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Is Google the Next Microsoft?

Competition, Welfare and Regulation in

Internet Search

Rufus Pollock

University of Cambridge

21st April 2009

Internet Search Engines

Figure: Unknown in 1998, today a household name

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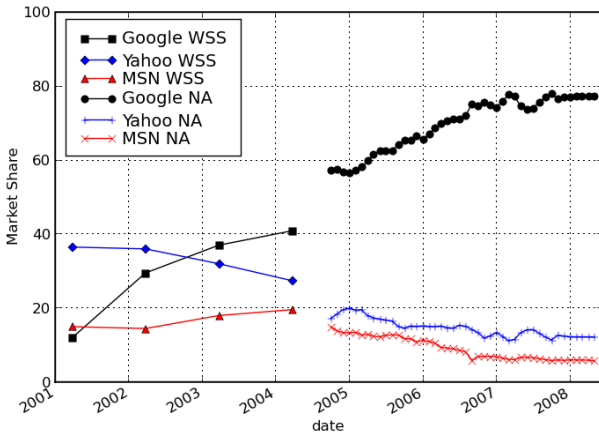   ○○○○○○

Some History

- First search engines 1993-1996 (Net: 1980, Web: 1991)

- Yahoo!: 1994, Altavista: 1995, Google: 1998 (1996)

- Discovery of potential of targeted ads 2000

    - Suddenly search was more than just a portal

- Grown massively over the last decade

    - Today G's revenues > $10 Billion pa

    - Most visited website on the planet

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Search Market Increasingly Concentrated

Company	United Kingdom	United States	Australia	Hong Kong
Google	81.1	59.1	84.0	36.2
Yahoo!	3.9	19.3	3.2	33.1
Microsoft	4.1	7.7	5.8	3.2
Ask.com	2.7	2.8	0.0	0.0
Sogou	0.0	0.0	0.0	5.6
Baidu	0.0	0.0	0.0	2.7

Table: Percentage market share in Sept 2007 (As of Apr 2009:

Google now 91% in UK, 73% in US, 91% in Australia)

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Grown More So Over Time

Important Questions to Answer

- Why so concentrated?

- Will it evolve (further) towards monopoly?

- Implications of concentration for

  - Consumers

  - Search engines

  - Advertisers

- In particular would monopoly be good/bad?

  - How?

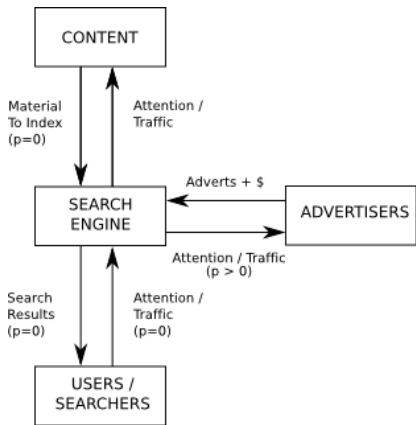- If bad what could regulators do?

Relation to the Literature

- Growing number of papers on auctions and advertising (Varian 2007, Edelman et al 2007)

- 'Antitrust' and Search Engines: very limited

- Existing theory of course relevant

- Models of quality differentiation (Shaked and Sutton etc)

- Multi-sided markets/platforms (Armstrong 2006 etc) – fairly limited

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Investigations

Salient Points

- Technology: Software + Service

    - Algorithms + Data Centres

    - Large fixed cost, low MC business (both parts)

- Power: Search engines are information gatekeepers

    - Determine importance and control what we find

    - 'If you post but aren't indexed did you ever post?'

    - Affect behaviour of most other parts of the ecosystem

- Pricing and business model

    - Do not charge users ...

    - But sell users attention to advertisers

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Agents and Innovations

- Users/Queries (U), Advertisers (A), Search Engines (S), [Content Providers]

- SE have quality v (quality of organic results)

- U heterogenous but all value quality +vely

- SE do not charge users

- So no. of users a a function of quality alone

- SE (ad) rev: R function of no. users and quality

- Search engine costs: fixed only

- Profits: $\Pi = R(q(v), v) - c(v)$

- Effect of quality on revenue by 2 avenues

- R_v: direct effect – rev for fixed set of queries

- $R_q v'$: increase in no. of queries

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Market Structure

Market Structure

- 'Bertrand' style competition in quality

    - Users all value quality +vely

    - And no prices for users (o/w Shaked-Sutton-like)

- Exact outcome would depend on structure of moves etc

- Two issues: dominance and contestability

    - In general convergence towards dominance likely

    - Fits current data

    - But: might still be contestable (Stackelberg model!)

    - 100% not a problem if because they're just the best

Market Structure II: Contestability

- Determinants of contestability

  - Size and sunkness of fixed costs - Harris/Vickers

  - 'Lock-in' due to e.g. switching costs

- Fixed costs large and growing esp. for 'service' side

  - And most are sunk (e.g. R&D)

- 'Lock-in'

  - Brand effects

  - First-mover advantages (variation in market shares)

  - Learning 'lock-in' – e.g. query refinement

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Welfare

Social Welfare

- SW = user utility from search (U) - cost of search

  - Both with monopolist and w/ central planner

  - Advertising and SE profits net out (see paper ...)

- Optimal social quality v^W: $U'(v^W) = U_v + U_q q' = c'$

- Monopolist chosen level: $R'(v^M) = R_v + R_q q' = c' + c'_A$

- Ignore costs of ads (c_A) + focus on U(til) versus R(ev)

- LHS declining in quality so ...

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Functions to Welfare Outcomes

If marginal utility (U') > marginal revenue (R')

$\Rightarrow$ then monopolist under-provides quality

(and vice versa)

(Classic effect – here quality in place of output)

Demand Effects

- Normally: social benefit extra query < rev benefit

- Here not so clear

    - Revenue comes via adverts not via charges to users

    - Ad rev for a query could be > than SB from query

    - Just 'because' or due to

    - Complementarities and economies of scale in ads

- That said: a lot of socially beneficial queries give 0 rev

- Hard to say without data but IMO likely that $R_q q' < U_q q'$

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Direct Quality Effects

- Clear that $U_v \geq 0$ – quality increases utility of existing queries

- R_v: argue that < 0
  - 'Substitution' effect: organic search substitutes for ads
  - 'Antagonism' effect: search may give info that deters using ads (e.g. vitamins)

- $\Rightarrow R_v < U_v$

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Putting it Together

Monopolist undersupplies (distorts) quality

1. Because of classic 'social-private' gap

2. Effect of quality on existing user/query base

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Summary of Results

- Analyze search engine market from IO perspective

- Market Structure: monopoly likely

- And unlikely to be/remain contested

- Monopoly and welfare

- Possible for both too much/too little quality but ...

- Monopolist likely to undersupply quality

  - Classic social-private gap

  - Quality for existing users: substitution and antagonism

Policy

- Should already be keeping a close eye on search

- Could directly regulate quality

    - Who do you appeal your page rank to?

- Promote competition

    - Could separate search software and service

    - Public funding (under license)

- Search as general purpose technology

Microsoft <-> Google

- Technology: share key features (e.g. cost structure)

- Profitable: Both highly so

- Anti-competitive incentives: Yes for both

- Dominance: Yes for both

- Contestable: No for MS, ? for Google now (though No likely in future)