UCL IIPP Institute for Innovation and Public Purpose

Digital Economy Research Showcase

Algorithmic Rents

12 October, 2023

Contents

Algorithmic Rents - An overview

Tim O’Reilly

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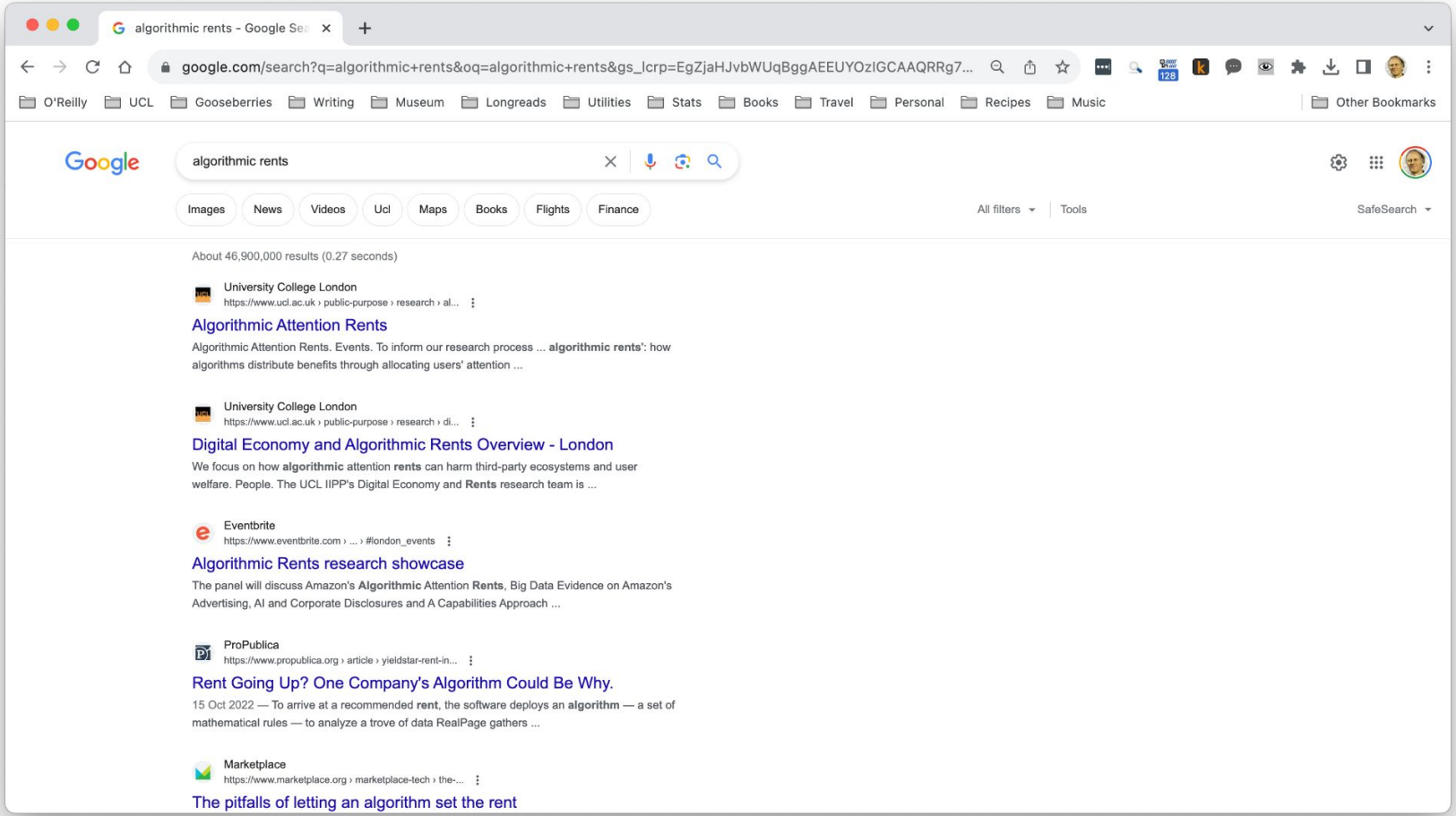
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Algorithmic Attention Rents
Algorithmic Attention Rents. Events. To inform our research process ... algorithmic rents': how algorithms distribute benefits through allocating users' attention ...
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Digital Economy and Algorithmic Rents Overview - London
We focus on how algorithmic attention rents can harm third-party ecosystems and user welfare. People. The UCL IIPP's Digital Economy and Rents research team is ...
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Algorithmic Rents research showcase
The panel will discuss Amazon's Algorithmic Attention Rents, Big Data Evidence on Amazon's Advertising, AI and Corporate Disclosures and A Capabilities Approach ...
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Rent Going Up? One Company's Algorithm Could Be Why.
15 Oct 2022 — To arrive at a recommended rent, the software deploys an algorithm — a set of mathematical rules — to analyze a trove of data RealPage gathers ...
Marketplace
https://www.marketplace.org › marketplace-tech › the-...
The pitfalls of letting an algorithm set the rent

A marvel of market coordination

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- Trillions of web pages
- Billions of searches
- Producer and consumer matched in fractions of a second by a proprietary “invisible hand” that takes hundreds of factors into account to find the most relevant result for each search.
- Other internet services, like Amazon, Facebook and other social media platforms, App Stores, Uber, Spotify, and Netflix are also “matching marketplaces” that perform their own version of this magic.

Machines for managing our attention

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"In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it….

Filtering by intelligent programs is the main part of the answer."

Herbert Simon, 1970

Bounded Rationality

Simon: Users are not perfect “hedonic calculators.” They are “boundedly rational” “information processors” with their decisions shaped by the limits of human cognition.

- They do not “optimize,” they “satisfice.”
- They rely on heuristics and shortcuts, such as screen position, to aid in decision making.
- Behavioural economics adds: They are subject to cognitive biases

The “institutional context” of online decision making

Decisions are also shaped by the *institutional context* in which decisions are made. Today:

- Information is abundant, but the interface for acquiring it is limited: a small screen.
- What appears on that screen is managed by the designs and algorithms of a limited number of information gatekeepers.
- Those gatekeepers typically manage a two- or three-sided information marketplace consisting of users, suppliers (web sites, merchants, app developers, etc.) and advertisers (who may or may not also be suppliers.)
- *A platform’s third-party producers compete with each other, and advertisers compete with these producers and other advertisers for a fixed quantum of user attention.*

Value Creation and Value Extraction

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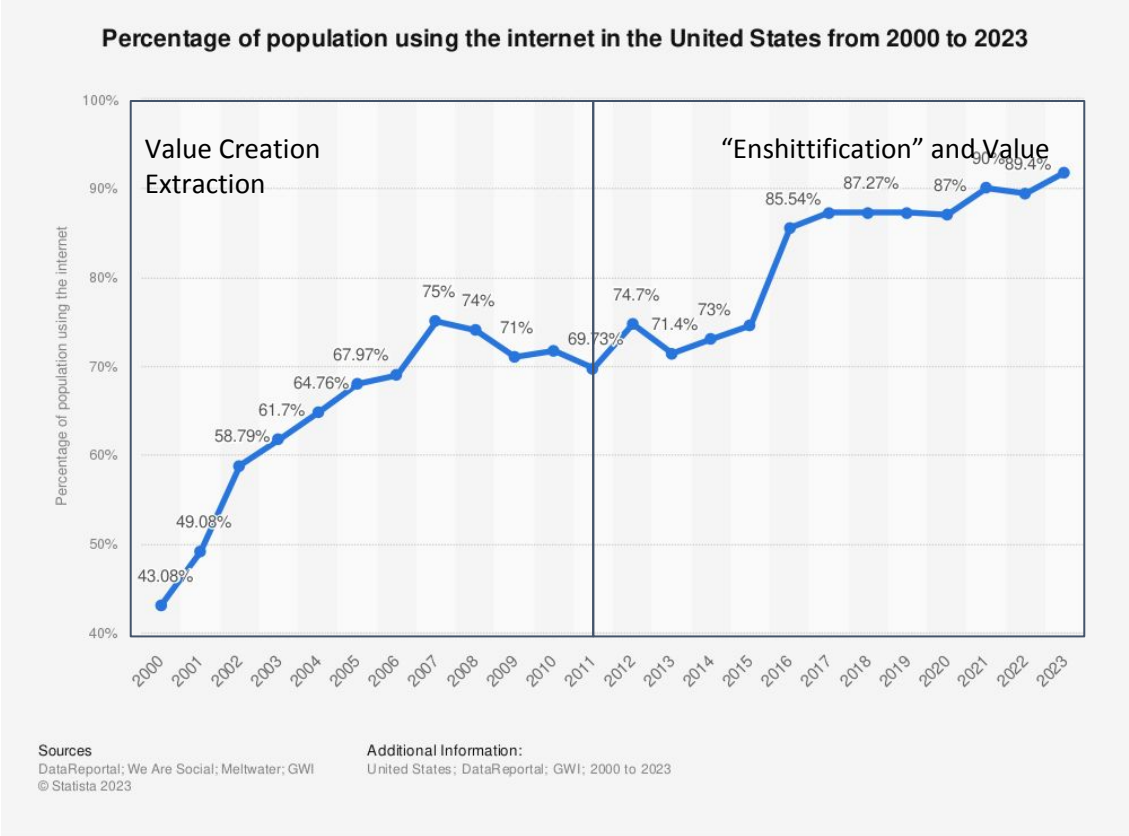
In the years of internet user growth, innovators compete for users, and the winners enjoy enormous “Schumpeterian profits.”

During the competitive period when user acquisition is paramount, gatekeepers are incentivized to provide results that are optimal for users.

Once growth stalls, they may extract rents.



How Attention Becomes Subject to Rent

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Attention is “a factor of production” that is limited in supply and can see its value appropriated by others than those who supply it.

By virtue of a platform’s dominance in a given attention market, it is able to appropriate an increasing share of the return to “attention” – including by providing lower-quality results, by charging a higher price than what the attention may be worth to those buying it, by forcing ecosystem participants to pay for visibility, or by trying to monopolise vertical product or service markets.

Algorithmic Attention Rents

Rents can be identified by deviations from the best possible attention allocations of which a platform is capable. In the search engine literature, these are referred to as “organic” results; that is, the results chosen as best by the platform’s own search or recommendation algorithms before any self-serving distortions.

How attention rents become economic rents

1. Train users to trust “algorithmic authority” by providing the best possible organic results.

1. Use that algorithmic authority to direct attention to products that benefit the platform (or its advertisers) rather than to the best results for the user.

1. Make organic search results harder to find, increasing the number of clicks that go to advertising.

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The Time Cost to Users

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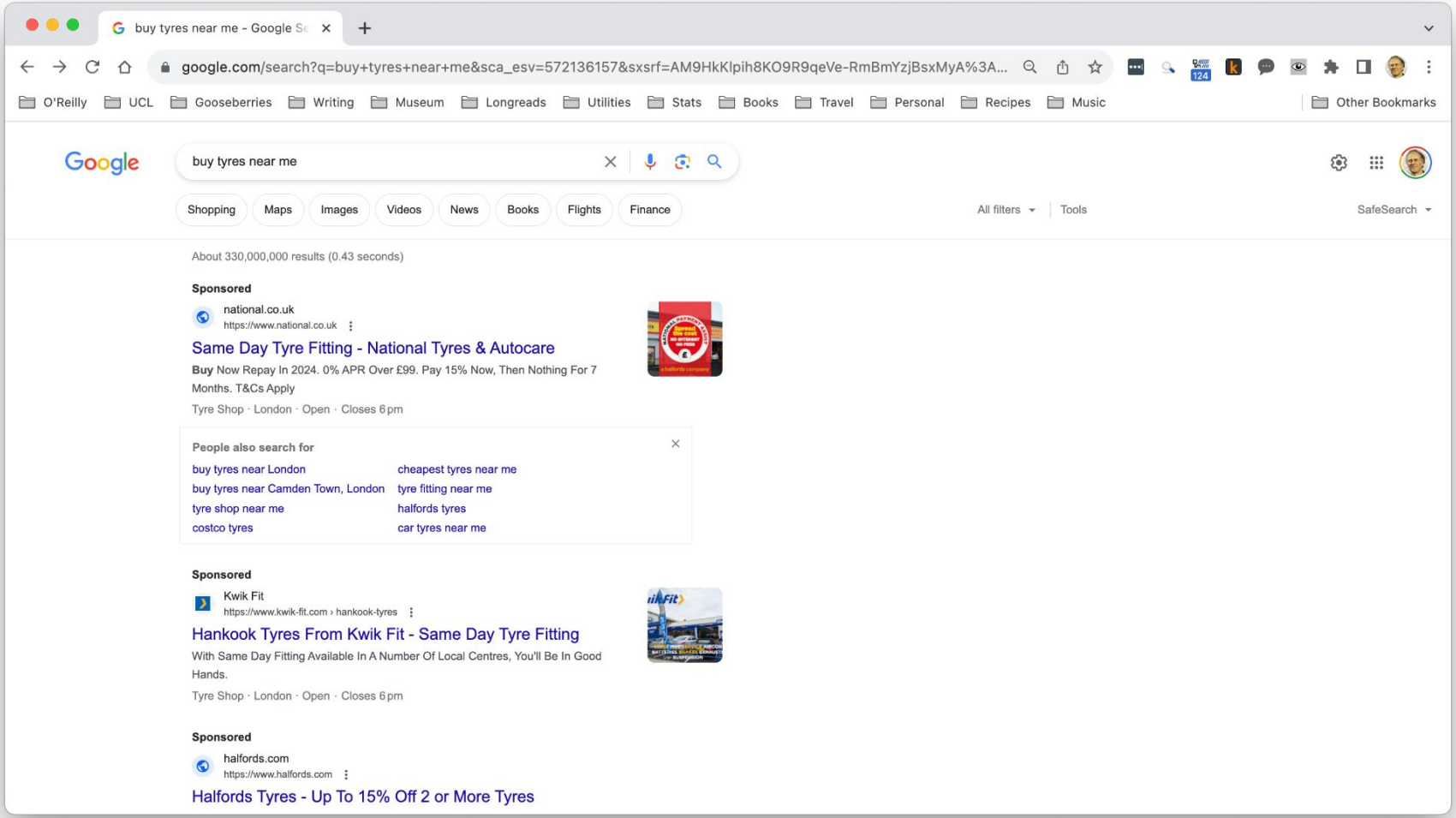
“In an information-rich world, most of the cost of information is the cost incurred by the recipient. It is not enough to know how much it costs to produce and transmit information; we must also know how much it costs, in terms of scarce attention, to receive it.”

Herbert Simon, 1970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Google
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Maps
Images
Videos
News
Books
Flights
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All filters
Tools
SafeSearch
About 330,000,000 results (0.43 seconds)
Sponsored
national.co.uk
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Same Day Tyre Fitting - National Tyres & Autocare
Buy Now Repay In 2024. 0% APR Over £99. Pay 15% Now, Then Nothing For 7 Months. T&Cs Apply
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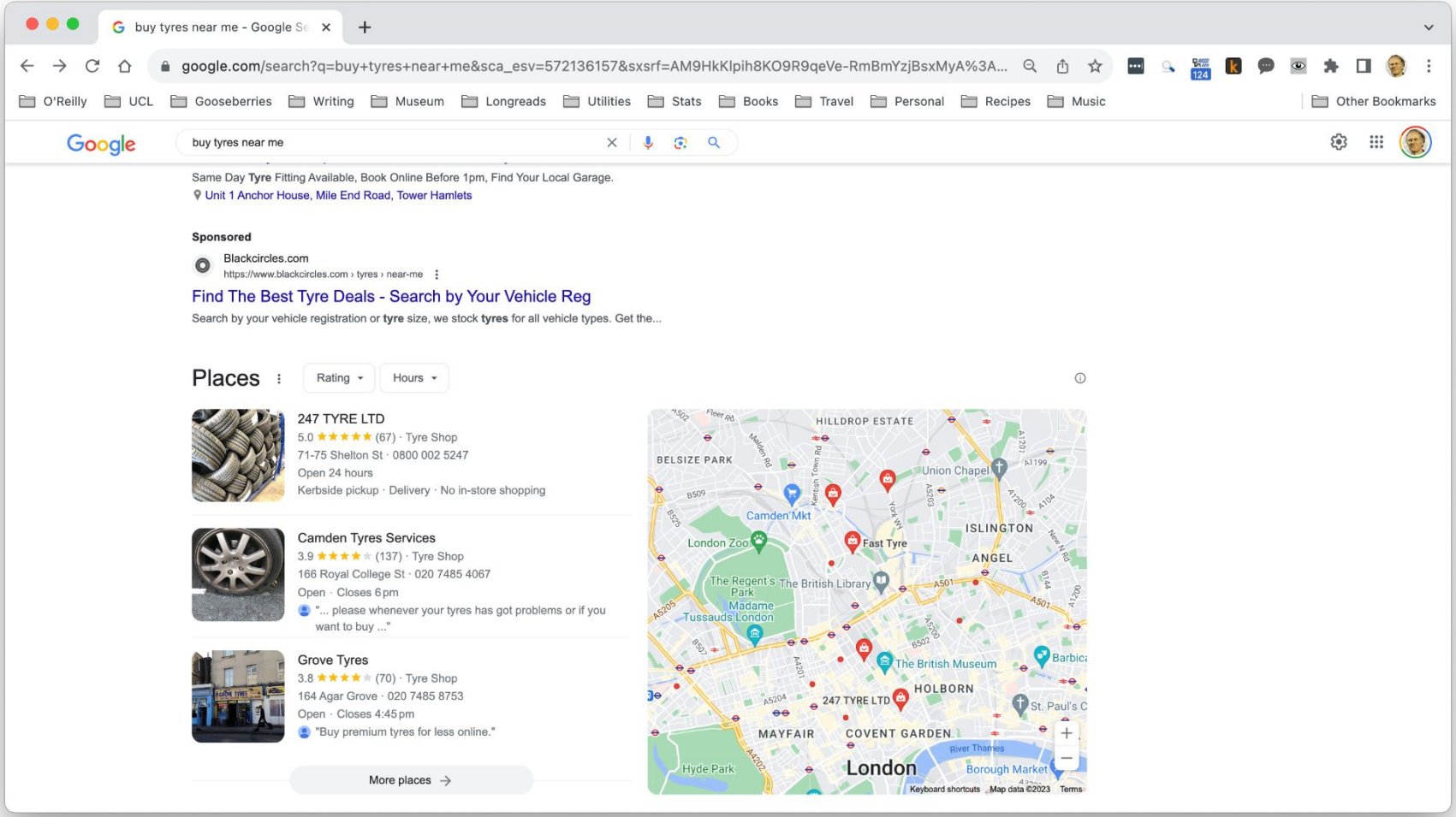
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71-75 Shelton St · 0800 002 5247
Open 24 hours
Kerbside pickup · Delivery · No in-store shopping
Camden Tyres Services
3.9 (137) · Tyre Shop
166 Royal College St · 020 7485 4067
Open · Closes 6 pm
"... please whenever your tyres has got problems or if you want to buy ..."
Grove Tyres
3.8 (70) · Tyre Shop
164 Agar Grove · 020 7485 8753
Open · Closes 4:45 pm
"Buy premium tyres for less online."
More places
HILLDROP ESTATE
BELSIZE PARK
Union Chapel
Camden Mkt
London Zoo
Fast Tyre
ISLINGTON
ANGEL
The Regent's Park
The British Library
Madame Tussauds London
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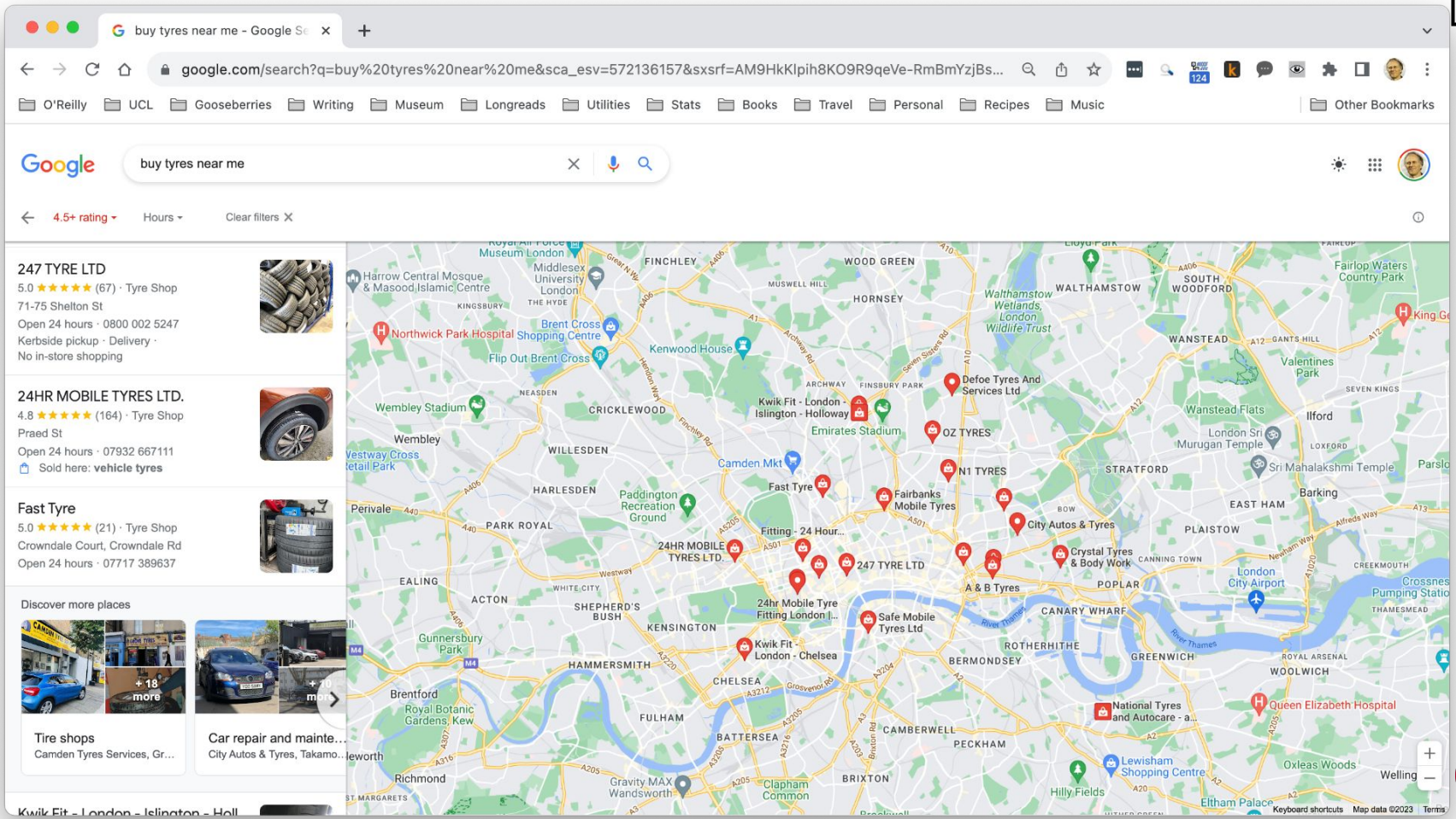
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4.8 ★★★★★ (164) · Tyre Shop
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Fast Tyre
5.0 ★★★★★ (21) · Tyre Shop
Crowndale Court, Crowndale Rd
Open 24 hours · 07717 389637
Discover more places
+ 18 more
Tire shops
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Car repair and mainte...
City Autos & Tyres, Takamo...
Kwik Fit - London - Islington - Holl...
Museum London
Harrow Central Mosque & Masood Islamic Centre
Middlesex University London
FINCHLEY
WOOD GREEN
HORNSEY
WALTHAMSTOW
SOUTH WOODFORD
Fairlop Waters Country Park
Walthamstow Wetlands, London Wildlife Trust
Northwick Park Hospital
Brent Cross Shopping Centre
Flip Out Brent Cross
Kenwood House
WANSTEAD
Valentines Park
Wembley Stadium
CRICKLEWOOD
Kwik Fit - London - Islington - Holloway
Defoe Tyres And Services Ltd
Emirates Stadium
OZ TYRES
Wanstead Flats
Ilford
Wembley
WILLESDEN
Camden Mkt
N1 TYRES
London Sri Murugan Temple
Sri Mahalakshmi Temple
Fast Tyre
Fairbanks Mobile Tyres
STRATFORD
HARLESDEN
Paddington Recreation Ground
Barking
EAST HAM
Perivale
PARK ROYAL
City Autos & Tyres
PLAISTOW
Fitting - 24 Hour...
24HR MOBILE TYRES LTD.
247 TYRE LTD
Crystal Tyres & Body Work
EALING
ACTON
SHEPHERD'S BUSH
KENSINGTON
24hr Mobile Tyre Fitting London |...
A & B Tyres
POPLAR
London City Airport
CANARY WHARF
Safe Mobile Tyres Ltd
Gunnersbury Park
Kwik Fit - London - Chelsea
ROTHERHITHE
HAMMERSMITH
CHELSEA
BERMONDSEY
GREENWICH
WOOLWICH
Brentford
Royal Botanic Gardens, Kew
FULHAM
National Tyres and Autocare - a...
Queen Elizabeth Hospital
BATTERSEA
CAMBERWELL
PECKHAM
Richmond
Gravity MAX Wandsworth
Clapham Common
BRIXTON
Lewisham Shopping Centre
Oxleas Woods
Hilly Fields
Eltham Palace
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Attention allocations drive value allocations…between and within platform sides

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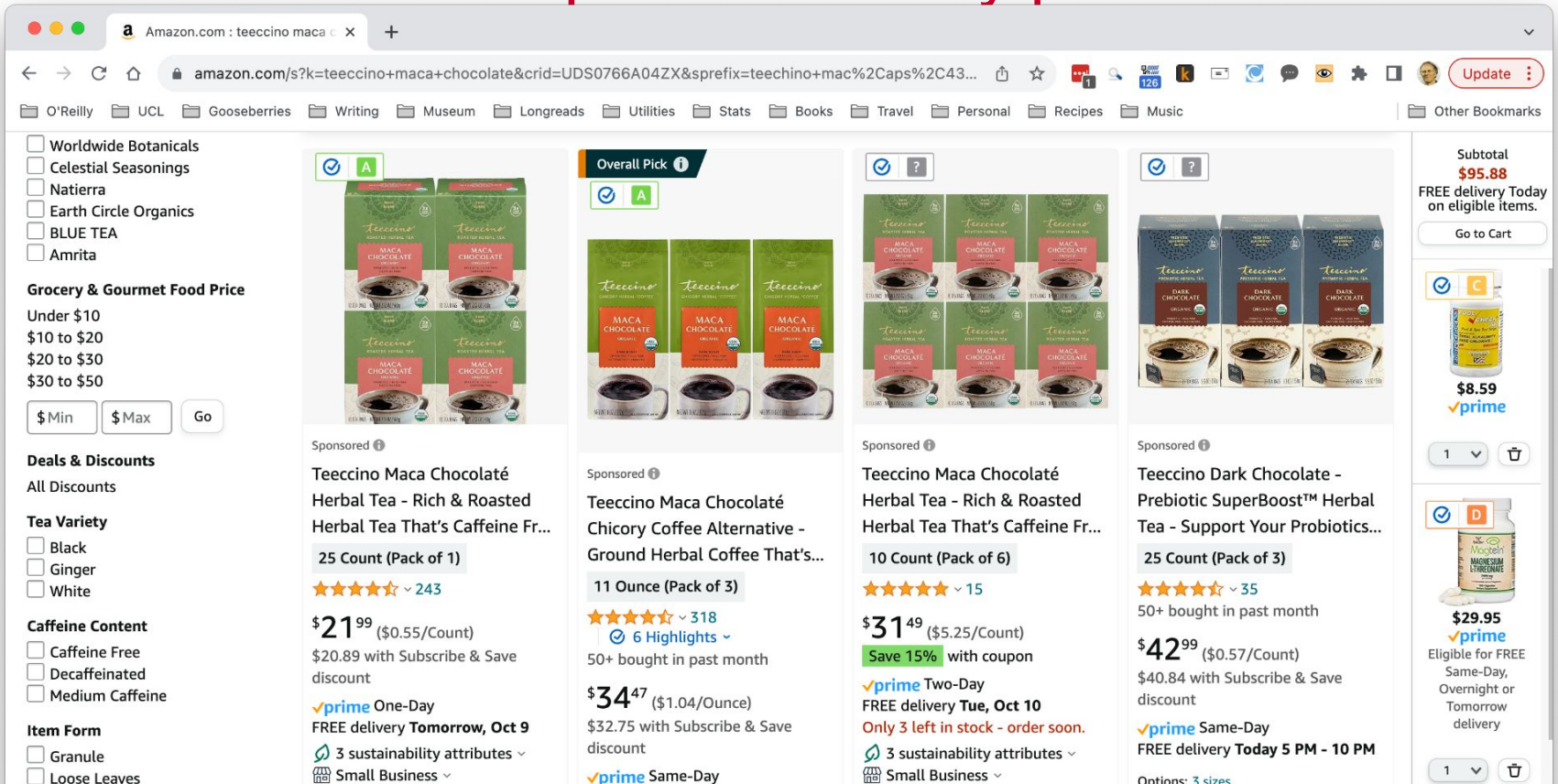
In allocating user attention, the platform is also shaping the allocation of economic value between competing stakeholders on the platform, including itself, its users, its third-party supplier ecosystem, and its advertisers. ***Attention allocations drive value allocations.***

Amazon allocates value to itself by placing an ad first even for an explicit search by product name



Amazon.com : teeccino maca

amazon.com/s?k=teeccino+maca+chocolate&crid=UDS0766A04ZX&sprefix=teechino+mac%2Caps%2C43...

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Diet Type
- Gluten Free
- Vegan
- Plant Based

Recommended Uses For Product
- Digestion
- Relaxation
- Sleep

Nutrition Facts Per Serving
- Fat Free (<0.5g)
- Low Fat (<3g)
- Free of Saturated Fat (<0.5g)
- Free of Trans Fat (0g)
- Cholesterol Free (<2mg)
- Sodium Free (<5mg)
- Sugar Free (<0.5g)
- Protein (>10g)

Calories Per Serving
- 0 Calories
- Up to 40 Calories
- 40 to 100 Calories
- 100 to 200 Calories
- 200 to 300 Calories

Fat Calories Per Serving
- <40 Calories

Business Type
- Small Business

Specialty Food Type
- Non-GMO
- Organic

Teeccino Maca Chocolaté Herbal Tea - Rich & Roasted Herbal Tea That's Caffeine Fr...

Black | 25 Count (Pack of 1)

4.5 ★ 739

4 Highlights

200+ bought in past month

$13.99 ($0.56/Count)

$13.29 with Subscribe & Save discount

prime One-Day
FREE delivery **Tomorrow, Oct 9**

Options: 2 sizes

3 sustainability attributes

Small Business

Add to Cart

Teeccino Chicory Coffee Alternative Maca Chocolate Ground Herbal Coffee That's...

Pack of 2

$22.99 ($1.05/Ounce)

prime One-Day
FREE delivery **Tomorrow, Oct 9**

3 sustainability attributes

Small Business

Add to Cart

More Buying Choices
$22.95 (2 new offers)

Overall Pick

Teeccino Maca Chocolaté Chicory Coffee Alternative - Ground Herbal Coffee That's...

11 Ounce (Pack of 3)

4.5 ★ 318

6 Highlights

50+ bought in past month

$34.47 ($1.04/Ounce)

$32.75 with Subscribe & Save discount

prime Same-Day
FREE delivery **Today 5 PM - 10 PM**

3 sustainability attributes

Small Business

Add to Cart

Teeccino Maca Chocolaté Herbal Tea - Rich & Roasted Herbal Tea That's Caffeine Fr...

25 Count (Pack of 1)

4.5 ★ 243

$21.99 ($0.55/Count)

$20.89 with Subscribe & Save discount

prime One-Day
FREE delivery **Tomorrow, Oct 9**

3 sustainability attributes

Small Business

Add to Cart

Subtotal
$95.88
FREE delivery Today on eligible items.

Go to Cart

$8.59
prime

1

$29.95
prime
Eligible for FREE Same-Day, Overnight or Tomorrow delivery

1

Platform dominance and attention

A platform’s dominance is reflected in its ability to shape user attention independently of user preferences, inputs, and the relevance of its third-party ecosystem's information.

Why Don’t Users Switch?

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In theory, “competition is just a click away.” But “the difference between theory and practice is always greater in practice than it is in theory.”

1. It is difficult and expensive to produce the best search results or recommendations. Thus, the gap between the market leaders and competitors is great enough that *there is room to make results worse for users without losing enough of them to make the worse results unprofitable*.
2. *Many of the harms are indirect, falling most heavily on the supplier or adviser ecosystem, and are only eventually passed on to the user.*
3. (Also, all the reasons outlined in the DOJ case against Google and the FTC case against Amazon.)

“Breaking Bad”

The big decision took place in 2016: should ads be allowed on the top half (“above the fold”) of the search results page, mixed in with organic results? And *“while he [Bezos] cautioned against alienating customers by serving too many ads, he opted to vigorously move forward, saying that any deleterious long-term consequences would have to be implausibly large to outweigh the potential windfall and the investment opportunities that could result from it.”*

Brad Stone, *Amazon Unbound*

And indeed, profits flowed…

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By 2022, Amazon's "advertising" (i.e. "pay to play") business had soared to nearly $38 billion in revenue, making the Marketplace arguably even more profitable than web services.

Our Empirical Study of Amazon Marketplace Advertising

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We scraped data from product search results (showing the product's price, its search rank, organic rank, size and screen position, and if it is an advert); and combined this with Amazon data from "Seller Central" showing the top-3 most clicked products for the same 2,250 search queries. Our final dataset includes 151,516 products, collected over 8 days in June 2023.

We found that the relevancy of a product (judged by its organic rank) and the product listing's relative position and visual prominence ("attention share") both strongly influence a product's probability of being a top-3 most clicked product. The "Amazon's Choice" badge also significantly increases click probability.

Among 69 product search results on an average page, a product with very little relevance (bottom 10) but high visual prominence (top 1% for "attention share"), is as likely to be clicked on as a super- relevant product organically ranked 35 slots higher (top-5 organic rank), but remaining stuck in relative visual obscurity the middle of the search results in (35 overall rank).

Measuring Algorithmic Attention Rents

1. *Comparing the organic ranking of a product with its paid ranking to determine the extent to which the platform is preferencing results that its organic algorithm shows are inferior.*
2. *Examining whether ads bring additional information to consumers.*
3. Comparing the quality of a dominant platform's organic algorithmic results with the organic allocations offered by other less dominant platforms that do face competitive pressures.
4. Examining whether or not the information (including results quality) that a business or consumer could reasonably expect to find in a competitive market is available.
5. Examining whether ads have increased (and organic output declined) beyond the level reasonably required for the platform to earn a competitive return on capital invested.

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Sources of Data for Such Analysis

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1. Breadcrumbs dropped in company annual reports, shareholder letters, annual meetings, conference proceedings, and so on.
2. Internal documents acquired via lawsuits such as the DOJ and FTC actions.
3. Intermittent web scraping and other analysis by academics, SEO and ecommerce consultants, and activists.

For example, from a study of 1.4 billion searches by 28 million UK citizens, we know that in 2011, 94% of Google clicks were organic and only 6% went to ads. But we have no idea what the ratio was in different countries, what that ratio is today, or how it changed in the intervening years as Google updated its algorithms and screen designs. *But Google knows the answer to all of these questions, because they measure these and many other "operating metrics" and use them to manage their business.*

Why We Need Disclosure of Operating Metrics

Google holding company Alphabet has more than 9 products with more than a billion active users and enormous market power, yet it is not required to disclose anything about those products in its financial statements.

The lack of disclosure of operating metrics for the free side of internet aggregators is a gaping hole in the regulatory apparatus. Costs, revenue, profit, and other financial metrics may be sufficient to understand a business based on tangible inputs and outputs, but are not fit to purpose for information businesses whose assets and activities are largely intangible and whose market power is exercised through delivery of services that are free to consumers.

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Some Possible Required Disclosures

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Ads

- **Ad load.** Because not every page has the same number of ads – on Google, for example, many search engine results pages are non-commercial, and carry no ads at all – ad load should be reported by decile, or some other framework that highlights the ad concentration on the most highly monetised pages.
- **Ratio of organic clicks to ad clicks.** Again, by decile or other weighted format.
- **Average click through rate of the first organic result.**
- **Average click through rate of the first ad.**

Other

- **Amount of traffic sent on to third party sites**. This should be bucketed by market segment, such as news, entertainment, commerce, travel, local search, and so on.
- **Amount of traffic sent to the company's own other products and services.** This could be further detailed by traffic source. For example, it would be useful to know how many users come to Google search from Chrome on Apple devices vs. Chrome on Android, vs. from other browsers such as Firefox.
- **Gross Merchandise Volume (for ecommerce platforms.)** Without this information, it is impossible to determine the percentage of all fees levied on third party marketplace participants.
- **Gross fee revenue, including advertising, from marketplace participants (for ecommerce platforms and app stores.)**
- **A monetization narrative** that explains the relationship between these various metrics describing the free side of their platform and their monetization on other platform sides.

We need the equivalent of “Generally Accepted Accounting Principles” (GAAP)

Ideally, regulators, working with cooperative industry players, would define reportable metrics based on *those that are actually used by the platforms themselves to manage search, social media, ecommerce, and other algorithmic relevancy and recommendation engines*. These metrics should then be standardised and required. There may be some metrics that can legitimately be considered trade secrets, but there are many that are common to most if not all internet businesses of the same type.

Note also that the operating metrics of big tech players are a moving target, constantly updated as the platforms continue to innovate. So this is also an opportunity to update the standards-setting process by which required reporting metrics are defined, requiring updated and timely reporting of any meaningful change in operating metrics.

Looking to the AI Future

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Looking back at what we know now about present platforms, we can only wish there had been a disclosure regime that would have shown us the state of these systems when their creators were focused on serving their users and other ecosystem partners, and thus told us when and how they began to turn from that path to extract self-serving economic rents. Much like their predecessors, these frontier AI systems are managed by metrics whose details are known only to their creators and disclosed to the outside world only via generalities and sporadic, often self-serving data points. T*he time to establish rules for disclosure of operating metrics for frontier AI systems is now.*

Amazon’s Algorithmic Attention Rents

Ilan Strauss

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Goals with this paper

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- **Update** Lina Khan's *Amazon's Antitrust Paradox* for profits and platforms.

- Thinking about output, harms, dominance, and exploitation in a **non-price context**, with organic results/output as a starting point.

- Need to theorize the impact of **advertising as *information*** in a digital and multi-sided context.

- How does the **context of advertising** in a multi-sided, *attention market* change its impact?

What makes Amazon, as an online market, unique?

The informational environment which only ‘it’ can navigate.

Jeff Bezos video:

- The informational environment: Infinite selection or its illusion?
- Attention is the scarce commodity
- Data trail

What explains the following decision-making behavior?

> “*Customers complete 28% of Amazon purchases in three minutes or less. Half of all purchases finish in less than 15 minutes.*”

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Key Broad Arguments

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- Excessive levels of advertising by a dominant platform such as Amazon can be exploitative, harming both users who are shown inferior products and producers who can no longer compete on the merits.

- Present antitrust law, emphasizing low search costs and optimizing behaviour, disregards the potential harms from a platform showing users more advertising since “competition is just one click away”.

- Users “satisfice” online by relying on heuristics in decision making under information abundance and complexity

- Algorithmic reliance makes users prone to click on prominently displayed but inferior quality information, including advertising

- Unearned “attention rents” can occur when a platform exploits users' positional-driven click behaviour.

The Chicago School: "Competition is just a click away"

Centrality of **perfect information** and **perfect rationality** assumptions to the Chicago's School's arguments that *markets do not require regulation*.

How to maintain *this argument* in the face of imperfect information, i.e. advertising?

- **More information!** A rational user with fixed and ordered preferences, but facing a shortage of information, always benefits from more information.
- **Optimize!** More information is better since it is easily processed by the user; users are unreliant on institutional forms for processing information and allocating attention; user behaviour is not sticky.

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The Chicago School: “Competition is just a click away”

“Reduced information costs [online] also make it easier for businesses to provide and customers to seek out alternatives [...] Searching and switching are both easier and broader in online markets than on conventional markets. Customers can travel from one site to another with a mouse click. As a result, depending on a consumer’s location, the variety of sellers that are available online can be much greater than the variety that the brick-and-mortar world realistically permits. **Price and product comparison can often be accomplished at little cost and almost instantly**. [...] **Monopoly is not realistically possible if buyers can costly** [sic] **and quickly substitute to a different product**. Switching costs are specific to the product [...] the fact that someone purchased dish detergent last month from a large online seller very likely has little or no bearing on where he will purchase it today.”

- Herbert Hovenkamp, 2023. *Competition Gatekeeper Policy*.

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The Chicago School: Information and institutions

Neoclassical: "*Competition is just a click away*" - the optimizing, rational, calculator.

- **Constraints**. No cognitive or time costs.
- **Advertising & Search**. *Imperfect* information + rationality → Advertising informs and reduces search costs.
- **Institutions** minimize transaction costs.

Writing in a pre-algorithmic era (Nelson, 1974): "He would like to be able to rank stomach remedies by their utility to him. Advertising provides no direct information that will help him do that job."

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An Institutional Approach

New Brandeis emphasizes **economic structuralism,** but what about ***economic institutionalism***?

Organizational forms and technology evolve to shape *information processing* and the “decision premise” (rather than the “transaction” as in New Institutional Economics).

Consumer decision making is not atomistic, consumer preferences are not given, and institutions are needed – not just to contract, but to help users *process information*.

"with costly search, competition may take the form of attempting to find better ways of exploiting the small but finite degree of monopoly power associated with costly search and information" - Salop & Stiglitz (1982)

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An Institutional Approach

Institutional: Navigate information abundance & complexity.

- **Institutions** are collective entities which underpin stable, valued, and recurring patterns of human behavior.
- **Search**. Missing information and boundedly rational → high search costs
- **Constraints** explain how we integrate technology into decision making.
- **Frictionless** decision-making environment, built for speed (system 1 thinking).
- **Markets**? Non-market mechanisms underpin coordination, allocation, and production.

"by broadening the reach of economic analysis beyond traditional markets, it is able to capture a more complete set of the mechanisms by which resources are moved from one place to another." - *Hovenkamp, 2011. Origin of Law & Economics*

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Advertising in the digital context

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- It is a frictionless decision making environment.
- It is informationally complex and dynamic.
- Advertising can lead to immediate action.
- All results compete for a fixed quantum of user attention, since screen space is finite. As a result a trade-off exists between organic results and advertising, especially when shown above the fold.
- There is a strong “positional bias” to users’ click behaviour on a platform.

Amazon Case study: What shapes relative prominence?

Today the conflict of interest that today arguably best defines Amazon is its $31 billion advertising business – getting paid by its third-party merchants to promote *their* products, even as it promises its customers the *most relevant* products.

Advertising shapes the relative prominence of results on Amazon more than anything else today. Policymakers, however, remain focused on Amazon “receiving business from its rivals, even as it competes with them” (Khan, 2017) through its own brand products.

This focus seems misguided, since this is a much smaller business segment for Amazon, with less systemic impact on relative rankings than advertising.

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Amazon Case study: Time and information

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“Today, online commerce saves customers money and **precious time**. Tomorrow, through [algorithmic] personalization, online commerce will accelerate the very process of discovery”. - *1997 Shareholder Letter*

"We offer low prices, vast selection, and fast delivery, but imagine we ignore all of that for the purpose of this estimate and value only one thing: we save customers time. [...] Compare that to the typical shopping trip to a physical store – driving, parking, searching store aisles, waiting in the checkout line, finding your car, and driving home. Research suggests the typical physical store trip takes about an hour. If you assume that a typical Amazon purchase takes 15 minutes and that it saves you a couple of trips to a physical store a week, that’s more than 75 hours a year saved. That’s important. We’re all busy in the early 21st century." - *2021 shareholder letter*

56% of US adults started their product search on Amazon in Q1 2023 (down from 63% in Q1 2022). Far higher than Amazon's share of total U.S. e-commerce sales in 2022 at 40%. 75% of consumers check prices and product reviews on Amazon before making a purchase anywhere.

Amazon: Making money from merchants

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In 2015 the value of goods sold through Amazon's third-party marketplace surpassed sales from Amazon's first-party retail side.

Since 2017, the informational dynamism of Amazon's marketplace increases several fold.

- Between Q1 2017 and Q1 2021, third-parties' share of Amazon unit sales grew by around 15%.
- The number of third-party sellers grew by more than 100%, from ~3 million to ~ 6 million (not all active).
- "Amazon is adding seven to eight hundred thousand [700,000 - 800,000] new sellers every year when accounted [sic] for duplicate seller accounts. That number hasn't accelerated, but then Amazon is still adding over two thousand new sellers daily." (MarketPlace Pulse, 2021).

Amazon: Making money from merchants

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Brad Stone: “Third-party sellers — including the flood of merchants coming online from China — were eager to boost the visibility of their products on the increasingly crowded pages of search results. The solution was obvious: charge them for it, just as Google taxed web publishers to promote their websites in its search engine.”

2016: should ads be allowed on the top half (“above the fold”) of the search results page, mixed in with organic results?

And “while he [Bezos] cautioned against alienating customers by serving too many ads, he opted to vigorously move forward, saying that any deleterious long-term consequences would have to be implausibly large to outweigh the potential windfall and the investment opportunities that could result from it.”

Amazon Case study

"the ability of a platform to increase its price without changing the terms or incurring increased costs on the other side is an indicator of power." - *Hovenkamp, 2021. Looming Crisis in Antitrust Economics*

Third-party margins: 65% of Amazon sellers having profit margins over 10%, but margins are declining, driven by higher Fulfilment by Amazon (FBA) and advertising costs.

Higher ad prices and less return from ad spend = rent transfer from third-party firms to Amazon.

- Average cost per click on Amazon ads shows a doubling from $0.56 in 2018 to $1.2 in 2021. Average cost of spend (ACOS) was 30% according to Adbadger, meaning that $30 cents now has to be spent on ads to drive $1 of sales.

Rising ad costs is listed as a major concern for 59% of Amazon sellers, with only 32% planning to spend more on advertising in 2023. Moreover, 67% of sellers are concerned about Amazon changing search results to favour paid results over organic results. Managing advertising budget is now reported as the third greatest challenge for Sellers on Amazon, virtually on par with finding a product to sell, and behind “getting customer reviews’.

Dominance through attention allocations

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Dominance in attention markets*:*

> *When a platform can profitably undertake attention allocations that are independent of competitor information relevance, consumer interests, or users' explicit search inputs, then a platform's market power may require regulation*.

- Double-sided power (in attention markets).
- Google Shopping vs. European Commission

Amazon Marketplace: for a platform with market power over its suppliers, its algorithmic attention allocations can drive value allocations. (FTC Amazon Complaint).

Information and Competition: Lessons from Apple vs. Epic Games

- The *anti-competitive* harms from suppressing information were raised by the Judge in Apple vs. Epic Games. But they arguably apply equally to Amazon's third-party marketplace.

- Citing Areeda and Hovenkamp, the judge in the case noted that "The less information a consumer has about relative price and quality, the easier it is for market participants to charge supracompetitive prices or provide inferior quality."

- Apple was criticized for its "anti-steering" provisions, denying its users information on alternative (out-of-app) methods to pay.

- The judge also found that "The lack of competition has resulted in decrease [sic] information which also results in decreased innovation relative to the profits being made."

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Taking the competitive temperature from information

In general: "output consists of everything in the product package, including the information that a competitive market would ordinarily provide and that is necessary for a consumer to determine willingness to pay."

- “Platforms” are really aggregators and curators of information.
- **The level of *information* and the level of *competition* are increasingly tied together**, as higher levels of user monetization require a deterioration in the relevancy of information.
- This may entail showing users a level of information *relevance* below that which would prevail under more competitive conditions.

In the case of Amazon, more advertising can reduce the level of information provided to the user, *relative to the competitive level that might otherwise prevail*:

- Traditionally, the courts have seen advertising as increasing the information made available to the user. But practically, the increase in ads may “serve to increase the difficulty of discovering the lowest cost seller . . . and [reduce] the incentive to price competitively[.]” Id. at 377.
- Some restrictions on advertising may, therefore, be pro-competitive and increase fairness through improving the competitive level of information provision.

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Consumer Recommendations

"[...] competition may not help when there are at least some consumers who do not search properly or have difficulties judging quality and prices …. In the presence of such consumers it is no longer clear that firms necessarily have an incentive to compete by offering better deals."

– *OFC, 2012.*

More competition might create more information rather than the right sort of information. The same OFC Report notes that "when consumers have cognitive limitations it is not only available information that may matter but also its presentation".

In Apple vs. Epic Games, it was consumer law that was used to find that Apple had unfairly competed through anti-steering provisions, based on California's *Unfair Competition Law* (UCL), to "hide critical information from consumers and illegally stifle consumer choice."

Citing the precedent that requires "consumers ha[ve] a free and informed choice", since "Without information, consumers cannot have a full understanding of costs."

Consumer Recommendations

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"In the context of technology markets, the open flow of information becomes even more critical. As explained above, information costs may create "lock-in" for platforms as users lack information about the lifetime costs of an ecosystem. Users may also lack the ability to attribute costs to the platform versus the developer, which further prevents them from making informed choices. In these circumstances, the ability of developers to provide cross-platform information is crucial. While Epic Games did not meet its burden to show actual lock-in on this record, the Supreme Court has recognized that such information costs may create the potential for anticompetitive exploitation of consumers."

– *Eastman Kodak, 504 U.S. at 473–75.*

Behind the Clicks: Can Amazon allocate user attention as it pleases?

Rufus Rock

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Motivation - How to measure a platform's market power?

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Background

- A dominant platform like Amazon may try to compel its locked in suppliers to pay for advertising in order to extract pecuniary rents from them.
- *Ecosystem exploitation* occurs when Amazon is able to compel its suppliers to pay for visibility in order to compete for user attention; rather than encouraging competition based on product merit ("organic").
- Excessive advertising can lead to inferior product matching or higher search costs for *users*.
- **Amazon's ability to exploit its ecosystem of firms *is limited by* its ability to ensure more user attention / clicks goes to this paid advertising results**.

Aim: Estimate Amazon's direct (market) power over users, to allocate user attention to inferior quality search results.

Approach

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Combine Search Results Data + Most Clicked Product Data

- Scrape 154,172 product in search results from 2,250 search queries on Amazon's third-party marketplace.
- Combine above product information with data on which products users click on the most ("top-3 most clicked").

Methodology: *Estimate Amazon's market power to allocate user clicks as it degrades results quality*

- Estimate probability of user click (demand) on a product by logistic regression - are clicks driven by relevancy (organic rank) or by position (attention share)?
- If clicks driven by product position, then how much can Amazon exploit this to deteriorate & monetize results quality?

Predicting Clicks

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How to **measure impact of a product's *relative product prominence*** - size, position, or number of scrolls? Combine them!

- **Attention share** - novel metric to capture relative visual prominence, accounting for screen position, page layout, and ease of cognition (working memory). Informed by decision sciences.

What is **best indicator of relevancy** on Amazon?

- **Organic rank** is Amazon's estimation of a products *overall* relevancy. Organic rank for any given search is shown by the ordering of Amazon's non-advertising results.

Example: A product might have an organic rank of 1 but appear as result number 19, because of advertising and banners etc.

Advertising reduces variety and increases duplication

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Table 2. Key Descriptive Findings from the Sample

Top-3 most clicked Products	
% of Products that are Top-3 most clicked	6.4%
% of Top-3 most clicked Products that are Ads*	31.8%
Amazon's Choice	
% of Products that are "Amazon's Choice"	1.6%
% of "Amazon's Choice" Products that are Top-3 most clicked Products	73.4%
Advertising	
% of Products that are Ads*	33.8%
% of Ads that are Duplicated*	40.4%
% of Top-3 most clicked Ads that are Duplicated*	95.3%

Note: (*) Denotes statistics which are (out of necessity) taken from our sample before filtering for products with complete information.

Ads on Amazon try to exploit users (concentrated) *position-driven* click behaviour…*But can they*?

Figure 1. User Clicks are Highly Concentrated at the Top of the Page

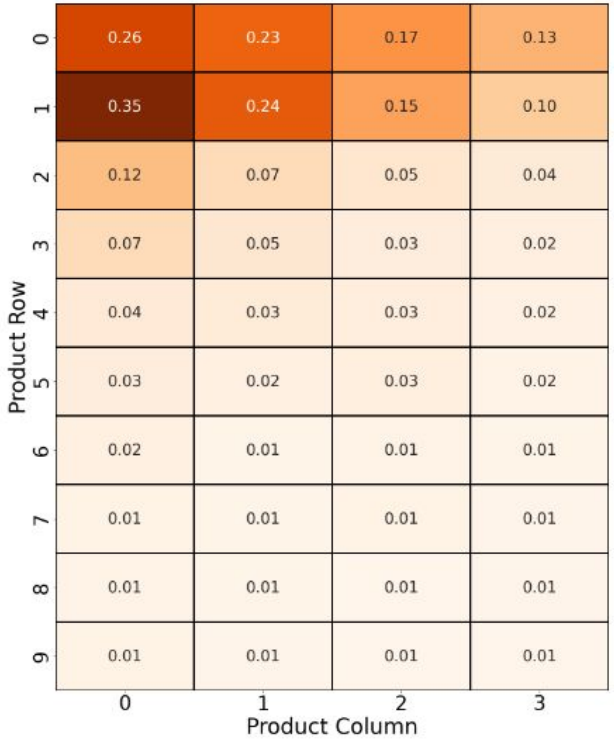
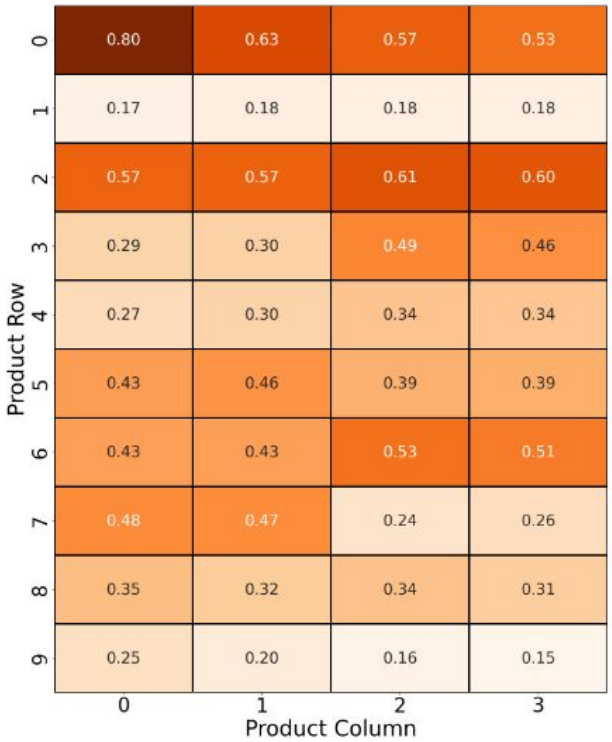


Figure 2. The First Search Result has an 80% Chance of being an Ad



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Key Findings from Econometric Analysis

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- A product's *relevancy* and its *relative prominence* ("attention share") both drive user click behaviour. Can they be traded off? Which one will win out?

- Users are more likely to overlook negative product characteristics (low relevance, high price) in the most visually prominent products.

- This behavioural bias gives Amazon the ability to allocate user attention/clicks to advertising products that are less relevant to the users search (by Amazon's own estimation).

- Ads increase the complexity of the decision making environment, and allow Amazon to exploit user's position-driven click behaviour.

Institute for Innovation and Public Purpose

THANK YOU!

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For further information contact: j.strauss@ucl.ac.uk

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