency	3	3	9	3
Data Onboarding	3	3	9	4

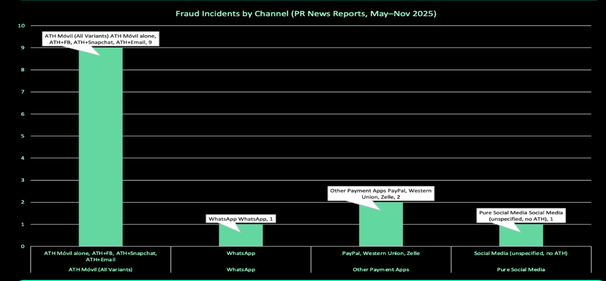
Gap Analysis

Process Area	AS-IS Condition (Current Market)	TO-BE Condition (Quimba)	Gap Identified
Verification	No direct issuer validation; resale tickets not cross-checked against official database.	Real-time validation through issuer API + ID matching.	High fraud exposure due to non-verified tickets.
User Identity & Traceability	Anonymous buyers/sellers; no unique identifiers; no behavioral history.	Unique user ID per transaction; traceable resale history.	Lack of data integrity and fraud detection capabilities.
Fee Transparency	Hidden fees; unclear markup; inconsistent pricing between channels.	Standardized, itemized fee breakdown for all parties.	VOC indicates distrust and dissatisfaction with unclear pricing.
Data Onboarding	Issuers do not share seat maps or ticket IDs; no unified data format.	Automatic ingestion of issuer data into Quimba.	Fragmented data → rework, errors, inconsistent resale listings.
Resale Workflow	Fragmented steps across IG/Facebook/Clasificados/etc.	Centralized, traceable workflow with digital record of all steps.	Inefficiencies, delays, high risk of misinformation.
Fraud Prevention	Manual reporting; no systemic prevention; reactive controls.	Automated fraud checks (verification, identity, transaction logs).	Missing preventive controls → fraud occurs upstream.

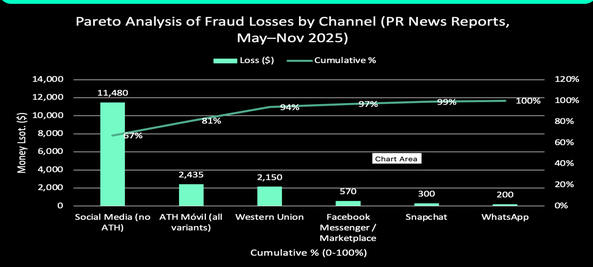
Ishikawa Diagram



Fraud Incidents by Resale Channel

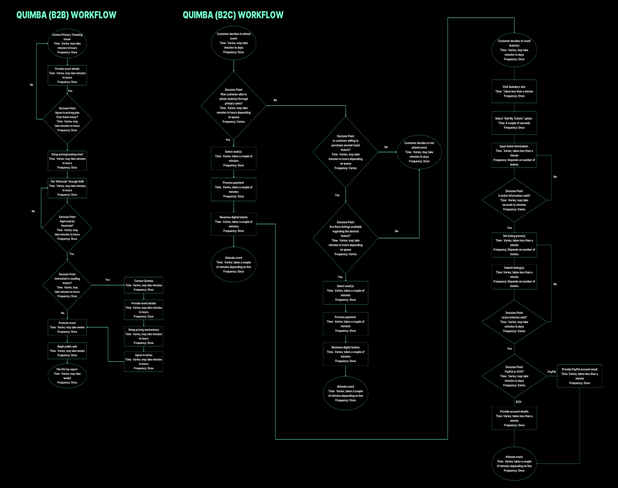


Major Contributors to Resale Fraud



DESIGN

Quimba's Workflow



Failure Mode	Primary CTQ Impacted	S	O	D	RPN	Design Control (Solution Direction)
No issuer API / ticket validation	Issuer Verification	10	6	9	540	Issuer API integration + ticket ID verification
Anonymous sellers (no KYC)	Traceability	9	7	8	504	Tiered KYC + unique seller IDs
Duplicate / resold tickets	Data Onboarding Reliability	10	5	8	400	Unique ticket ID lock + listing constraints
Ownership transfer not provable	Issuer Verification	10	4	9	360	Issuer-confirmed transfer + audit log
No buyer traceability	Traceability	8	6	7	336	User accounts + behavioral logging
Payment before ticket transfer	Reliability / Trust	9	5	7	315	Escrow-based transaction flow
Incomplete audit logs	Governance / Compliance	9	4	8	288	Immutable transaction ledger
Seat map / ticket ID mismatch	Data Onboarding Reliability	8	5	7	280	Canonical data schema + validation rules
Venue scan failures	Issuer Verification	10	3	9	270	Real-time validation + dynamic QR
Fee opacity / inconsistent markups	Fee Transparency	7	6	6	252	Standardized all-in pricing logic

Metric (CTQ)	AS-IS Baseline	Design Target	TO-BE / Prototype
Ticket verification time	Manual / Not possible	< 3 seconds	~1.5 seconds (via API)
Duplicate ticket rate	High / Unbounded	0%	0% (unique ticket ID lock)
Fraud detection capability	None	Detect before purchase	Real-time validation (via API)
Traceability coverage	None	100%	100% (user IDs + logs)

VERIFY

Failure Mode	Initial RPN	Post-Design RPN	Risk Status
No issuer verification	540	<100	Mitigated
Anonymous sellers	504	<120	Mitigated
Duplicate ticket resale	400	<90	Mitigated
Ownership transfer issues	360	<110	Mitigated

CTQ	AS-IS	Design Target	Verified Result
Ticket verification time	Not measurable	< 3 sec	1.73 sec
Duplicate ticket rate	High / unbounded	0	0
Fraud detection timing	Post-incident	Pre-purchase	Achieved
Traceability coverage	0	1	1

Quimba's Capstone Project successfully fulfilled the DMADV objective by transforming an informal, high-variability resale ecosystem into a controlled, verifiable, and economically sustainable system design. All defined CTQs were validated against measurable targets (1.73 sec verification time, 0% duplicate rate, preventive fraud detection, 100% traceability), and high-risk failure modes were reduced from catastrophic levels (>400 RPN) to controlled thresholds (<120). The proposed architecture demonstrates that upstream verification, identity enforcement, escrow-based controls, and issuer-level integration structurally eliminate defect injection points rather than relying on reactive mitigation. Statistical analysis confirmed instability in the AS-IS system, while verification results confirmed stabilization under the TO-BE configuration. Economic validation further demonstrated that the $24M resale segment in Puerto Rico represents a sustainable opportunity when structured under controlled governance and traceable workflows.