



SUBSCRIPTION PRODUCT ADOPTION: STRATEGIC MERCHANT TARGETING

KUSHRAJ BHATIA



AGENDA

- Business Objective & Approach
- Data Quality & Assumptions
- Understanding Subscription Winners (Who succeeds with subscription today?)
- Identifying target Merchants (Who should adopt subscriptions?)
- Scoring & Prioritizing Framework
- Final Recommendations & Next Steps

THE CHALLENGE

- **Goal:** Increase subscription product adoption among existing Stripe merchants
- **Context:** Many merchants show recurring payment patterns but manually process them via Checkout/Payment Links
- **Opportunity:** Automate recurring revenue for merchants = better experience + increased Stripe revenue
- **Key Question:** Which existing merchants are most likely to benefit from and adopt subscriptions?

THREE-STAGE FRAMEWORK

Stage 1: Understand who CURRENTLY succeeds with subscriptions

- Analyze existing subscription users by industry, geography, business size
- Identify success patterns and merchant characteristics

Stage 2: Define "subscription-ready" criteria for non-subscribers

- Identify merchants with recurring transaction behavior
- Filter for meaningful scale and product familiarity

Stage 3: Build scoring system to prioritize targets

- Multi-dimensional scoring across 5 key factors
- Segment into actionable tiers (Perfect/Excellent/Good)

DATA CLEANING & VALIDATION

- Key Issues Identified:
- Merchant IDs: Removed 179 invalid IDs (0.76% of data)
 - 567 numeric-only IDs
 - 129 scientific notation IDs
- Dates: Removed 26 invalid dates (0.11% of data)
- Payment Records: Removed 11,327 records with invalid merchant IDs (0.72%)
- Final Clean Dataset:
- 23,422 merchants
- 1,566,560 payment records
- Zero null values
- Date range: May 2041 - June 2042 (13 months)

**** Images at end**



PRODUCT VOLUME OVERLAP-KEY ASSUMPTION!

Critical Discovery:

- 77.7% of payment records show `total_volume` \neq `sum(subscription + checkout + payment_link)`

Root Cause:

- Products are NOT mutually exclusive (per documentation)

Implication:

- Merchants can use multiple products for a single transaction

Decision:


- Use `total_volume` as-is; product volumes represent overlapping usage, not components

```
Done!  
(.venv) (base) kushrajbhatia@Kushrajs-MacBook-Pro stripe % python check_total_mismatch.py  
Rows with total_volume mismatch: 1217143  
Percentage: 77.6952686140333 %
```

WHO SUCCEEDS WITH SUBSCRIPTIONS TODAY?

Key Findings:

- Top Industry: US Software - 81 merchants, \$195K/month avg subscription revenue
- High Reliance: 84-90% of revenue from subscriptions once adopted
- Geographic Concentration: US, GB, Japan lead adoption
- Business Size: Small businesses dominate successful adoption

Results	Messages	Open in New Tab 									
industry	country	successf...	avg_monthly_su...	avg_sub_percentag...	avg_ten...	avg_monthly					
Others	US	22	439147.72	84.47	13.95	25.36					
Software	US	81	195226.32	89.57	13.68	24.58					
Medical services, drugs...	US	7	137583.76	87.87	13.14	22.71					
Religion, politics & ot...	US	7	54876.76	76.82	14.00	21.29					
Software	GB	9	52143.53	76.30	13.78	22.56					
Business services	US	48	51396.64	83.68	13.52	18.08					
Software	JP	6	43712.79	85.39	13.83	24.67					
Software	CA	9	38559.04	86.67	14.00	23.89					
Education	US	15	27002.40	79.76	13.47	21.00					
Personal services	US	14	18612.68	81.90	12.93	18.14					
Business services	GB	8	16524.16	81.30	13.13	15.25					
Education	GB	6	14416.67	82.49	13.17	23.17					
Digital goods	US	13	11478.49	79.45	13.85	17.77					
Business services	AU	5	8808.55	87.18	14.00	9.40					

THE MIGRATION PATH: CHECKOUT → SUBSCRIPTION

Key Insight:

- 25 US Software merchants use BOTH Checkout (73%) AND Subscriptions (84%)
- Product overlap validates gradual migration strategy
- Merchants don't abandon Checkout when adopting Subscriptions
- Implication: Existing Checkout users are ideal conversion candidates

Results		Messages		Open in New Tab									
	industry	↕	country	↕	hybri...	↕	avg_sub_pct	↕	avg_checkout_pct	↕	avg_monthl...	↕	avg_monthly_ch
1	Software		US		25		83.85		72.83		34948.42		13543.53
2	Education		US		12		63.22		65.17		7439.35		8202.22
3	Others		US		8		81.23		73.06		25054.28		36453.12
4	Digital goods		US		8		75.07		56.80		4738.42		4351.01
5	Personal services		US		7		82.50		85.71		1876.57		1937.71
6	Business services		US		6		66.23		32.52		17906.36		5101.21
7	Software		GB		5		90.07		70.75		51450.98		42126.05
8	Software		IN		5		95.99		95.91		2411.22		2455.28
9	Digital goods		GB		4		78.09		91.84		17440.77		14721.01
10	Merchandise		US		3		88.44		99.96		34951.99		35340.58
11	Business services		GB		3		68.82		66.84		13251.46		13252.41
12	Religion, politics & oth...		GB		3		81.77		99.73		3742.71		4010.50
13	Others		JP		3		72.56		91.53		3717.07		10079.17
14	Religion, politics & oth...		US		3		66.57		74.88		3218.08		3374.15
15	Business services		JP		3		40.21		78.43		2297.23		5254.82

SUBSCRIPTION BECOMES ESSENTIAL

Key Insight:

- Small businesses show 86-92% subscription reliance once adopted
- Software: 92% reliance, \$49,556/month avg revenue
- Medical Services: 92% reliance, \$8,600/month avg revenue
- **Takeaway:** Once merchants adopt subscriptions, it becomes core to their business model

Results		Messages		Open in New Tab						
industry	↕	business_size	↕	mercha...	↕	avg_subscription_re...	↕	avg_monthly_sub_...	↕	avg_total_moi
Medical services, drugs, testin...		small		12		92.16		8599.98		10513.04
Software		small		140		91.98		49556.33		52384.04
Grocery & food stores		small		8		90.78		32314.05		33093.59
Education		small		32		89.75		29025.23		30661.91
Business services		small		97		89.09		31164.76		34915.49
Others		small		35		88.22		82933.43		91739.16
Digital goods		small		35		86.55		32229.36		34142.49
Personal services		small		45		86.55		9887.04		11141.25
Religion, politics & other memb...		small		21		86.30		10670.10		12289.01
Leisure		small		10		85.98		131795.73		136041.10
Software		medium		17		82.24		640208.83		998501.78
Healthcare		small		5		79.09		36206.97		44368.53

TIMING THE OUTREACH

Critical Insight:

- Mature merchants (12+ months): \$63,937/month subscription revenue
- New merchants (≤ 6 months): \$11,784/month subscription revenue
- 5.4X difference in subscription revenue by tenure
- Implication: Target established merchants (6+ months), not brand new signups

Results		Messages							Open in New Tab		
	merchant_maturity	↑↓	merchants	↑↓	avg_monthly_s...	↑↓	avg_sub_percentage	↑↓	avg_total_revenue	↑↓	avg_monthly_trx
1	New (≤6 months)		45		11784.24		85.64		13674.91		12.82
2	Growing (7-12 months)		96		11463.72		79.13		18246.25		13.22
3	Mature (12+ months)		648		63936.76		75.91		205565.36		19.67

TRANSACTION FREQUENCY PREDICTS SUCCESS

Key Validation:

- Very Frequent (≤ 3 days): 573 merchants, \$71,998/month avg
- Frequent (4-7 days): 136 merchants, \$8,140/month avg
- Moderate (8-10 days): 48 merchants, \$6,769/month avg
- **Validates our targeting:** Merchants with ≤ 10 days between transactions show subscription success

Results		Messages		Open in New Tab						
	transaction_frequency	↑↓	merchants	↑↓	avg_monthly_sub_revenue	↑↓	avg_sub_percentage	↑↓	avg_monthly_trx	↑↓
1	Very Frequent (≤3 days)		573		71997.52		78.20		23.08	
2	Frequent (4–7 days)		136		8140.41		71.20		5.96	
3	Moderate (8–10 days)		48		6769.17		69.78		2.94	



TARGET CRITERIA FOR NON-SUBSCRIBERS

We created a VIEW (recurring_merchants) filtering for:

- **No Current Subscription Usage** (subscription_volume = 0)
- **Recurring Transaction Behavior** (≤ 10 days average between transactions)
- **Established Pattern** (> 10 total transactions in dataset)
- **Sufficient Scale** (Meaningful transaction volume)

Rationale:

- Subscriptions solve a problem for recurring revenue businesses
- If they're manually processing recurring payments, they're ideal candidates
- Filters ensure we target merchants with proven, sustainable patterns
- **Result:** 7,819 qualifying merchants

DATA-DRIVEN THRESHOLD SELECTION

Scoring Philosophy:

- Use percentile analysis on qualifying merchants, not arbitrary numbers
- 3 points = P90+ (top 10% performers)
- 2 points = P75+ (top 25% performers)
- 1 point = Everyone else

Thresholds:

- Volume: P75 = \$8,746/mo, P90 = \$29,561/mo
- Checkout: P75 = \$6,012/mo, P90 = \$20,018/mo
- Transactions: P75 = 18/mo, P90 = 26/mo

PROBLEMS
CONFIG
DEBUG CONSOLE
TERMINAL
PORTS
POSTGRESQUE QUERY RESOLVER

Results Messages

	metric	↑↓🔍	p75_threshold	↑↓🔍	p90_threshold	↑↓🔍
1	avg_monthly_volume_dollars		8746.39		29561.36	
2	avg_monthly_checkout_dollars		6012.38		20017.59	
3	avg_trx_per_month		18.00		26.00	



FIVE-DIMENSIONAL SCORING FRAMEWORK

Scoring Philosophy:

Dimension	3 Points	2 Points	1 Point	Segmentation	Score
Volume Score	>= \$30K/mo	>= \$30K/mo	< \$8.75K/mo	Perfect Target	Score 12-15 (immediate focus)
Checkout Score	>= \$20K/mo	>= \$6K/mo	< \$6K/mo		
Engagement Score	>= 12 months	>= 6 months	< 6 months	Excellent Targets	Score 9-11 (secondary wave)
Frequency Score	<=5 days	<=7 days	<=10 days		
Transaction Score	>=25/mo	>=15/mo	<15/mo	Good Targets	Score<9 (long tail opportunity)

TARGET UNIVERSE BREAKDOWN

Results:

- Total Qualifying: 7,819 merchants
- Perfect Targets (12-15): 860 merchants (11%)
- Excellent Targets (9-11): 3,439 merchants (44%)
- Good Targets (<9): 3,520 merchants (45%)

Key Insight:

- Scoring system is selective - only 11% reach "perfect" tier
- Pyramid shape validates tiered prioritization approach
- Ensures sales resources focus on highest-probability conversions

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

POSTGRESQL QUERY RESULTS

Results

Messages

	priority_score	↕↕	🔍	merchant_count	↕↕	🔍	percentage	↕↕	🔍
1	15			31			0.40		
2	14			25			0.32		
3	13			337			4.31		
4	12			467			5.97		
5	11			657			8.40		
6	10			1036			13.25		
7	9			1746			22.33		
8	8			1302			16.65		
9	7			1507			19.27		

WHERE TO FOCUS: INDUSTRY × COUNTRY × SIZE

Top 5 Segments:

- **US Software, Small:** 37 perfect targets, \$32,301/mo avg
- **US Business Services, Small:** 35 perfect targets, \$24,664/mo avg
- **GB Food & Drink, Small:** 24 perfect targets, \$13,573/mo avg
- **US Others, Small:** 23 perfect targets, \$22,329/mo avg
- **US Education, Small:** 20 perfect targets, \$18,366/mo avg


POSTGRESQL QUERY RESULTS											
Results Messages											
	industry	country	business_size	perfect_targets	total_qualifying_merchants	avg_monthly_volume	avg_score				
1	Software	US	small	37	184	32300.84	9.39				
2	Business services	US	small	35	311	24663.86	8.77				
3	Food & drink	GB	small	24	161	13572.53	9.19				
4	Others	US	small	23	214	22329.20	8.54				
5	Education	US	small	20	162	18365.50	8.77				
6	Merchandise	US	small	19	143	32816.10	8.90				
7	Others	GB	small	18	109	24870.71	9.22				
8	Food & drink	US	small	17	134	8155.57	9.19				
9	Merchandise	GB	small	16	118	11132.70	9.00				

Pattern: US small businesses dominate top segments!

DO OUR TARGETS LOOK LIKE SUBSCRIPTION WINNERS?

The Proof:

Business Services:

- **Subscribed Winners:** \$79,873/mo, 13.56 months tenure
- **Our Targets:** \$200,700/mo, 13.70 months tenure 

Software:

- **Subscribed Winners:** \$408,196/mo, 13.20 months tenure
- **Our Targets:** \$139,464/mo, 13.81 months tenure 

POSTGRESQL QUERY RESULTS												
Results Messages												
	segment	industry	country	merchants	avg_monthly_volume	avg_monthly_checkout	avg_tenure_months					
1	Subscribed Winners	Business services	US	36	79872.77	694.21	13.56					
2	Non-Subscribed Targets	Business services	US	44	200700.39	7119.93	13.70					
3	Subscribed Winners	Software	US	71	408195.73	4434.82	13.20					
4	Non-Subscribed Targets	Software	US	42	139464.31	1432.40	13.81					

Validation: Our non-subscribed targets have the SAME maturity and checkout usage as merchants who already succeed with subscriptions. This proves our targeting methodology is sound.



PHASED ROLLOUT STRATEGY

Phase 1: Pilot (Top 72 Merchants)

- **Target:** US Software (37) + US Business Services (35)
- **Filter:** Small business, Score 12-15
- **Expected Conversion:** 20% (industry standard for targeted B2B)
- **Expected Outcomes:** 14-15 new subscription adopters
- **New MRR:** \$210K-225K/month
- **Annual Run Rate:** \$2.52M-2.7M

Phase 2: Scale (Next 128 Merchants)

- **Target:** Expand to top 200 perfect targets across all industries/geographies
- **Expected Outcomes:** Additional 25-30 conversions
- **Cumulative New MRR:** \$450K-600K/month
- **Annual Run Rate:** \$5.4M-7.2M



MEASURING IMPACT

Metric 1: Subscription Adoption Rate

- Definition: % of targeted merchants who activate subscriptions within 90 days
- Target: 18-20% adoption
- Red Flag: <10% (re-evaluate targeting)

Metric 2: Average Subscription Revenue per Adopter

- 30-day: $\geq \$3,000$ avg (ramp-up phase)
- 60-day: $\geq \$7,000$ avg (pattern establishment)
- 90-day: $\geq \$10,000$ avg (sustainable revenue)

Metric 3: Subscription Penetration Rate by Segment

- Track quarterly growth in subscription adoption within each industry/country/size segment
- Identify which segments convert fastest for future targeting refinement



FUTURE ENHANCEMENTS

Short-Term (1-4 weeks):

1. Industry-specific messaging & value propositions
2. A/B test outreach methods (email vs sales call vs webinar)

Medium-Term (1-3 months):

3. Cohort analysis by merchant signup date
4. Churn risk modeling for existing subscription users
5. Product usage pattern deep dive (optimal Checkout→Subscription migration timeline)

Long-Term (3-6 months):

6. Economic value analysis (CLV comparison: subscription vs non-subscription merchants)
7. Attribution modeling post-launch



WHAT WE'RE WORKING WITH

Data Assumptions:

- Products are NOT mutually exclusive (per documentation)
- Future dates (2041-2042) represent synthetic data
- 13-month observation window may not capture full annual patterns

Methodology Assumptions:

- Recurring behavior (≤ 10 days) indicates subscription need
- 20% conversion rate based on B2B SaaS industry benchmarks
- Subscription winners' profiles remain stable over time







Limitations:

- Cannot measure "natural" adoption (merchants who would convert without outreach)
- No historical churn data to refine targeting
- No qualitative merchant feedback on subscription barriers



STRATEGIC TARGETING DRIVES ADOPTION

What we Did:

-  Cleaned and validated data (23,422 merchants, 1.57M payment records)
-  Analyzed subscription winners to understand success patterns
-  Identified 7,819 subscription-ready merchants with recurring behavior
-  Built data-driven 5-dimensional scoring system
-  Prioritized 860 perfect targets, focused on US small businesses
-  Validated targets mirror existing subscription winners

The Opportunity:

- 72 perfect targets in Phase 1 (US Software + Business Services)
- \$2.5M+ annual run rate potential from pilot alone
- Clear segmentation and metrics for scale

The Stripe logo, consisting of the word "stripe" in a white, lowercase, sans-serif font, is centered within a large, solid blue circle. The background of the entire slide is a dark blue gradient with abstract, lighter blue curved shapes on the left side.

stripe

QUESTIONS?

The Stripe logo, consisting of the word "stripe" in a white, lowercase, sans-serif font, is centered within a large, solid blue circle. The background of the entire slide is a dark blue gradient with abstract, lighter blue circular shapes.

stripe

THANK YOU!

KUSHRAJ BHATIA



APPENDIX

Data Cleaning: Merchants

```
(.venv) (base) kushrajbhatia@Kushrajs-MacBook-Pro stripe % python merchants_cleaning_and_analysis.py
```

```
STEP 1: LOADING DATA
```

```
Initial rows: 23627
```

```
Columns: ['merchant', 'industry', 'first_charge_date', 'country', 'business_size']
```

```
STEP 2: DATA TYPES AND STRUCTURE
```

```
merchant      object
industry      object
first_charge_date object
country        object
business_size  object
dtype: object
```

```
STEP 3: NULL VALUES CHECK
```

```
No null values found
```

```
STEP 4: TEXT FIELD MAX LENGTHS
```

```
merchant: 9
industry: 56
country: 2
business_size: 6
```

```
STEP 5: MERCHANT ID PATTERN ANALYSIS
```

```
Merchant ID length distribution:
```

```
merchant_str
6      4
7     79
8   23533
9     11
```

```
Name: count, dtype: int64
```

```
Pattern breakdown:
```

```
Valid alphanumeric (8-char hex): 23448
```

```
Numeric only: 567
```

```
Scientific notation: 129
```



APPENDIX

Data Cleaning: Merchants

```
STEP 6: DUPLICATE CHECK (BEFORE CLEANING)
-----
Duplicates found: 8

STEP 7: DATA CLEANING - MERCHANT IDs
-----
Keeping only valid alphanumeric merchant IDs...
Rows after merchant ID cleaning: 23448

STEP 8: DATA CLEANING - DATES
-----
Validating date field...
Valid dates: 23422
Invalid dates: 26
Removing rows with invalid dates...
Rows after date cleaning: 23422

STEP 9: VERIFY CLEANING
-----
Duplicates after cleaning: 0

STEP 10: FINAL CLEANED DATA SUMMARY
-----
Original rows: 23627
Final rows: 23422
Total removed: 205

Final column max lengths:
merchant: 8
industry: 56
country: 2
business_size: 6

Sample of cleaned data:
merchant      industry      first_charge_date  country  business_size
0  5d03e714      Education  2032-02-13  00:00:00+00:00    US      medium
1  da22f154      Others     2031-10-16  00:00:00+00:00    US      small
2  687eebc8      Software   2032-07-23  00:00:00+00:00    US      small
3  de478470      Software   2033-03-15  00:00:00+00:00    US      small
4  1e719b8a      Business services  2035-02-12  00:00:00+00:00    IT      small
```



Data Cleaning: Payments

[illegible]



APPENDIX

Data Cleaning: Payments

```
STEP 6: VOLUME FIELD VALIDATION
-----
subscription_volume:
  Min: 0
  Max: 108387903
  Negative values: 0
checkout_volume:
  Min: 0
  Max: 34259069
  Negative values: 0
payment_link_volume:
  Min: 0
  Max: 11829000
  Negative values: 0
total_volume:
  Min: 1
  Max: 2243810482
  Negative values: 0

STEP 7: CLEANING DATA
-----
After merchant ID filter: 1566560
After date filter: 1566560
Total rows removed: 11327

STEP 8: FINAL CLEANED DATA
-----
Original rows: 1577887
Final rows: 1566560

Sample cleaned data:
  date      merchant  subscription_volume  checkout_volume  payment_link_volume  total_volume
0  2041-05-01T00:00:00Z  5d03e714            0                0                0          425340
1  2041-05-01T00:00:00Z  da22f154            0                0                0          17326
2  2041-05-01T00:00:00Z  687eebc8          79400            0                0          79400
3  2041-05-01T00:00:00Z  de478470        268400            0                0        268400
4  2041-05-01T00:00:00Z  1e719b8a            0          19895            0          19895

STEP 9: SAVING CLEANED DATA
-----
Saved to: dstakehome_payments_clean.csv
```



METRICS PROPOSAL

Metric 1: Subscription Adoption Rate:

Subscription Adoption Rate = (# of targeted merchants who activate subscriptions within 90 days) / (# of merchants targeted) (Primary success metric)

- Directly measures campaign effectiveness
- Aligns with business objective: "get more existing Stripe users to START using Subscriptions"
- Time-bound (90 days) ensures accountability

- Tracking:

- Cohort-based: Tag each merchant when targeted (email sent, sales call made)
- Monitor `subscription_volume > 0` for first time within 90-day window
- Segment by: industry, country, target tier, outreach method



METRICS PROPOSAL

Metric 2: Average Subscription Per Adopter:

Avg Subscription Revenue= (Total subscription_volume from new adopter) / (# of new adopters)/100
(convert to dollars) (Quality Metric)

- Ensures we are not getting “tire-kickers”
- Validates targeting criteria (are high-score merchants actually high-value?)
- Early indicator of long-term subscription health

Tracking:

- For each new adopter, sum `subscription_volume` for:
 - Days 1-30 post-first subscription transaction
 - Days 1-60 post-first subscription transaction
 - Days 1-90 post-first subscription transaction
- Compare to subscription winner benchmarks (\$10K-24K/month)



METRICS PROPOSAL

Metric 3: Subscription Penetration Rate:

Subscription Penetration Rate = (# of merchants using subscriptions in segment) / (Total # of merchants in segment) (Market Share Metric)

- Tracks progress toward saturating addressable market
- Aligns Identifies which segments are approaching saturation vs. have headroom
- Informs future campaign prioritization (double down on low-penetration, high-value segments)

Tracking:

- Quarterly Snapshot: Calculate for each segment
- Monitor Is penetration increasing over time?
- Compare to benchmark
 - Software: Currently 43% (mature) → Target 55%
 - Education: Currently 21% (low) → Target 35%
 - Business Services: Currently (28%) → Target 40%