JPAAWG #9 · TOKYO

Hidden costs of Non-human Interactions

What machines do to opens, clicks, automations and ad revenue.

非人間的インタラクション（NHI）の隠れたコスト

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SPEAKERS

Who we are

登壇者紹介

OMNIVERY

Jakub Olexa

Founder & CEO, Omnivery. In email since 2001. Omnivery screens billions of opens and clicks for senders and platforms, and runs its own mission-critical sending.

BEEHIIV

Mariska Calabrese

VP, Security, beehiiv. beehiiv is a SaaS content creation platform specializing in Newsletters and provides monetization opportunities through ads using its own ad network. Every paid ad click is revenue for a publisher and a cost for an advertiser.

2026 SO FAR

Every one of these is somebody's KPI

58%

of marketing email opens are machines

36%

of marketing email clicks are machines

86%

of paid ad clicks are machines

開封の58%、クリックの36%、有料広告クリックの86%は機械によるもの

Opens and clicks: marketing (bulk) email, 2026 YTD, all recipients, newsletter archives excluded. Ad clicks: one newsletter ad network, 13 weeks.

DEFINITION

What is NHI?

Opens and clicks generated by software, not people.

人ではなくソフトウェアが生む開封・クリック

- **Privacy proxies** fetch every image
- **Security scanners** open every link
- **Mailbox link-fetching** and previews
- **Monitoring** and seed inboxes
- **Fraud**, the small part that looks human

Most

are innocent. All of them cost something.

2020

The only bots were security scanners

2020年：開封の機械比率0%、クリックの13.5%は企業のスキャナー

0%

of opens were machines

13.5%

of clicks were machines, almost all security scanners in business inboxes

Marketing (bulk) email, full year 2020, all recipients, newsletter archives excluded. Consumer mailboxes alone: 1.2% of clicks.

01 / MAIL PRIVACY PROTECTION

Apple changes everything

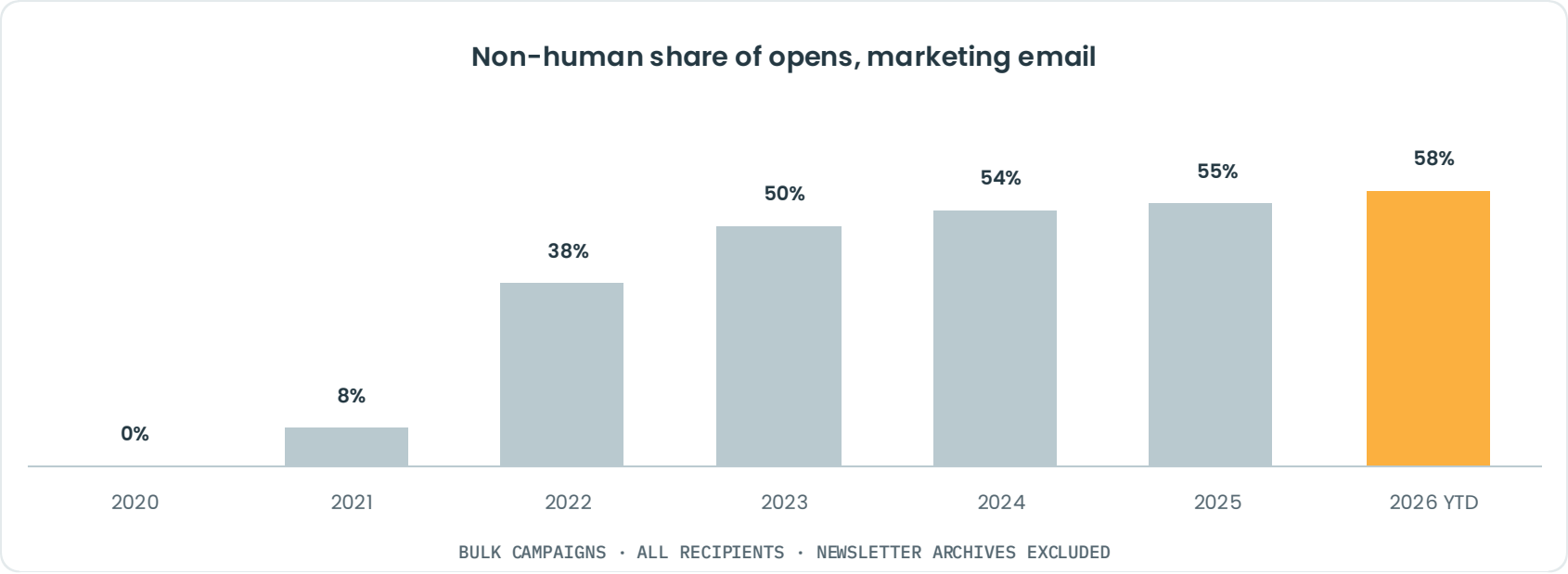
September 2021: Apple fetches every image, read or not.

Appleのメールプライバシー保護（MPP）

OPENS

More than half of opens are machine fetches

マーケティングメールの開封の58%が機械による取得



CONSEQUENCES

The open is dead as a metric

And everything built on it inherits the error.

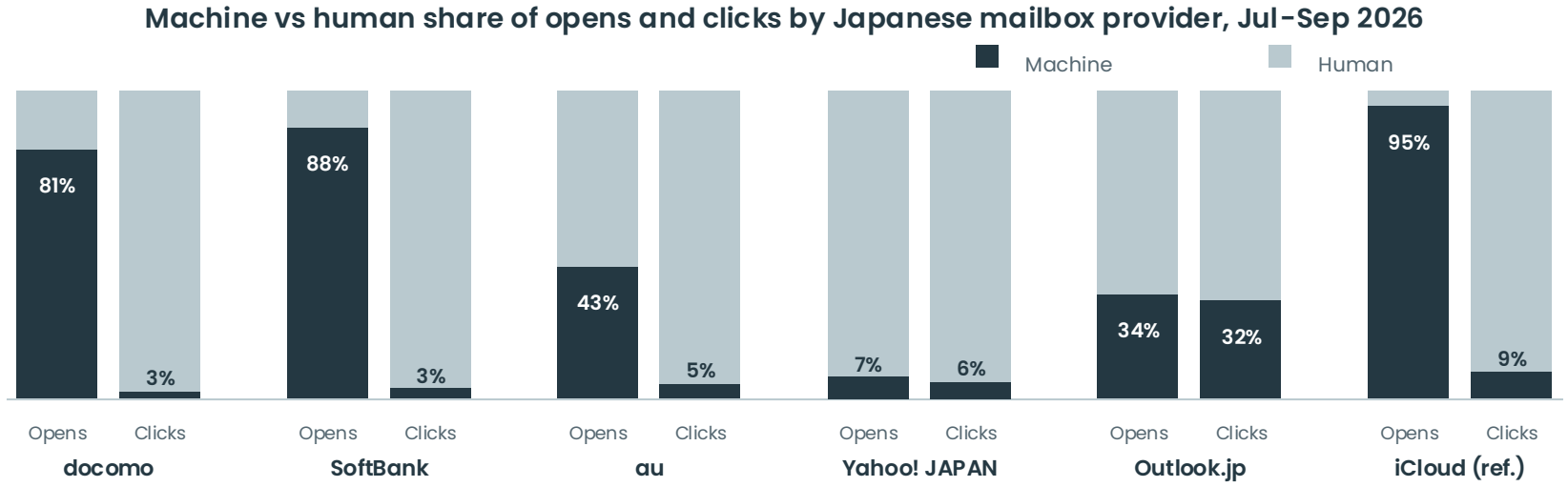
開封率はもはや指標として機能しない

- Open rate measures **machines** as often as people
- "Resend to non-openers" **skips** people who never saw it
- "Opened, send follow-up" goes to people who **didn't read** it
- Send-time optimisation learns from **proxy fetch times**

JAPAN

Japan: the iPhone effect

キャリアメールの開封の8割以上は機械。クリックは約3%のまま



OMNIVERY SENDING STREAM · 13 WEEKS · CLICK VOLUMES SMALL, DIRECTIONAL

02 / 2024-2026

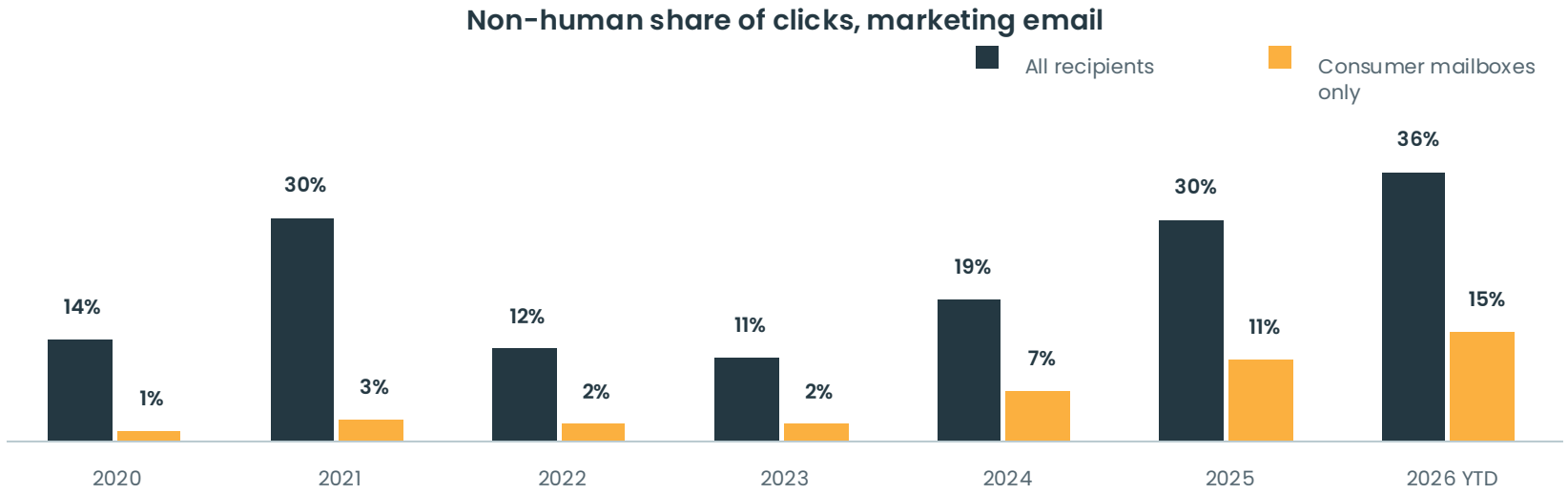
The click turns

クリックも機械化する

CLICKS

Scanners first, then consumers joined

個人向けメールボックスのクリックも3年で約7倍に

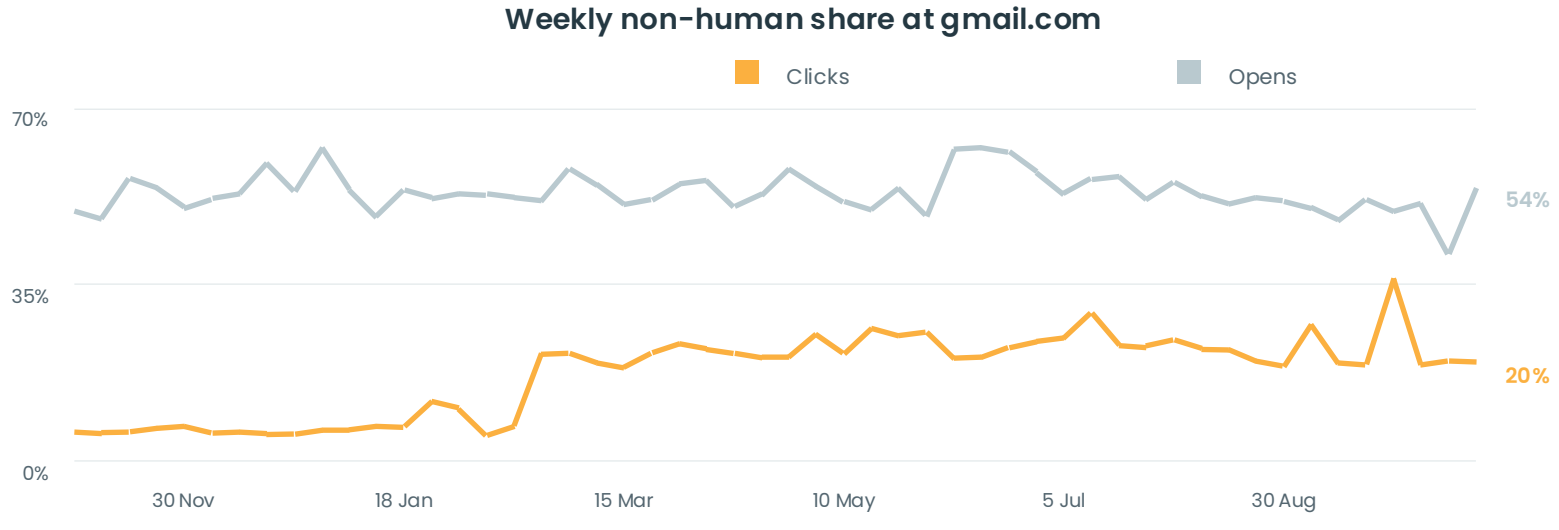


BULK CAMPAIGNS · NEWSLETTER ARCHIVES EXCLUDED · 2021 PEAK: BUSINESS-HEAVY SENDING MIX

GMAIL

A February step that never went back

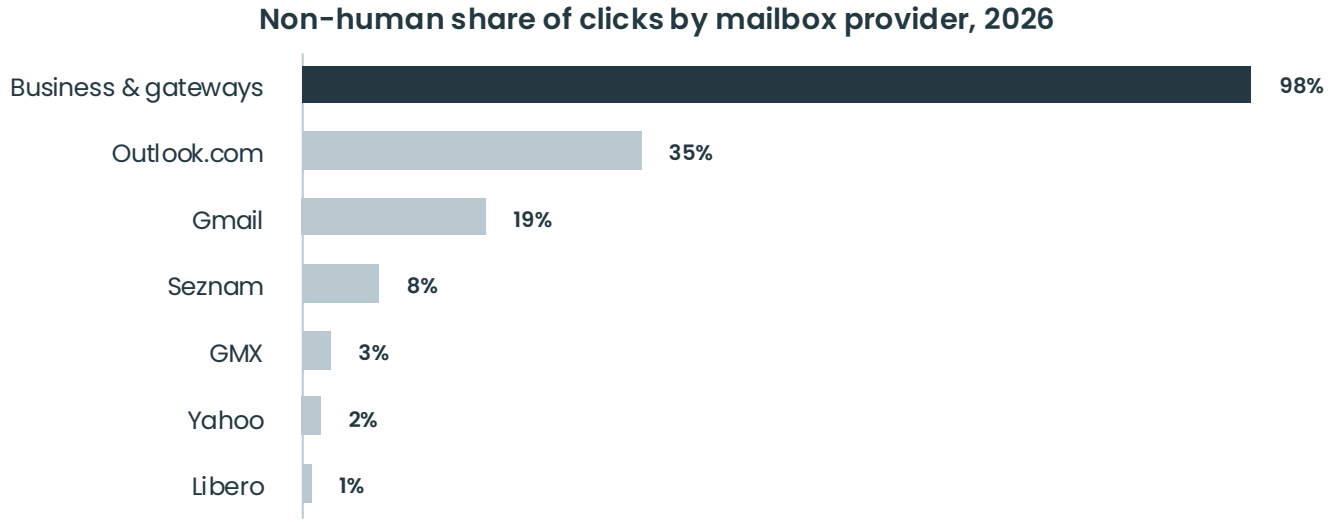
Gmailのクリック：約5%→2月中旬以降20〜25%、8か月経っても変わらず



RECIPIENTS

Same click, very different recipient

同じクリックでも宛先で全く違う

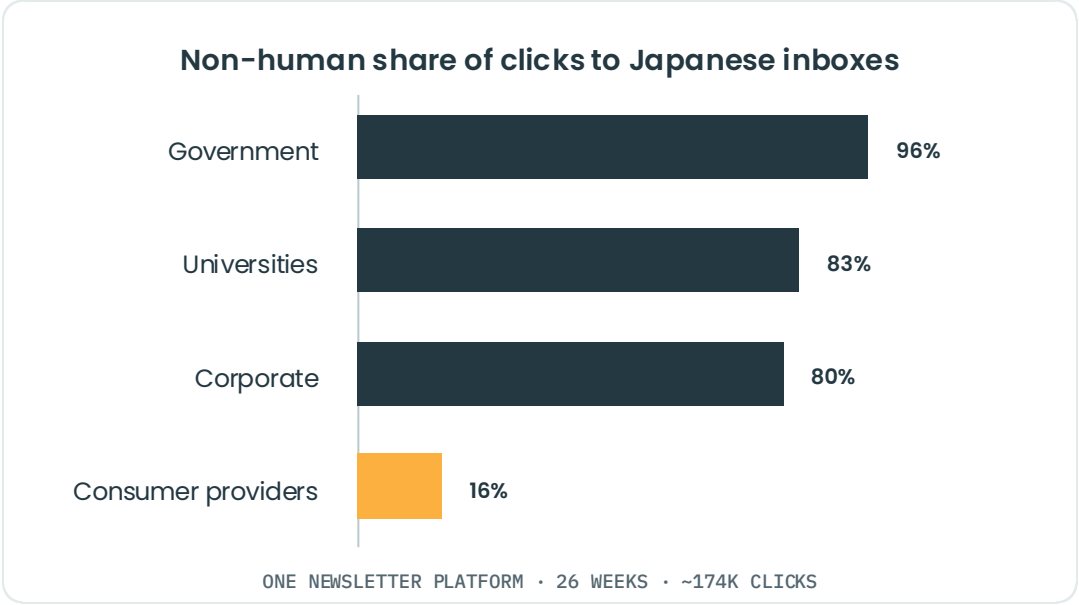


BUSINESS RANGE 57-98% SPANS CORPORATE DOMAINS AND SECURITY GATEWAYS

JAPAN

Who clicks your links?

企業・大学・官公庁宛てのクリックの80〜96%は非人間



80-96%

of clicks to corporate, university and government inboxes

- Consumer providers: Yahoo! JAPAN, OCN, nifty, docomo, au, hotmail.co.jp, outlook.jp

It's not just reporting

指標だけの問題ではない

AUTOMATIONS

Automations fire on machines

B2Bでは「クリックした」宛先の62%は一度も人としてクリックしていない

12%

of subscribers who "clicked" in one week never clicked as a person

62%

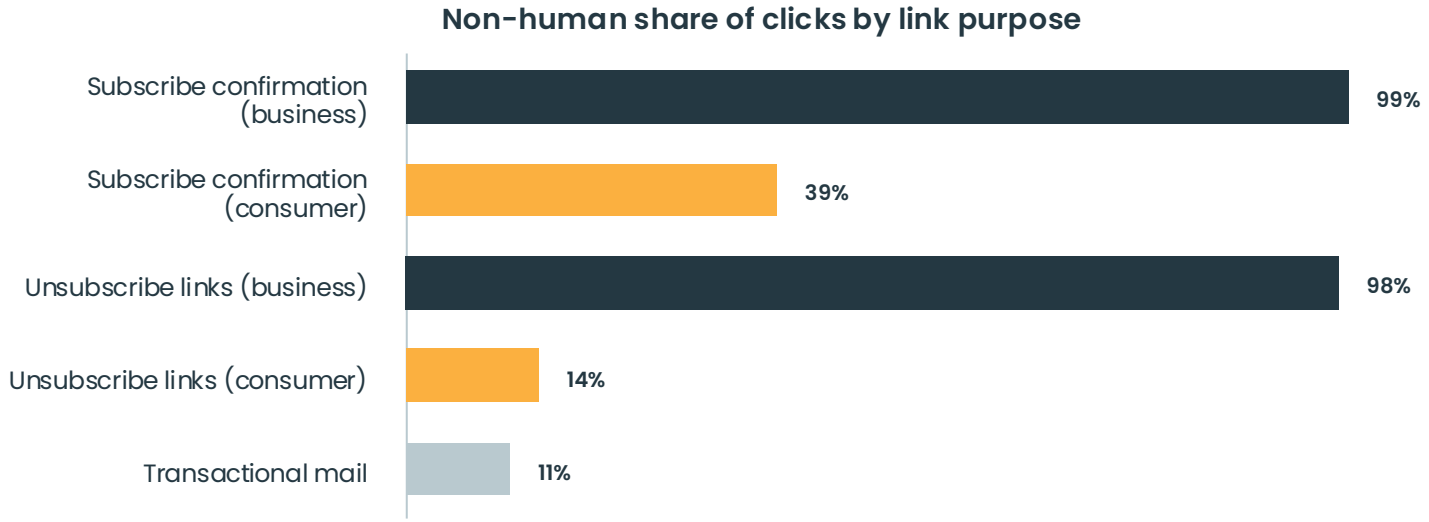
in business inboxes

- Journeys advance, segments fill, sales teams get **"hot lead"** alerts, for nobody

ACTION LINKS

Action links get clicked by machines first

購読・解除・ログインリンクは機械が先にクリックする



SUBSCRIBE/UNSUBSCRIBE: ONE WEEK, NEWSLETTER STREAM · TRANSACTIONAL: AUG-SEP 2026 · EXPOSURE, NOT OUTCOME

DESIGN RULE

Design for machines clicking first

リンクと結果の間に「人の操作」を挟む

1

Links never act on GET

Anything that changes state on a single click will be triggered by a machine.

2

Put a human step in between

A landing page with a button, or an RFC 8058 POST.

3

Machine share drops to ~0%

Where there is an explicit step, unsubscribe and confirm events are almost all human.

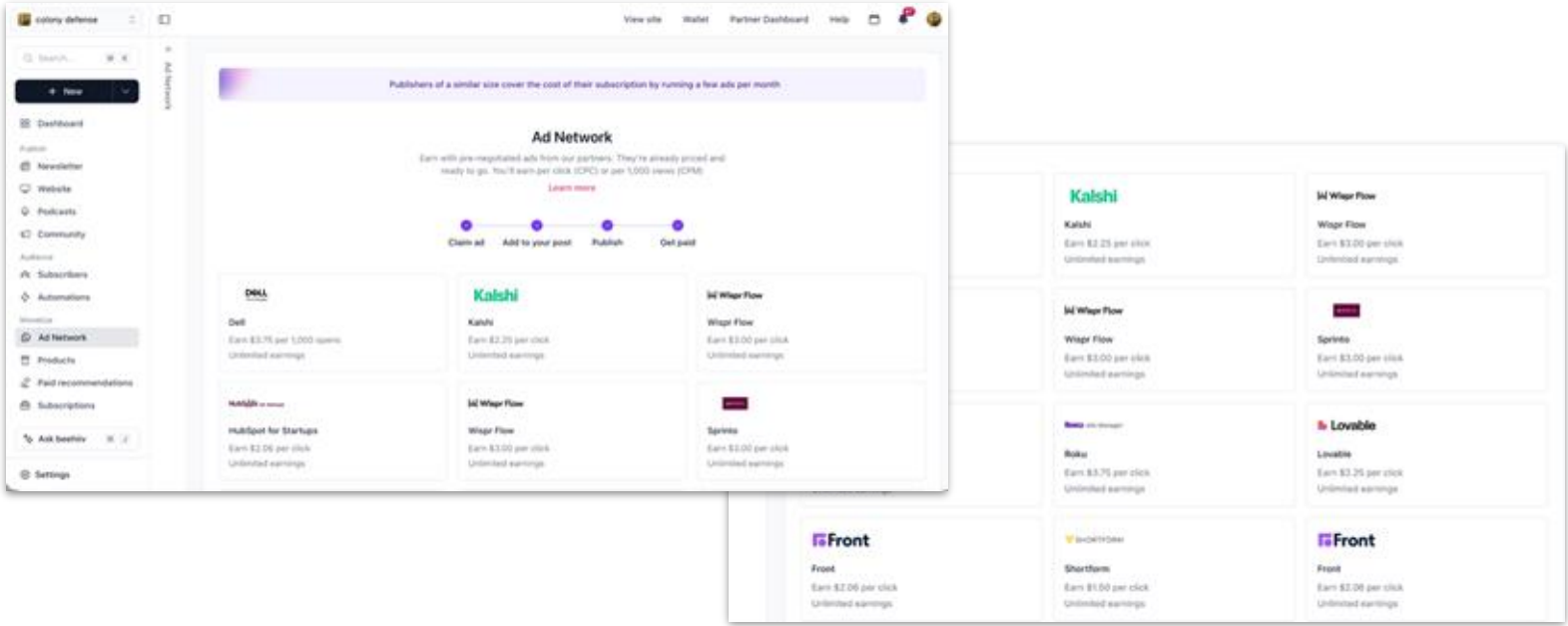
04 / NEWSLETTER AD NETWORKS

When clicks become money

クリックがお金になるとき

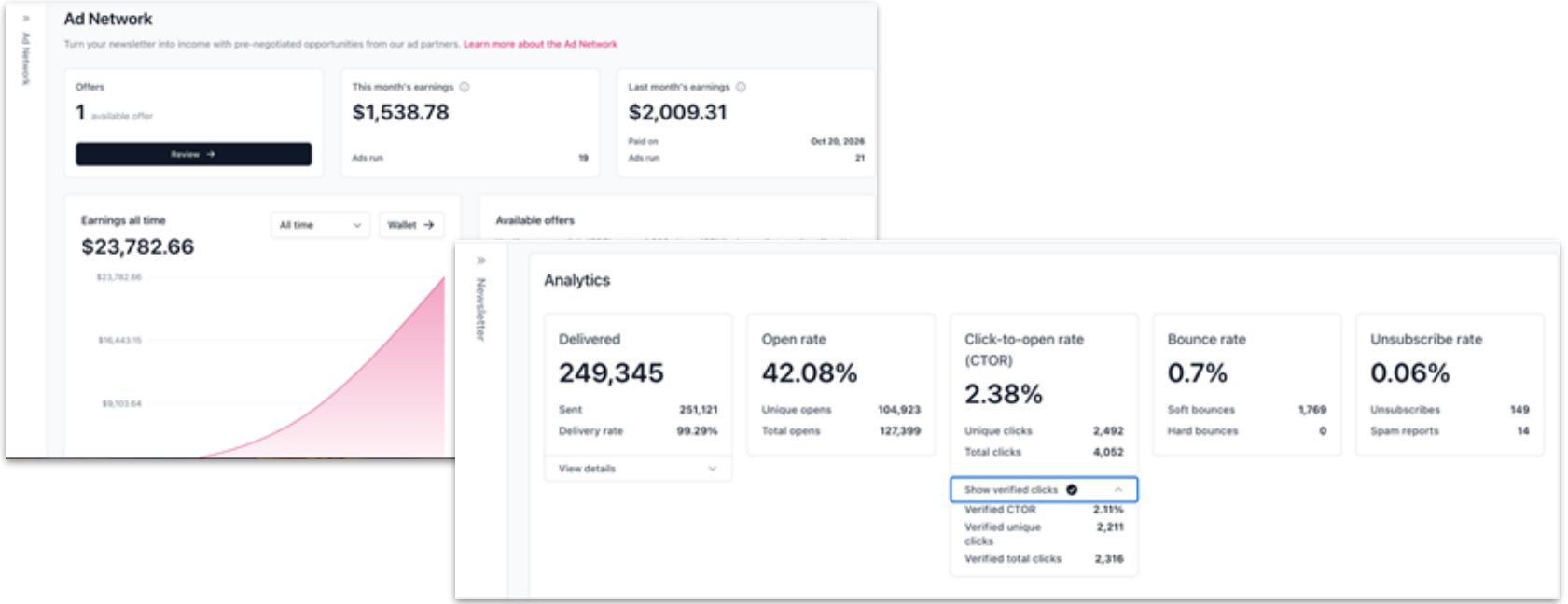
How a newsletter ad network works

ニュースレター広告ネットワークの仕組み



What the publisher sees

パブリッシャー側から見た画面



BEEHIIV · AD NETWORK

Ad network at $2.50 CPC: $73.3M stopped

広告ネットワーク（CPC 2.50ドル）：7,330万ドルを阻止

$11.8M

verified human clicks, the only clicks paid

$39.8M

NHI from security scanners

$33.5M

botnet and other invalid NHI

- **34.0M ad clicks in 2026. Only 1 in 7 verified.**

BEEHIIV · AD CLICKS

One send vs. the whole network

1回の配信とネットワーク全体の比較

ONE SEND

19,231
delivered

1,431
subscribers clicked

6,933
ad clicks

VERIFIED HUMAN

151
verified (2.2%)

WHOLE NETWORK, LAST 30 DAYS

2.86M
ad clicks

1.39M
scanner NHI

1.09M
botnet / other

VERIFIED HUMAN

377K
verified (13.2%)

Bots at the front door

入口に押し寄せるボット：アカウントと購読者

10,618

new accounts flagged at signup in 2026

268K

bot subscribe requests blocked in 14 days

~95%

of new subscribers arrive via API or import, never bot scored

- **Bot scoring sees only ~5% of new subscribers**

BEEHIIV · ENGAGEMENT

Inflated engagement hides non-readers

水増しされたエンゲージメントが非読者を隠す

50.2%

of 2026 clicks not verified as human

12% → 36%

gmail.com clicks not verified as human, peak week of 22 Feb

91%

of one API-fed list's clicks came from rented servers

- **NHI makes non-readers look engaged**

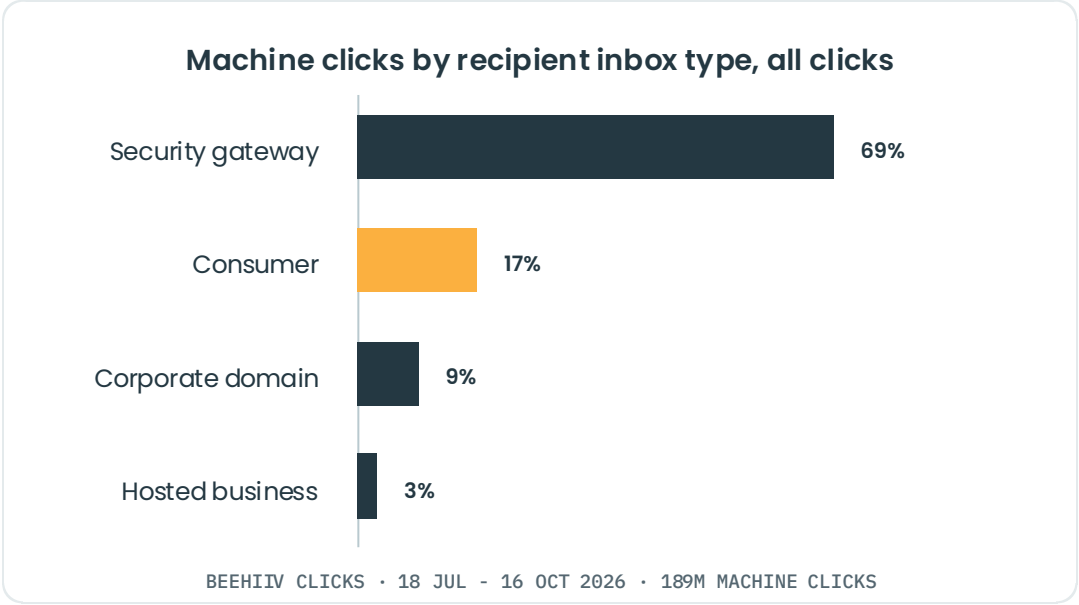
Two kinds of machines

お金に無関心な機械と、お金を狙う機械

ALL MACHINE CLICKS

Most bot clicks aren't criminals

機械クリックの大半は企業のセキュリティスキャナー



- **~80%** land in business inboxes behind security scanning
- Scanners click once to check; **malicious bots repeat clicks for money**
- So paid ad clicks skew toward **fraud**, as the ad-network numbers show

CASE: LINK SCANNING

The newsletter only machines read

22万9千クリックのうち、個人の受信箱からは5件

229,000

ad clicks in 13 weeks, one family of newsletters

5

came from consumer inboxes

- A list built from **business addresses** earns from the scanners that protect them

CASE: SYNTHETIC READERS

Eleven readers, one person

11人の「読者」が広告収益の82%を生み出した。全て人間に見えた

- 11 "readers" produced **82%** of two newsletters' ad revenue
- ~600 ad clicks each, every issue, for **12 weeks**
- Every single click **looked human**

82%

of ad revenue from 11 accounts. Real phone, real home connection, human timing.

CASE: IDENTITY FARMS

Industrialised identities

使い捨てメールアドレスを大量に使う不正

- Free, disposable inboxes: **hundreds** of fake readers, one operator
- Subscribed to **hundreds** of newsletters
- Clicking **days** after delivery, when nobody is watching

DETECTION

Why simple rules fail

教科書的なルールでは、不正の96%以上を見逃す

- The textbook rule is almost always **right**, and almost always **silent**
- Where the money is, it misses more than **96 bots in every 100**
- Seeing it takes a view **no single click** can give you

>96%

of machine clicks in consumer inboxes pass the common "too fast to be human" rule

QUALITY

We audit ourselves

すべての判定を誤検知・見逃しの両面から検証

- ✓ Every verdict checked for **false positives** and **false negatives**
- ✓ Measured false positives: **well under 1%**
- ✓ What we miss today becomes **tomorrow's detection**

BEEHIIV · MITIGATIONS

How we fight back

beehiivの対策：登録時、リスト、クリック

1 At signup

- Identity risk scoring
- Risky accounts can't send

2 At the list

- Bot scoring on forms
- Import and spam-trap checks

3 At the click

- NHI filtered before payout
- Honeypots and botnet detection

- **2026: 10,618 new accounts flagged, 329 blocked for ad abuse**

Enforcement is a ladder, not a switch

段階的な措置：警告から停止まで

1

Warn

Automated warning notifications

2

Demonetize

Remove monetization opportunities

3

Escalate

Gradual enforcement after warnings

4

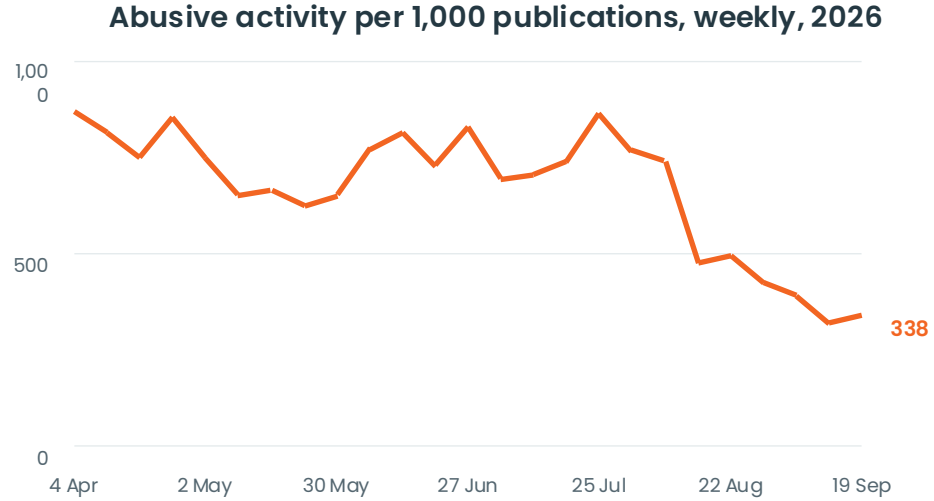
Ban

Ban the account

DETERRENCE

Does detection change behaviour?

検知の導入後、不正は半減。さらに今夏ほぼ半減



APR-SEP 2026 · WORDING ON CAUSES PENDING THE PLATFORM'S TIMELINE

- Abusive traffic **halved** within months of detection having consequences
- Fell by almost **half again** this summer
- Machine share didn't fall: **scanners** aren't deterred

The hard part is the conversation

難しいのは対話：顧客の感情とCPM対CPC

SENTIMENT

Managing customer sentiment

Keeping publishers on side while their numbers drop

PRICING

CPM vs. CPC arguments

Pay per view or pay per click, when both can be machine-made

TAKEAWAYS

Five things to take home

5つのポイント

1. **NHI is not one thing: treat each kind differently**
   NHIは一種類ではない
2. **Most bots are innocent, and still expensive**
   大半は無害、それでもコストがかかる
3. **The fraud that matters looks human**
   重要な不正は人間に見える
4. **Design for machines clicking first**
   機械が先にクリックする前提で設計する
5. **Track abuse separately from NHI**
   不正はNHIとは別に計測する

THE ASK

For mailbox providers

メールボックスプロバイダーへの提案

- Keep scanners disguised: share NHI rates **in aggregate, after the fact**
- One-click unsubscribe (RFC 8058): **keep it POST**
- Scanner-triggered unsubscribes: **let's measure them together**

Q&A

Questions?

ご質問をどうぞ

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