

# The cost of Lost Revenue Opportunities

How bots and invalid users are  
disrupting online customer acquisition

June 2021



# Foreword

## Lior Frenkel, Chairman of the Israel Cyber Forum

Recent years have seen advanced cyberattacks become the norm. Attack techniques, tools and technologies, traditionally solely accessible to governments, have leaked out. Today, they are readily available to serve criminal agents and support the rapidly growing cybercrime sector.

This trend, which will not end in the foreseeable future, is clearly demonstrated by the proliferation of ransomware attacks, advanced attacks by non-state actors, a focus on national critical infrastructures, and the growing sophistication of attacks with criminal motivations.

Within digital marketing and ecommerce, it is evident that this rise in adversaries' cyber capabilities is resulting in direct, and evident revenue loss to businesses across the globe. The impact is stark: producing higher customer acquisition costs, which end up reducing the bottom-line performance.

Furthermore, fake user accounts and bots, blur the view of organizations, skewing forecasts, revenues and pipeline. This represents a growing cyber security concern. This is a challenge that must be dealt with, sooner, rather than later.

This report highlights the impact and actual revenue loss, occurring from bots and fake users. We see a clear conclusion that bots and fake users are a major challenge for businesses and future economic performance. This is a challenge that must be



# Background

## Revenue Opportunities missed due to bots and fake users

Traditional revenue loss forecasting is often factored into companies long-term thinking. This traditionally includes account of new regulations or other drops in demand depressing revenue opportunities for companies.

However, invisible, and unforeseen is the lost revenue opportunities by filling funnels and analytics with bots, rather than real customers. These lost revenue opportunities happen when a company makes less revenue than expected due to fake or bot users in customer acquisition.

In this report, we show, through six sectors, how companies face a rising problem of lost revenue opportunities through this rising influx of bots and fake users.

The net effect is that businesses seeking to win customers through digital acquisition are leaving money on the table capturing bot attention and fake users instead of real eyeballs.

For the first time, we reveal the revenue opportunities and customers lost as a result of rising bot invasions accessing funnels. This is achieved through analysis of customer acquisition spend in six vital online customer acquisition markets – automotive, ecommerce, education, online gambling, SaaS, and travel. Factoring in sector specific data, in association with each industry's core customer acquisition metrics, it is revealed how the elimination of bots and fake users would create more than **\$42 billion** in uplift globally, based on an additional **2.5 billion** customer transactions.

# 42 billion

**In global revenue uplift**

# Methodology

We consider lost revenue opportunities lost through calculating the present levels of customer acquisition in six sectors: automotive, ecommerce, education, online gambling, SaaS, and travel. These sectors are assessed based on widely used metrics used by these industries. Firstly, "**customer acquisition costs**". These are marketing costs for digital spend annually per sector divided by the number of new customers. This reveals how much it costs for an average company in a sector to acquire a new customer. In turn, we analyze **Cost of Customer Acquisition compared to Lifetime Value** – that is how much money a customer will bring on average throughout their entire time as a paying customer. For example, if there is a CAC to LTV ratio of 1:5 this means that for every dollar spent on acquiring

customers, businesses get back 5 dollars over the lifetime of that customer.

Finally, calculations of **revenue opportunity lost (ROL)** for each sector is based on the average percentage of invalid traffic found in this paid customer acquisition funnel (for instance 3% in ecommerce). The Revenue Opportunity Lost is the net additional customers that should have been acquired with bots and fake users removed from marketing and acquisition spend multiplied by the average Lifetime value (LTV). This shows the revenue opportunity resulting from the same ad spend reinvested in customer acquisition, with fake users eliminated. The analysis of bot activity and fake users is based on CHEQ's more than 8000 customers, and other proprietary, and public data on digital ad spend and LTV for each sector.



# Revenue Opportunities Missed By Sector

A stylized, light purple silhouette of a car is centered on the page. Overlaid on the car and extending to the right are several circuit-like lines in a slightly darker shade of purple. These lines start from the car's body and branch out, ending in small circles, resembling a printed circuit board (PCB) layout. The background is a solid dark purple.

Lost Revenue Opportunities

# Automotive Sector

# Automotive: Overview

The auto industry is set to spend [13 billion](#) on digital advertising in 2021. This is being used to acquire car buyers, with the reward of \$50,000 for a dealership in lifetime value of a [loyal customer](#). However, 3% of automotive online customer acquisition it turns out are bots and fake users. If these fake users were eliminated with blocking of bad traffic, and existing spend repointed to real customers, this would represent an uplift of 19,613 new car deals. Or \$981 million extra revenue for the automotive sector. Broken down into individual countries the extra customers and revenue uplift in the UK automotive sector would be \$195million revenue, for Australia's car market \$36.9 million extra revenue, and \$49million for Japan's domestic car business.

Further benefits would accrue. Data relied upon by demand generation leaders would be cleaner. In the [words](#) of one senior executive in automotive manufacturing: "We do not have any real insight into the true performance of the Wild West that still defines our top of the funnel media spend. We spend a huge amount on media and at least 20% is unaccounted for." This data is vital in performance marketing campaigns but can be skewed. [Nissan](#) for instance adopts a strategy of identifying where upper and lower-funnel conversions have a long-term higher likelihood of leading to an eventual purchase according to Anouar Zaiane, Search Director at Nissan United Europe. Each lost click or impression is one less genuine user who can become a customer.

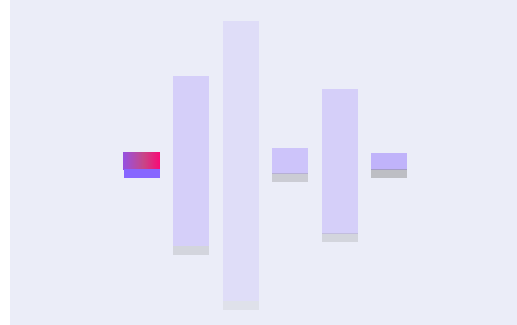
# Automotive: In numbers

Annual customer acquisition spend online



**\$ 13 billion**

CAC To LTV Ratio



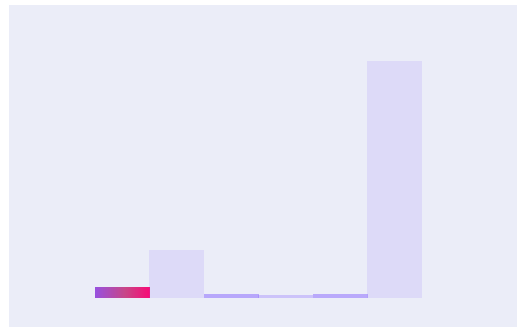
**\$ 1:2**

Bots in funnel



**3%**

New customers after bots removed



**19,613**

**Revenue uplift** after elimination of invalid traffic

**\$ 981 million**





Lost Revenue Opportunities

# E-commerce Sector

# E-commerce: Overview

Online retailers are familiar with e-commerce attacks hurting online transactions and business revenue. Successful monthly fraud attempts increased on average by up to [48 percent](#) for mid-sized and large e-tailers in the United States. However little tackled is the effect of customer acquisition fraud in channels designed to secure new customers. The unit economics of ecommerce means that money spent more smartly can reap major advantages. Overall a massive \$27 billion is spent globally by ecommerce players on paid acquisition (our figures exclude Amazon). For best-in-class ecommerce companies, average customer lifetime value is \$3600 in ecommerce, and the industry average is \$1300.<sup>1</sup>

<sup>1</sup> [2015 Ecommerce Growth Benchmark Report - RJMetrics](#)

<sup>2</sup> [CHEQ: The Economic Cost of Fake Reviews \(2021\)](#)

The CAC to LTV payoff is high in ecommerce, but bots are infiltrating funnels at a rate of 3% . This sees a losses to e-commerce of a staggering 18.4 million customers when bots instead of real consumers click. These missing customers in ecommerce represent a revenue uplift or customer lifetime value of \$16.6 billion uplift. This would be a pleasing top up to the [\\$26.7 trillion](#) ecommerce sales since COVID-19. Digging deeper, CHEQ has bots represent one in 50 visits arriving to the order pages derived from paid customer acquisition. Once given a leg up into the funnel, these revenue-limiting customer acquisition frauds also stor eup familiar ecommerce attacks including false declines, chargebacks, "card not present" attacks, and dropping of bot fake reviews<sup>2</sup>. This bot activity clogs up online baskets, causes logistical and refund challenges, and skews vital metrics.

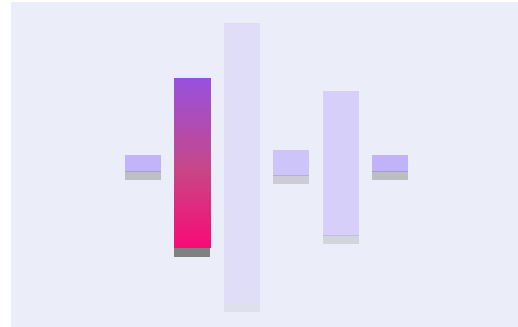
# E-commerce: In numbers

Annual customer acquisition spend online



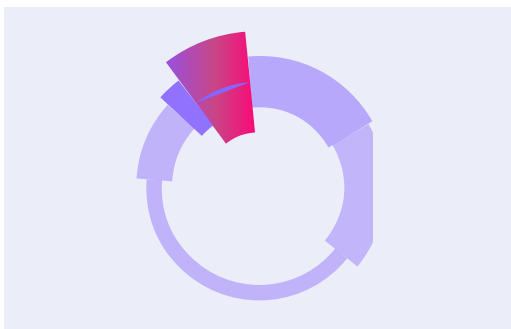
**\$ 27 billion\***

CAC To LTV Ratio



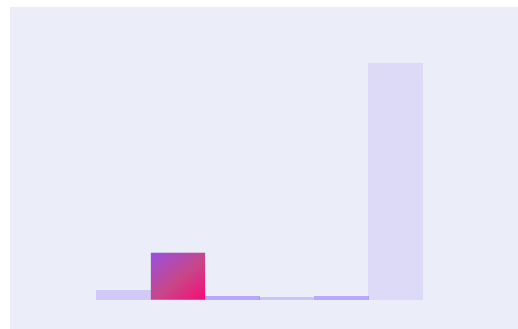
**\$ 1:20**

Bots in funnel



**3%**

New customers after bots removed



**18.4million**

**Revenue uplift** after elimination of invalid traffic

**\$ 16.6 billion**

\* Discounting Amazon's spend



Lost Revenue Opportunities

# Education Sector

US only

# Education: Overview

The education sector is facing a bill of at least \$420 million in wasted spend. This is because on average 6% of clicks are not from students, but bots. In the light of revenue opportunity framing, colleges should be acquiring 225,000 more students by eliminating bad clicks across their online acquisition efforts. This proposed clean up of customer acquisition comes at a critical time for higher education when [McKinsey](#) suggests that US universities could see a drop of up to 20% in the fall of 2021, dealing with a \$19 billion revenue loss from lost tuition and fee revenues alone. Our research found that the long-term benefit of replacing bots and fake users with real students is worth \$14.8 billion. This represents a decent top up on these losses.

The prospect for increased revenue through online customer acquisition is so large given the high price of courses. In the US alone, education institutions spend \$7 billion annually on digital paid customer acquisition to acquire 3.5 million students at \$1985 Customer (or more properly, Student) Acquisition Cost given the high price of a student enrollment.

In fact universities have ramped up their customer acquisition spending making the attack surface larger. Higher ed Facebook advertising [increased 7%](#) during the pandemic compared to the same 10-week period compared to the previous year. The average Facebook ad spend was \$131,402 per institution, or about \$54,000 per month.

Moreover, the revenue opportunity losses are higher still if indirect costs are factored in. Representatives at colleges spend hours, or days in some cases, reaching out to fake leads generated by bots. This includes bots and generating fake (or real) consumer names and phone numbers. Universities have a "speed of lead" playbook to get back to potential students filling in forms (SNHU representatives typically return [98 percent](#) of new lead calls in under three minutes according to Paul LeBlanc, Southern New Hampshire President). But increasingly forms filled turn out to be simply bots using stolen or junk details. In the words of one university marketing head: "We were getting a lot of bad email addresses and a lot of bad phone numbers and even the same bad email addresses a lot of times in the same day."

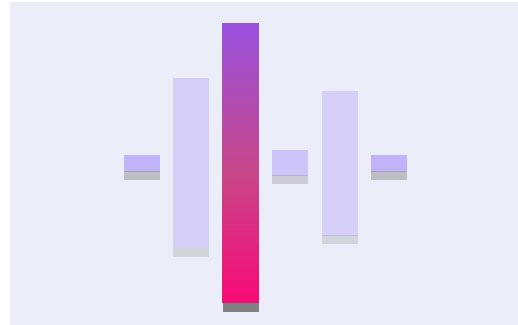
# Education: In numbers

Annual customer acquisition spend online



**\$ 7 billion**

CAC To LTV Ratio



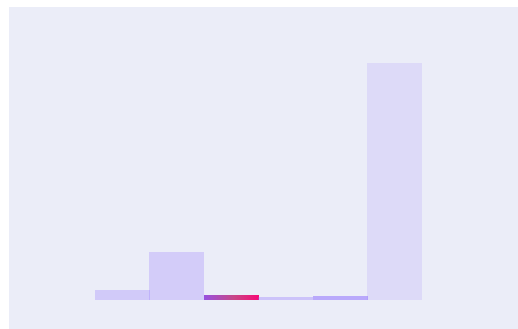
**\$ 1:33**

Bots in funnel



**6%**

New customers after bots removed



**225,000**

**Revenue uplift** after elimination of invalid traffic

**\$ 14.8 billion**

A large, stylized graphic in shades of purple and pink. It features a roulette wheel on the left side, with several segments highlighted in a darker shade. To the right of the wheel, there are several horizontal lines that resemble circuit board traces, each ending in a circular node. The overall design is modern and tech-oriented.

Lost Revenue Opportunities

# Gambling Sector

# Gambling: Overview

The online gambling industry's digital spend annually amounts to £747m on direct online marketing and £301m through "affiliate" website such as tipsters. Overall, at present \$1.7 billion is spent online by those running gambling sites and apps, acquiring 5.8 million customers a year, our research reveals. The sector has a roughly 3x CAC to LTV ratio, bringing an average of \$1129 per customer in average lifetime value. With higher-than-average 14% invalid bot and fake users in the funnel, the effects on potential growth are stark. If bots were eliminated from customer acquisition channels, online gambling would win an additional 791,000 more customers. This amounts to a revenue uplift of \$893 million.

## Fake users threaten future growth of online gaming

This finding of money left on the table comes at a crunch time for online gaming customer acquisition in a market which is expected to hit 117.3 billion by 2025.<sup>3</sup> With relatively high customer acquisition costs any lost games to bots (bots are found to play thousands of free games) this means diminishing returns at a time when customer acquisition is king.

Martin Calvert, Marketing Director at Blueclaw, a search-led digital marketing agency driving player acquisition for operators and affiliates says: "There just aren't as many new customers as they used to be play acquisition remains a vital concern." In its 2020 annual report, William Hill remained conscious of having better and "more efficient customer acquisition in its strategy". Some of the biggest spenders on paid media include DraftKings (\$93 million paid media from January to September 2020, Fan Duel (\$61.2 million), BetMGM (\$8.1 million), William Hill (\$1.2 million) and PointsBet (\$730,000).<sup>4</sup>

Rising gambling bot attacks through customer acquisition channels have for instance affected affiliates, where a main aim for these pages is for the user to "click out" and sign up with an operator. Due to an arsenal of digital threats, from networks of bots to [click farms](#), online gambling has faced new threat levels of sophisticated attacks on ad budgets with real users, replaced with fakes. This has for instance seen bot attacks hit at 5am in a bid to wipe out ad spend early in the morning. Not dealing with this bot and fake user play represents a gamble of future revenue.

<sup>3</sup> H2 Gambling Capital, February 2021

<sup>4</sup> Kantar data/ Ad Age: The US sports betting race is on – and many marketers want a piece of the action, January 14, 2021



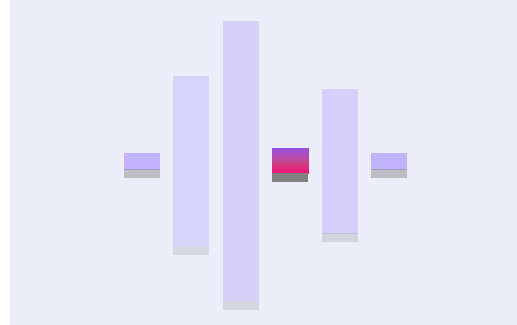
# Gambling: In numbers

Annual customer acquisition spend online



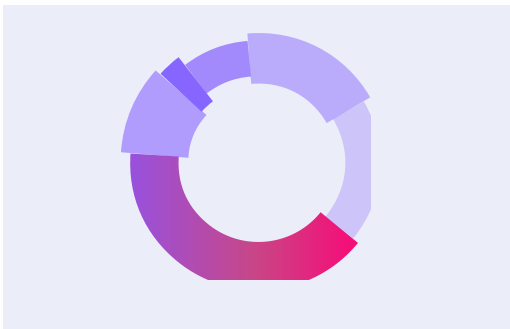
**\$ 1.7 billion**

CAC To LTV Ratio



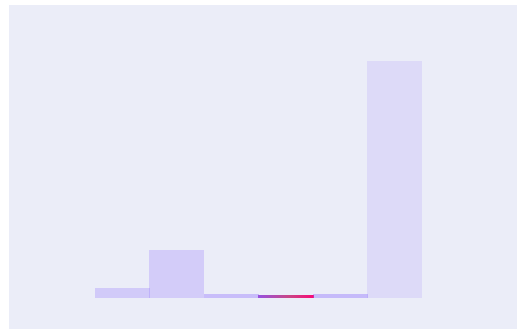
**\$ 1:3**

Bots in funnel



**17%**

New customers after bots removed



**995,000**

**Revenue uplift** after elimination of invalid traffic

**\$ 1.1 billion**



Lost Revenue Opportunities

# Saas Sector

# SaaS: Overview

The [\\$118 billion](#) SaaS industry spends \$5.7 billion through paid customer acquisition channels to acquire 16.7 million customers globally. This represents the gamut of subscriptions from tens of dollars to hundreds of thousands of dollars. The amount of revenue opportunity is based on an industry figure of [\\$341](#) in Customer Acquisition cost and an average lifetime customer value of \$6000. However, 7% of the funnel generated by the digital advertising machine in SaaS turns out to be bots and fake users. If the same skill and digital targeting were spent on real buyers, the SaaS industry would see 1.3 million new customers, or an extra \$7.5 billion in extra revenue globally. Of this large figure, the largest SaaS market of the US would see \$5.1 billion share of this bot-eliminated revenue. Cincinnati-based leading human Capital Management SaaS platform, Paycor, worked with CHEQ over time to replace invalid bot clicks with authentic human users. By eliminating invalid clicks, Paycor saw a 400% increase in first-time meetings booked from their customer acquisition campaigns while increasing Sales Qualified Leads by 50%.

In this case, 4.5% of paid clicks entering the Paycor funnel were invalid. Bots were found to autofill lead forms, and some campaigns on certain platforms saw invalid click levels as high as 11%. "Once spend was rerouted spend towards valid users, lead quality rise considerably" says Alex Schutte, Paycor's Head of Digital Marketing Strategy.

Based on a cross-section of SaaS companies monitored for invalid traffic, the problem emerges of company-expensed bots filling out free trials, signing up for demos or "beginning pilots". Specifically after clicking a SaaS customer acquisition ads, 60% of bots go on to access a recorded demo, 18% head to the pricing page, 9% opt for a free trial, and 3% ask for a demo.

Naturally, bots do not have intent or [BANT](#), and definitely don't champion a multi-stakeholder, complex B2B sale over a 90-180-day sales cycle. Marketers celebrate that they are collecting "leads" that firmographically fit the ideal customer profile. But this proves an expensive, inefficient proposition when you are spending \$100-\$300 per "lead" with SDR left to sift through the junk.

# Saas: In numbers

Annual customer acquisition spend online



**\$ 5.7 billion**

CAC To LTV Ratio



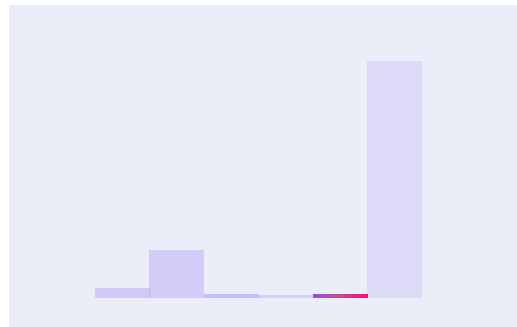
**\$ 1:17**

Bots in funnel



**7%**

New customers after bots removed



**1.3 million**

**Revenue uplift** after elimination of invalid traffic

**\$ 7.5 billion**



**Lost Revenue Opportunities**

# **Travel Sector**

# Travel: Overview

Predictably, global travel and tourism digital customer acquisition spend in 2020 was depressed, with spend down 33.8%. Nevertheless, online travel customer acquisition is projected to be one of the fastest-growing sectors in 2021. Digital customer acquisition – 54% of all customer acquisition for the sector – is set to reach **\$12.3 billion** in 2021 as travelers return to the air, sea and guesthouses. To put this digital customer acquisition footprint in context, close to 50% of annual expenses for high-profile travel firms like Trip Adviser involve selling and marketing, while in the hotel sector up to 25% of guest paid revenue is spent on customer acquisition.

However, with online travel suffering a rate of 5% invalid clicks on ads from bots and fake users, we find that if these billions of invalid clicks were eliminated, this could bring a net uplift of 92.4 million customers for online travel d. At current CAC and lifetime value this amounts to an uplift of \$1.3 billion to global revenue. Bot-eliminating revenue growth is a particularly valuable differentiator for demand gen teams in the price-driven hyper-competitive travel ecosystem facing an unending push for low prices and tight profit margins.

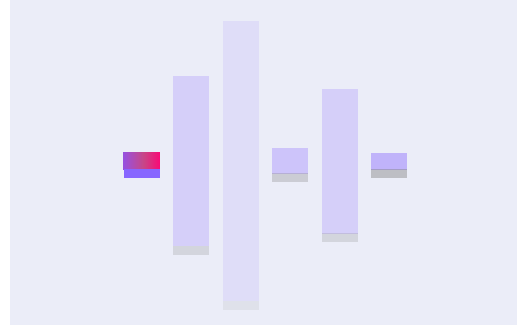
# Travel: In numbers

Annual customer acquisition spend online



**\$ 12.3 billion**

CAC To LTV Ratio



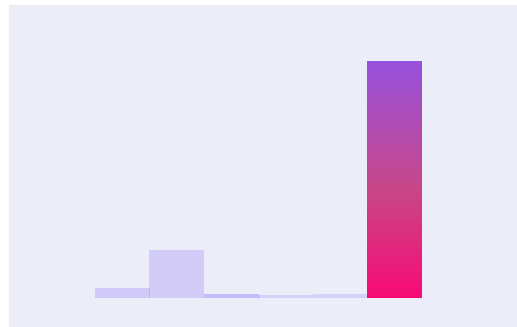
**\$ 1:2**

Bots in funnel



**5%**

New customers after bots removed



**92.5 million**

**Revenue uplift** after elimination of invalid traffic

**\$ 1.3 billion**



# Revenue Opportunities Missed By Country

Here we see across these sectors (automotive, e-commerce, education, gambling, SaaS, and travel), that the uplift for businesses would be \$42.3 billion in uplift if bots were eliminated and current customer acquisition spend was targeted at real online buyers. This amounts to 2.5 billion potential customer transactions. The next series of figures break this enormous figure down into sectors for four countries spending the most on online customer acquisition and revenue missed out on through ongoing targeting of bots and fake users.



# United States:

## SaaS

**Revenue uplift** after elimination of invalid traffic

**\$ 5.1 billion**

## E-commerce

**Revenue uplift** after elimination of invalid traffic

**\$ 10.7 billion**

## Travel

**Revenue uplift** after elimination of invalid traffic

**\$ 341 million**

# United Kingdom:

## Automotive

**Revenue uplift** after elimination of invalid traffic

**\$ 5.1 billion**

## Gambling

**Revenue uplift** after elimination of invalid traffic

**\$ 10.7 billion**

## E-commerce

**Revenue uplift** after elimination of invalid traffic

**\$ 341 million**

# Australia:

## Gambling

**Revenue uplift** after elimination of invalid traffic

**\$ 74 million**

## Automotive

**Revenue uplift** after elimination of invalid traffic

**\$ 36.9 million**

## E-commerce

**Revenue uplift** after elimination of invalid traffic

**\$ 855 million**

# Japan:

## Automotive

**Revenue uplift** after elimination of invalid traffic

**\$ 9 million**

## E-commerce

**Revenue uplift** after elimination of invalid traffic

**\$ 2.1 billion**

# Bots and lost revenue opportunities

The bots found to be attacking paid customer acquisition, and causing long term revenue opportunities to be missed, include the following.

**Spambots**

**Scrapers**

**Automation Tools**

**Frequency Capping**

**Abnormal rate limit**

**Excessive rate limit**

**Disabled JavaScript**

**Behavioral anomalies**

**Click Farms**

**Malicious Bots**

**False Representation**

**Account takeover**

**Data Centers**

**VPNs**

**Proxy**

**Disabled Cookies**

**Click Hijacking**

**Network Anomalies**

**Known Bots (PPC Crawlers)**

Seen through the lens of revenue opportunity lost, these fake and malicious users, though representing a significant chunk of customer acquisition traffic, carry no potential to become a customer. Even known bots, or "good" bots, such as PPC crawlers, wreck demand generation strategy - though not carrying out malicious attacks. Nevertheless, good or not, these sources of invalid traffic will maintain an average conversion rate close to zero.

Assaf Dar CHEQ Chief Product Officer says: "There are essentially three attacks happening in customer acquisition: bots, malicious users and suspicious users. In the case of bots, they need to be blocked from entering the customer acquisition journey. However, when it comes to suspicious clicks, of course, not all visitors that look fake are indeed fake. In these cases, it does not automatically mean we need to block everything. This monitoring takes some time, and some calibration."

We see this for instance with the use of data centers to hide activity, where there are both legitimate data centers

and others that campaigns should avoid because of their quality score and proven reputation for sourcing invalid clicks."

Overall, the impact of removing bots from the e-commerce equation is powerful, providing long-term growth built upon real foundations. Though the overall numbers discussed here are very large dealing with entire global or country sectors, the impact of eliminating bots from customer acquisition for individual businesses can be lifechanging. For instance, reinvesting \$14000 spent on bot clicks and replacing them with real human customers is expected to bring the average e-commerce player 163 additional customers a month.

Eliminating fake users and bots from customer acquisition is not simply a means towards being smarter with money spent to acquire customers. By unblocking customer acquisition channels, it offers an economic opportunity to book billions more sales and customers, allowing all companies to reach their full revenue potential.

**To learn more visit**  
**[www.cheq.ai/research](https://www.cheq.ai/research)**

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