



**Virtual Scholars, Google Generation, Smartphones,  
Social Media and Open Access : big challenges**  
David Nicholas



## **Part 1: Virtual scholars and their behaviour**

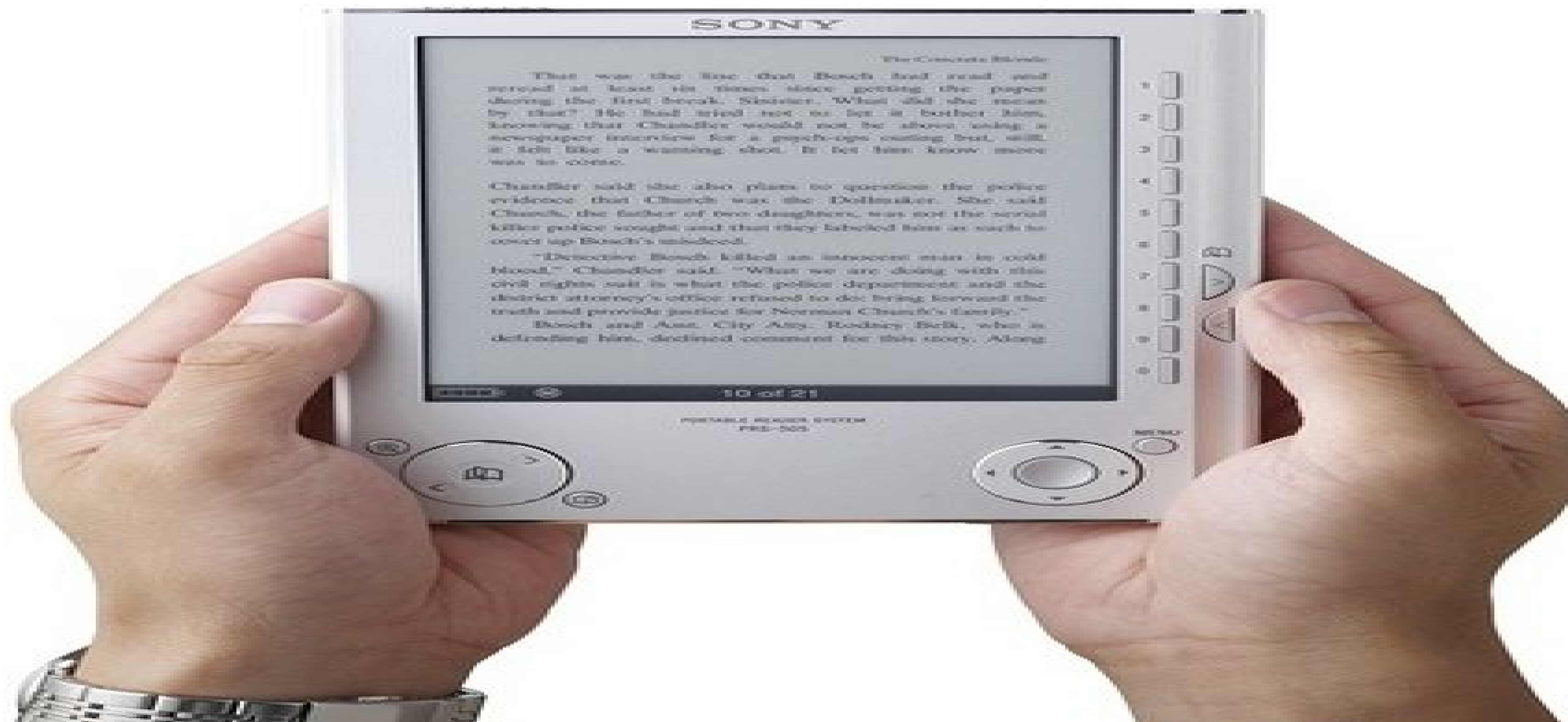
# Background

- Been studying virtual researcher for 10 years and a lot of people thought we were bonkers talking about *bouncing, promiscuity, fast bag pick-up, reading 'lite' and digital consumers*
- These words represent the new information seeking and reading.
- Talk built on huge evidence base; result of studying the usage logs of millions of virtual scholars on many library/publisher platforms. Never known so much about how researchers find, read and use information. Topped up with a questionnaire and qualitative study of trustworthiness in scholarly communications in the digital environment
- Based mainly on what researchers *do* in digital space; not what they *say* they did or *wished* they did. Have problems recalling what they did in digital space (partly because cannot remember and partly because they would rather not tell)

## Results are an eye opener, a wake-up call

- Results show researcher behaviour not to be quite what we might have though/planned for/built systems around
- Digital transition and disintermediation (DIY) main behavioural drivers and we have a few more rounds to come; we live in transitional times. An Internet year is just 7 weeks
- The digital is *rewiring* people's brains so going to have to understand and adapt to it. We are not talking about dis-functional behaviour here! Have to get real
- Talk timely as digital environment being hit by the 'Perfect Storm' – whipped up by smartphones, open access, social media and the Google Generation. Things could get out of hand!

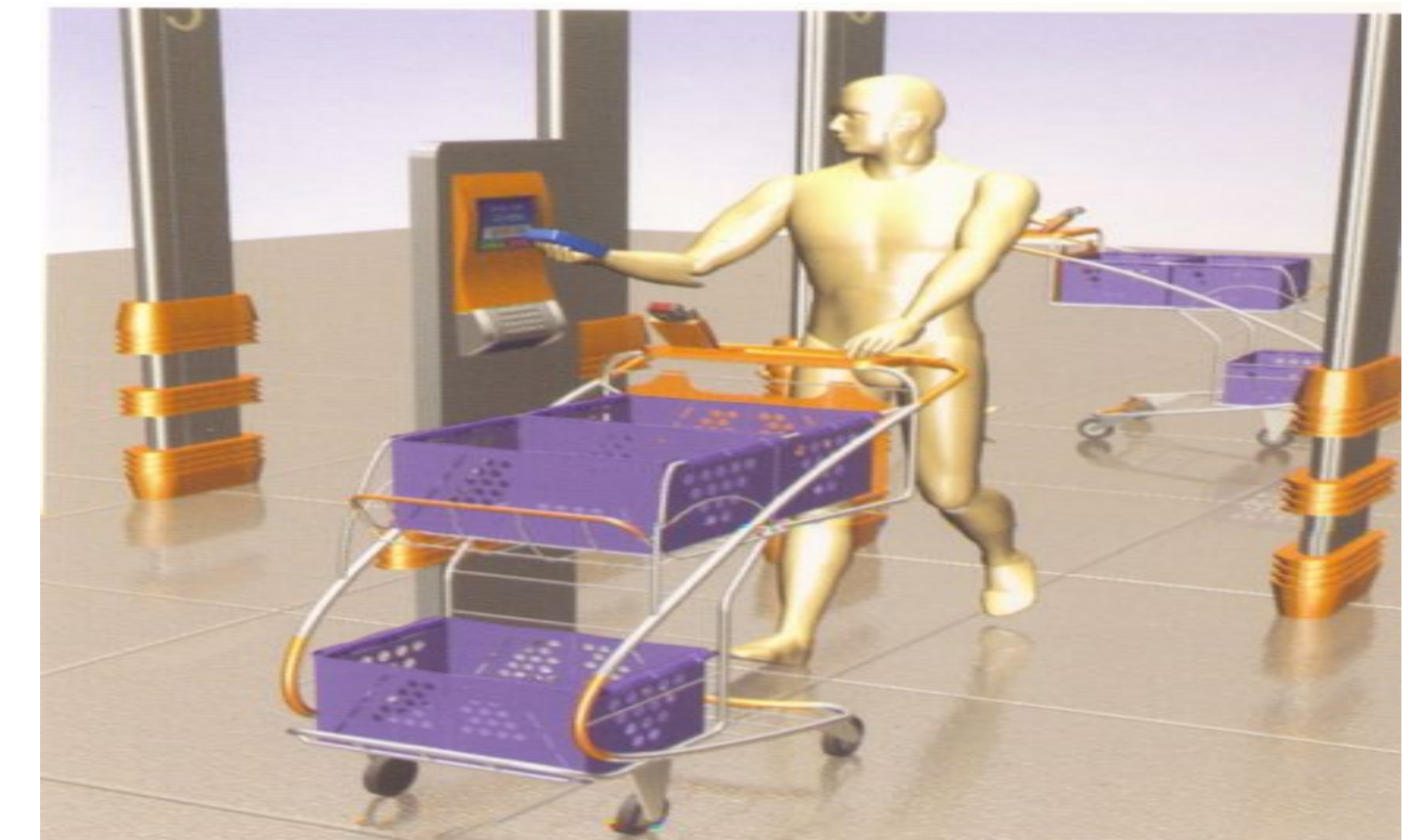
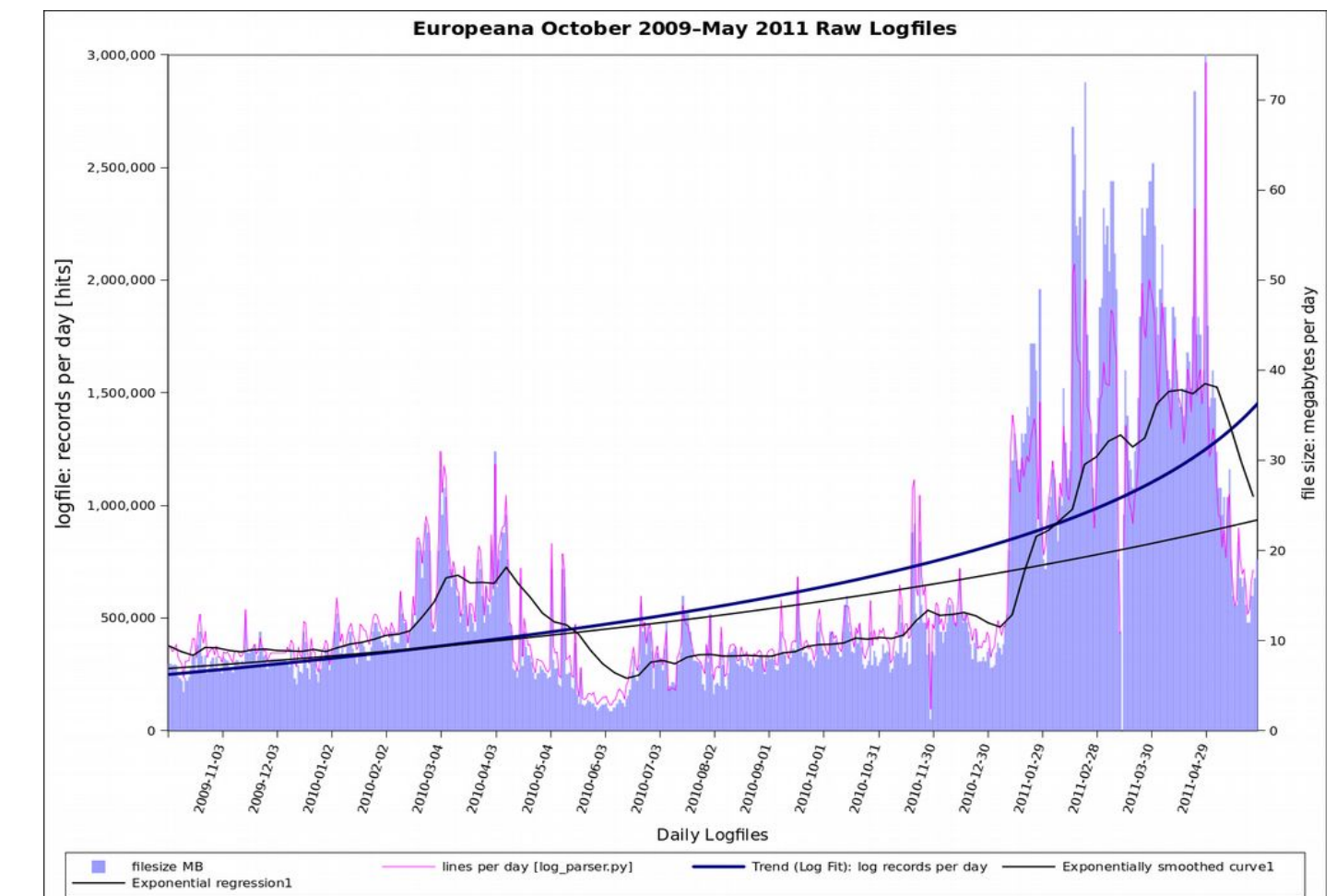
So how do scholars behave in the virtual space?





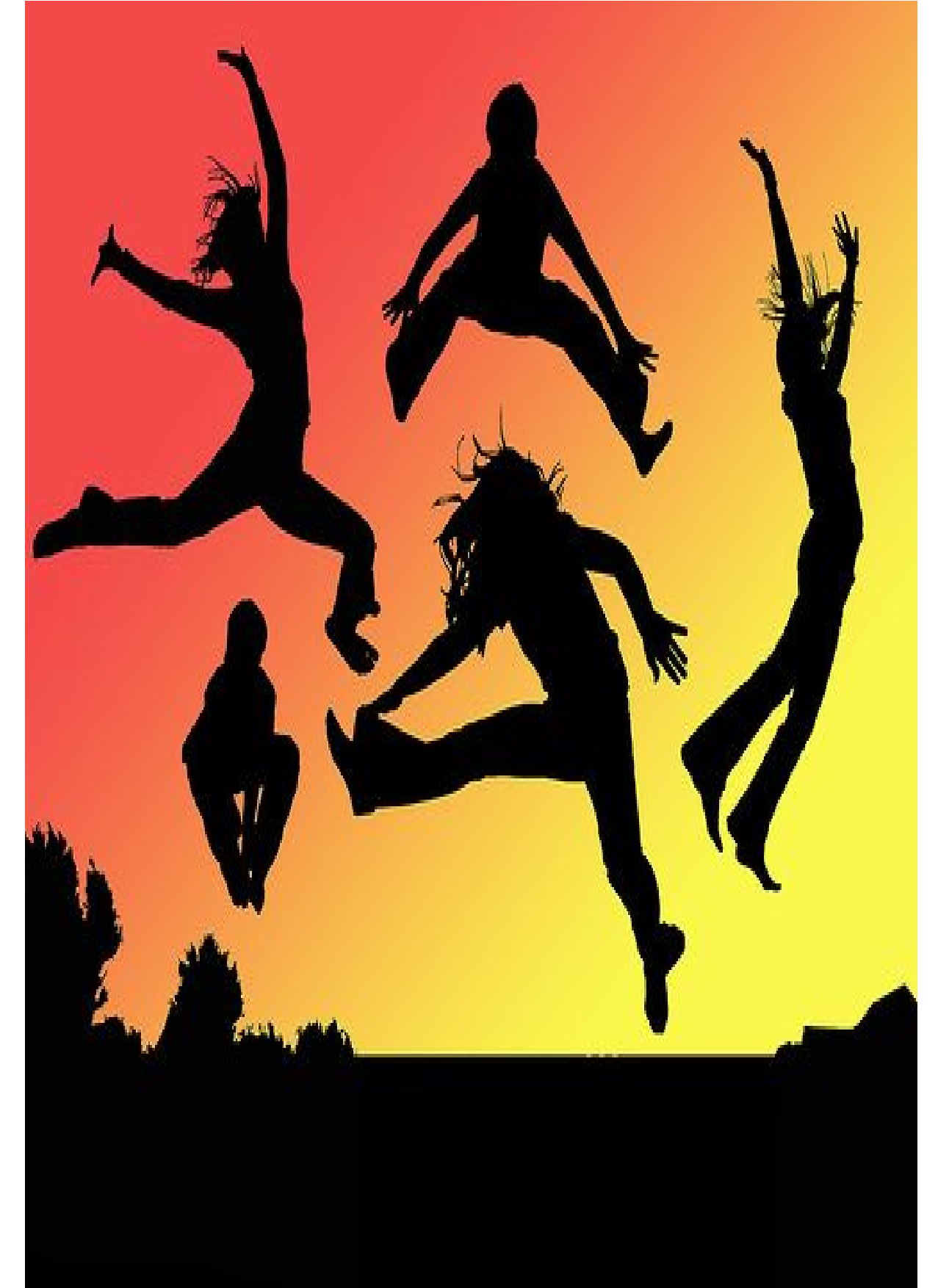
# 1. Very active, but much activity down to robots

- Staggering volumes of activity. It frenetic
- Access and disintermediation the main drivers:
  - a) new users drawn into information net. All connected to big fat information pipe. Put it up there and it **will** be used.
  - b) existing users can search more freely & flexibly – 24/7 anywhere and on the move
- Huge growth also down to:
  - a) more digitization and visibility; b) preference for everything digital; c) India and China; d) wireless/broadband; e) mobile devices – platform of choice for accessing web content in two years
- Lots of ‘noise’ (didn’t mean to use) and robots/crawlers - account for 80-90% of activity. Robots good - the new intermediaries?



## 2. Bounce a lot

- Most people view only 1-2 pages from thousands available; 3 is many
- Around 40% do not come back – they are promiscuous
- ‘One-shots’ abound (one visit, on page)
- Bounce because of:
  - search engine searching (lists) and links (enjoined to go elsewhere)
  - massive and changing choice
  - so much rubbish out there
  - ‘acceptance of failure’ – result of pragmatism, lack of time & overload
  - poor retrieval skills (2.2 words per query and first page up)
  - leave memories in cyberspace, which adds to ‘churn’ rate
  - direct result of end-user checking
  - effective searching strategy





### 3. The horizontal has replaced the vertical

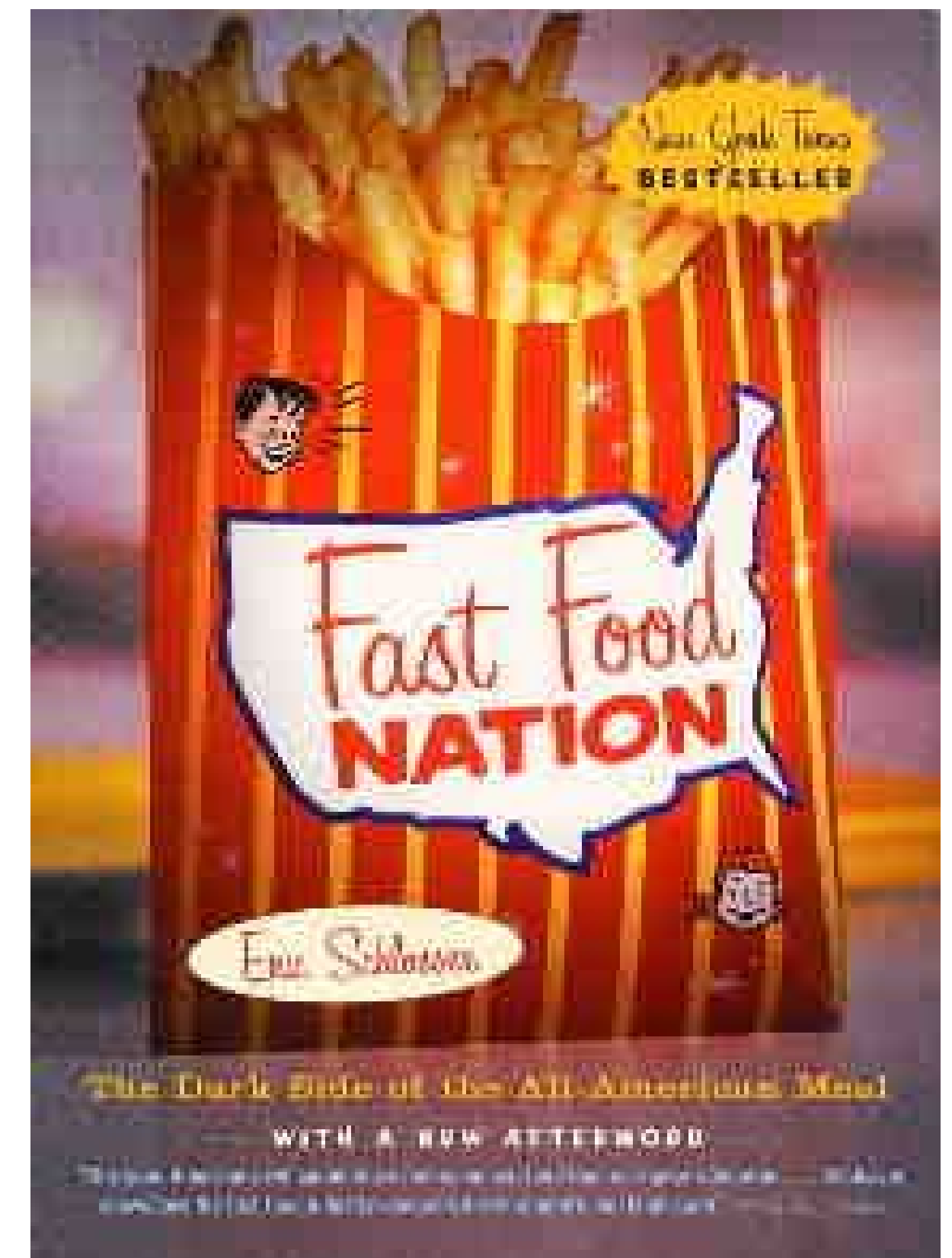
- In information seeking terms we 'skitter' (moving rapidly along a surface, with frequent light contacts or changes of direction)
- 'Power browse', drive-thru titles, headings, links & summaries at a fast rate. Charge for abstracts and give away PDFs!
- Building digital motorways through and between content means movement itself pleasurable...might be something (more) interesting around the corner. Lots of things never connected before – enter serendipity and nostalgia
- Hence popularity of third party sites, like Google Scholar
- And then there is multi-tasking – always more pleasurable to do several things at once rather than one thing
- Don't do 'deep' or long anymore (more on this later)





## a. 4. Fast information

- As in life, the (information) snack/bite has replaced the three course meal (whole book/article)
- Been conditioned by emailing, text messaging, tweeting and PowerPoint to like/produce/want/need fast shots of information
- 'Fast bag pick-up' the gold standard
- Don't come in the front door; courtesy of Google, we deep dive
- Web designers & content providers thought we would dwell and knock on the front door. Do you remember site-stickiness?
- Avoid carefully-crafted discovery systems. Love Google and Scholar; even the very best researchers

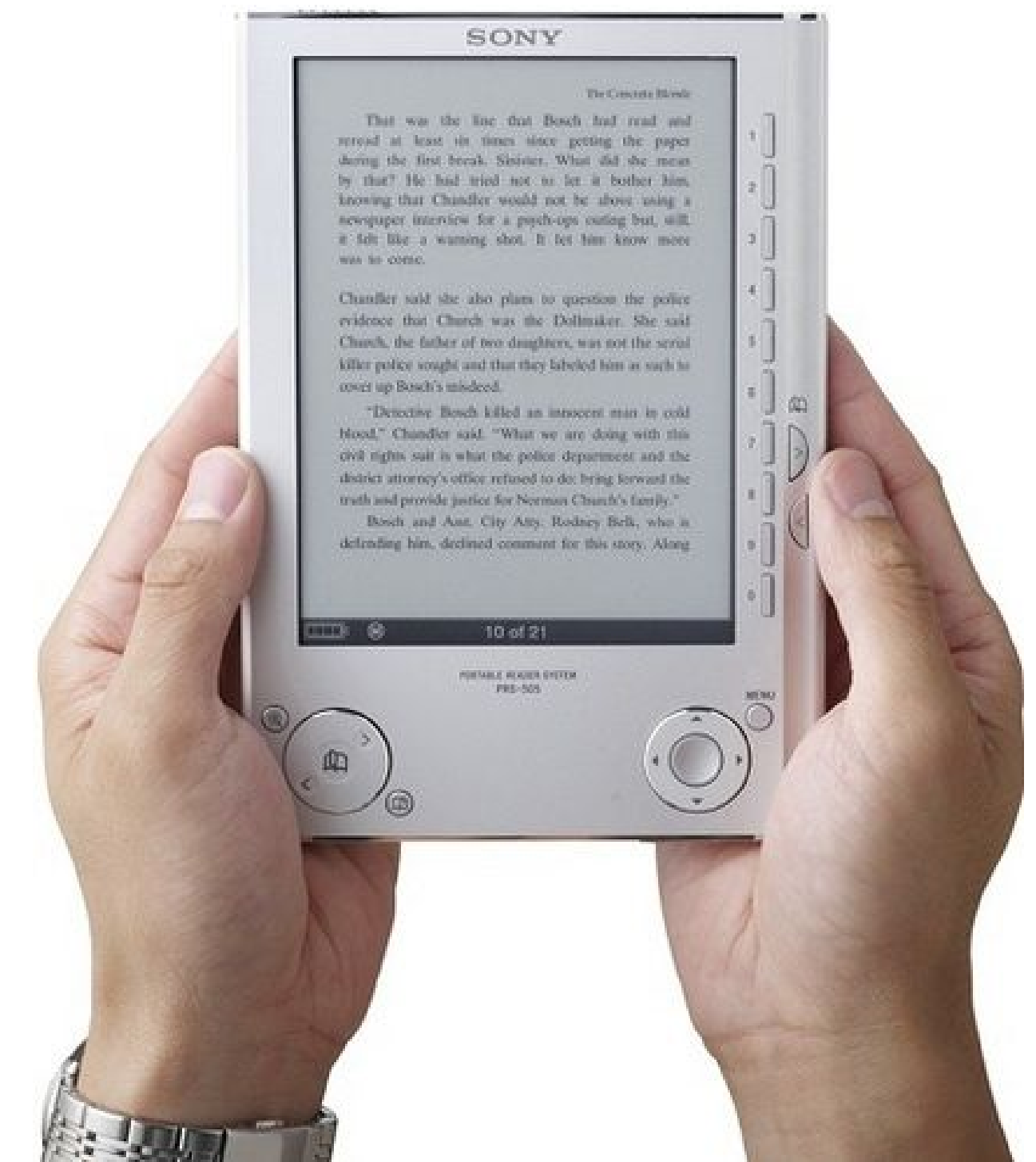


## 5. Viewing has replaced reading

Nobody does much reading or not what is traditionally thought to be reading (reading whole documents). A read can mean 10-15% of a doc

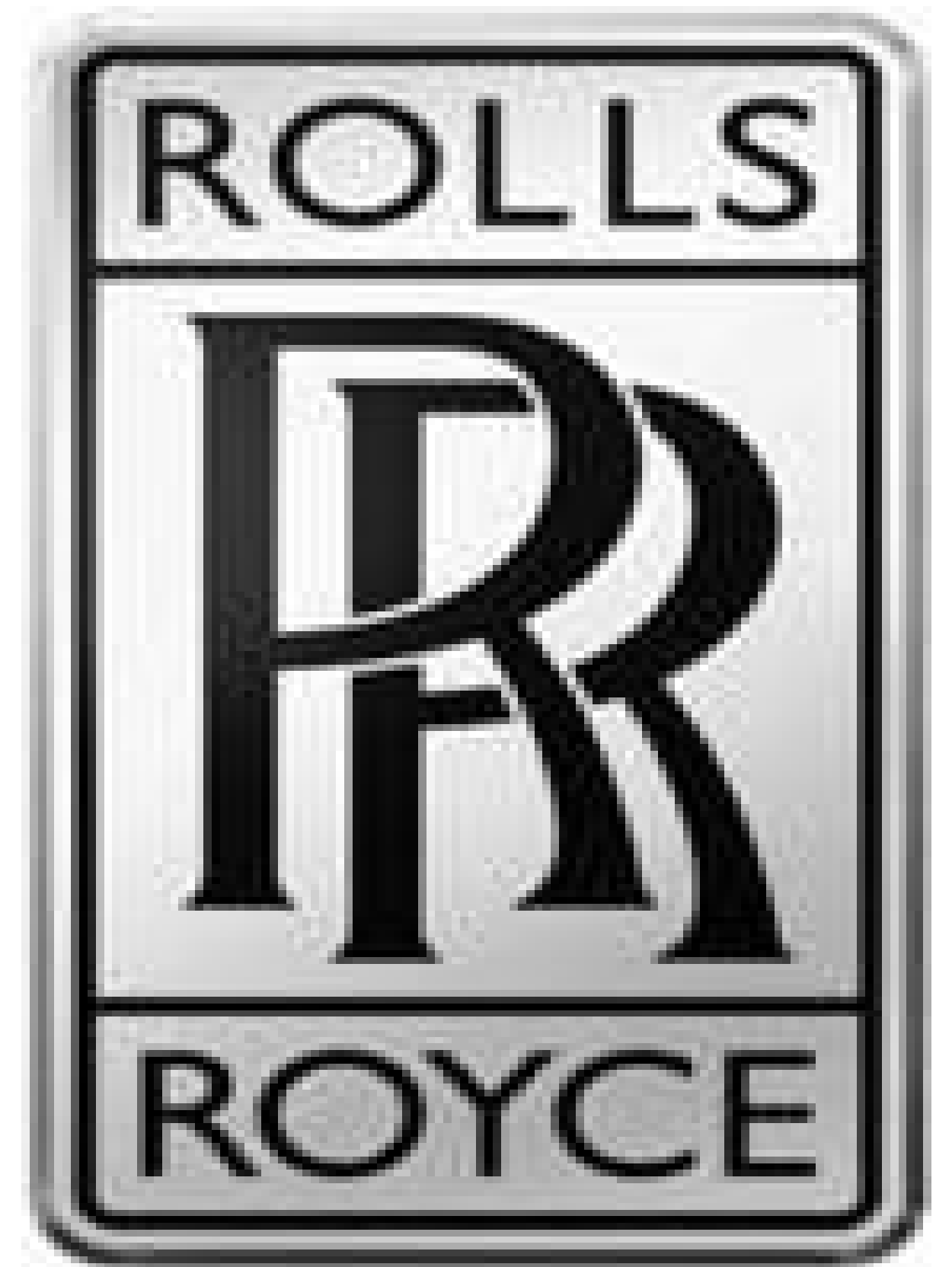
Logs tell us:

- Scholars seem to go online to avoid reading;
- Only a few minutes spent on a visit; 15 minutes is a very long time;
- If it is an article then 3-4 minutes will be spent on it;
- Shorter articles have much bigger chance of being viewed;
- Abstracts have never been so popular 10:1
- If article long, summary will be read or it will be downloaded and squirreled away for another day (when it will not be read!). Something we call 'digital osmosis'
- We spend more time (dwell) on visual pages/sites
- Never wanted it all – batch processed, no choice. Change definition



## 6. Assessing trust and authority difficult

- Huge choice, overload, so much churn, no intermediaries to help, and so many players (some are sharks)! Means responsibility & authority almost impossible to establish in cyberspace. Don't even know whose information it is!
- Hang on to people they know, their research communities, peer review and metrics for dear life
- Historically trust signified by 'established x years'; probably works the opposite way now (Wikipedia 10 years old; Facebook barely 10)
- Google is trusted





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## Part 2: the Google Generation (and Gen Y)



# Game changers: the Google Generation (born digital ,1993-) and young generally

- Worries about what young were up to, carrying that into adulthood, workplace etc.. So how do they behave:
  - Greatest appetite for fast information and skittering
  - Quickest searchers, spend time on a visit – fraction of time spent by adults.
  - But least confident about their answers. Lack of confidence explained by their behaviour – first one up, view fewer pages and domains and do fewer searches. First past the post approach endemic.
  - Queries much closer textually to questions posed, making them, not just fast food generation, but also `cut and paste' generation. As for multitasking, at which they 'excel', they do it a lot, but not very well.
  - Ease of access sometimes trumps trustworthiness
  - Love smartphones
  - Young fast forwarded from a world where the focus was on knowing one big thing well to a world where you know many things, but not very well.
  - Don't do emails (Universities)



## Game changers: and then there is Generation Y (1977 - 1994)

- The new wave that has hit. Compared to older researchers (31+):
- Much bigger reliance on metrics, Impact factors and abstracts. Love quality filters.
- Expend less effort on finding information in conventional information systems
- Much more liberal in citation behaviour
- Much more positive in respect to Open Access publications
- Happy to disseminate on a wide range of platforms, including social media
- Social media has a key role in building communities of interest
- Very pragmatic: take the good with the bad
- *Young researchers used all outlets available in order to get work published and in this respect made most use of new digital services*





## **Part 3: smartphones and information on the go**

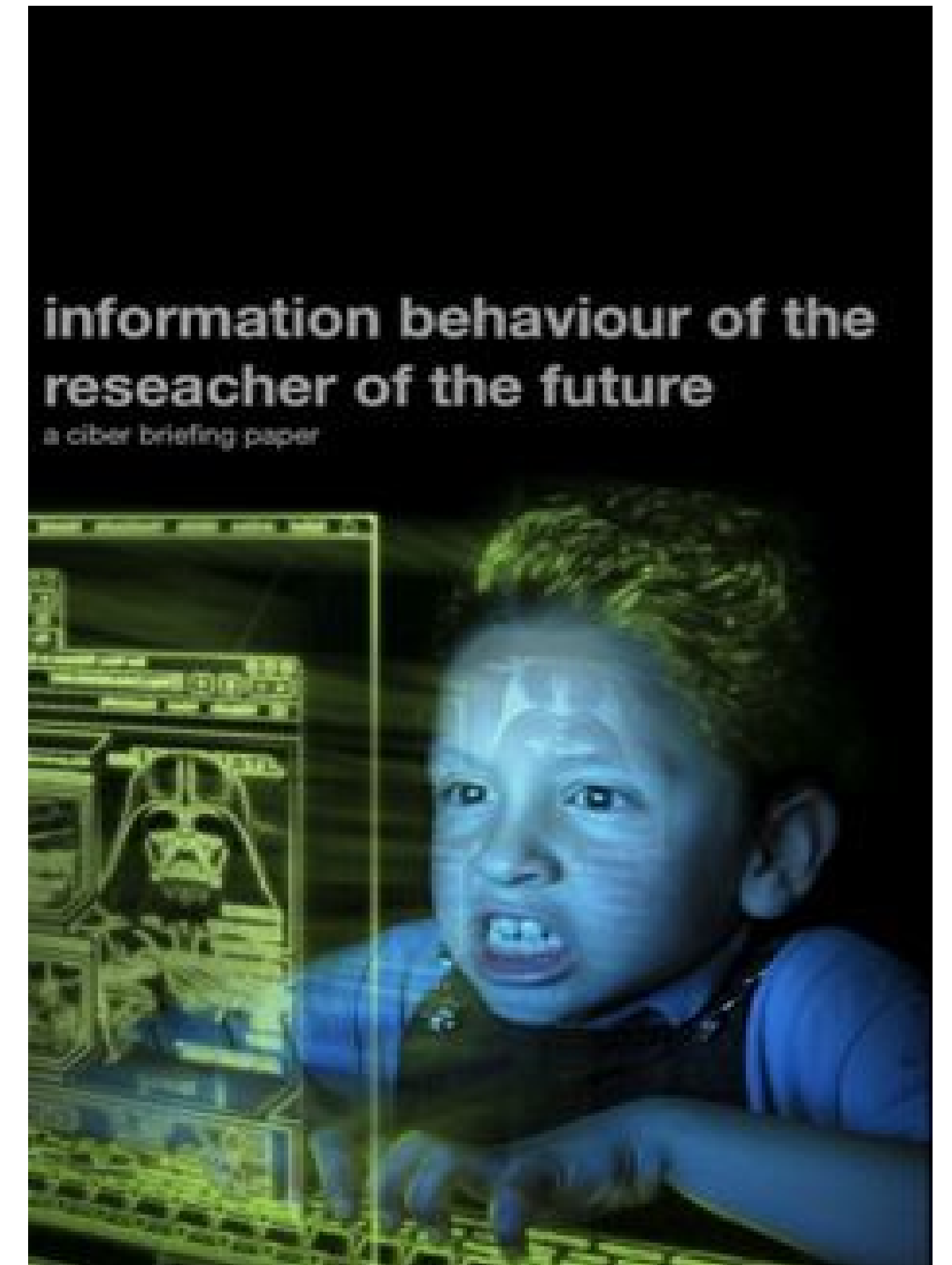
# The tsunami hits: the second digital transition

Not seen anything yet, with information professionals (and teachers) barely taken breath and stock, another revolution is on us, and has a greater weight behind it

Google Generation (and the rest of us) have been empowered by a mobile device (smartphone/tablet) that will take a form of behaviour alleged as 'extreme' to a completely different level. **The end of culture as we know it!**

First transition, from physical to digital, transformed the way we seek, read, trust and consume information, but environment in which we conduct these activities had not really changed – still in the library/office, and on a device primarily designed for the desk/office bound.

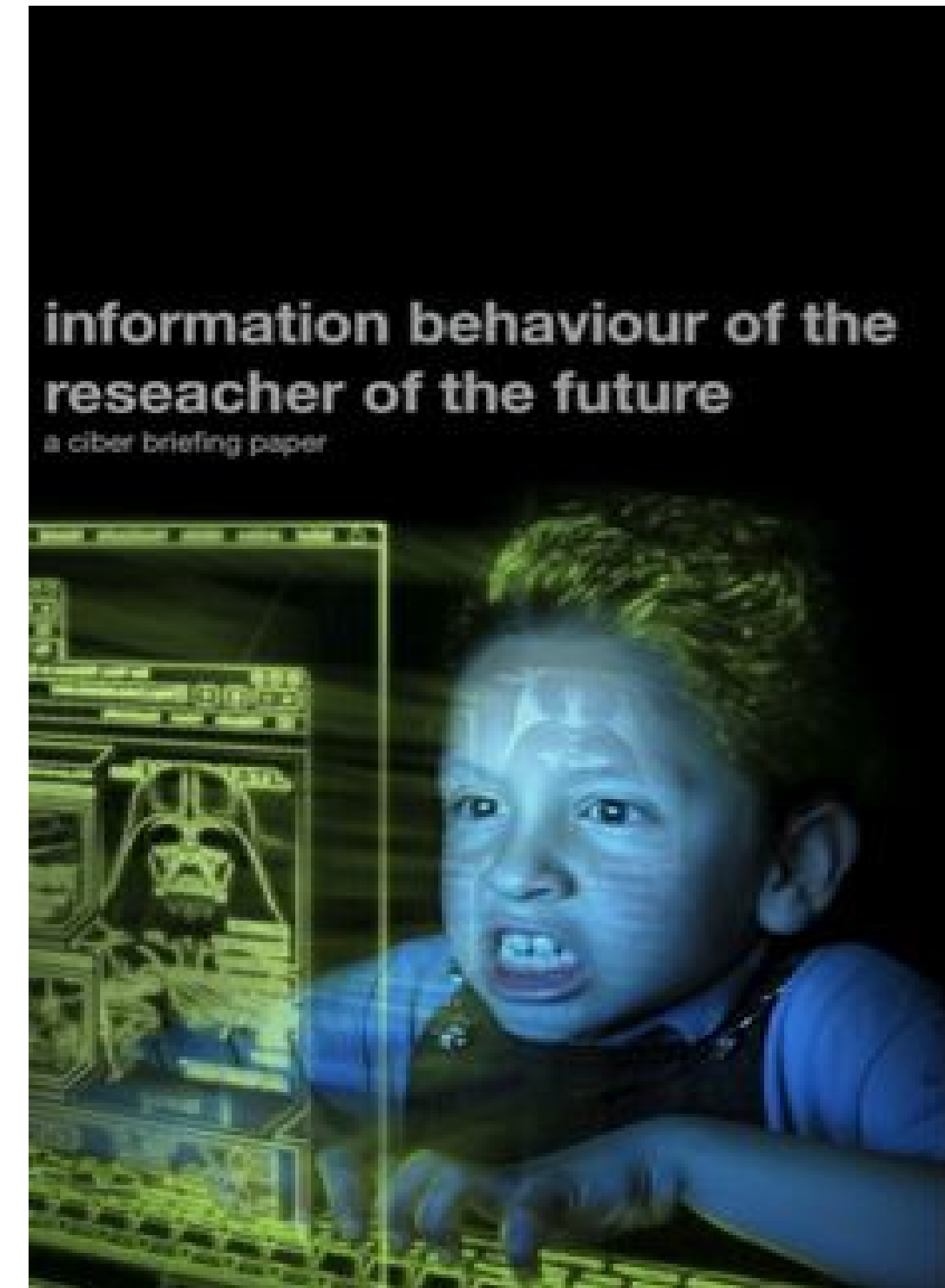
This year mobile becomes the main platform for accessing the web and this means we are untethered





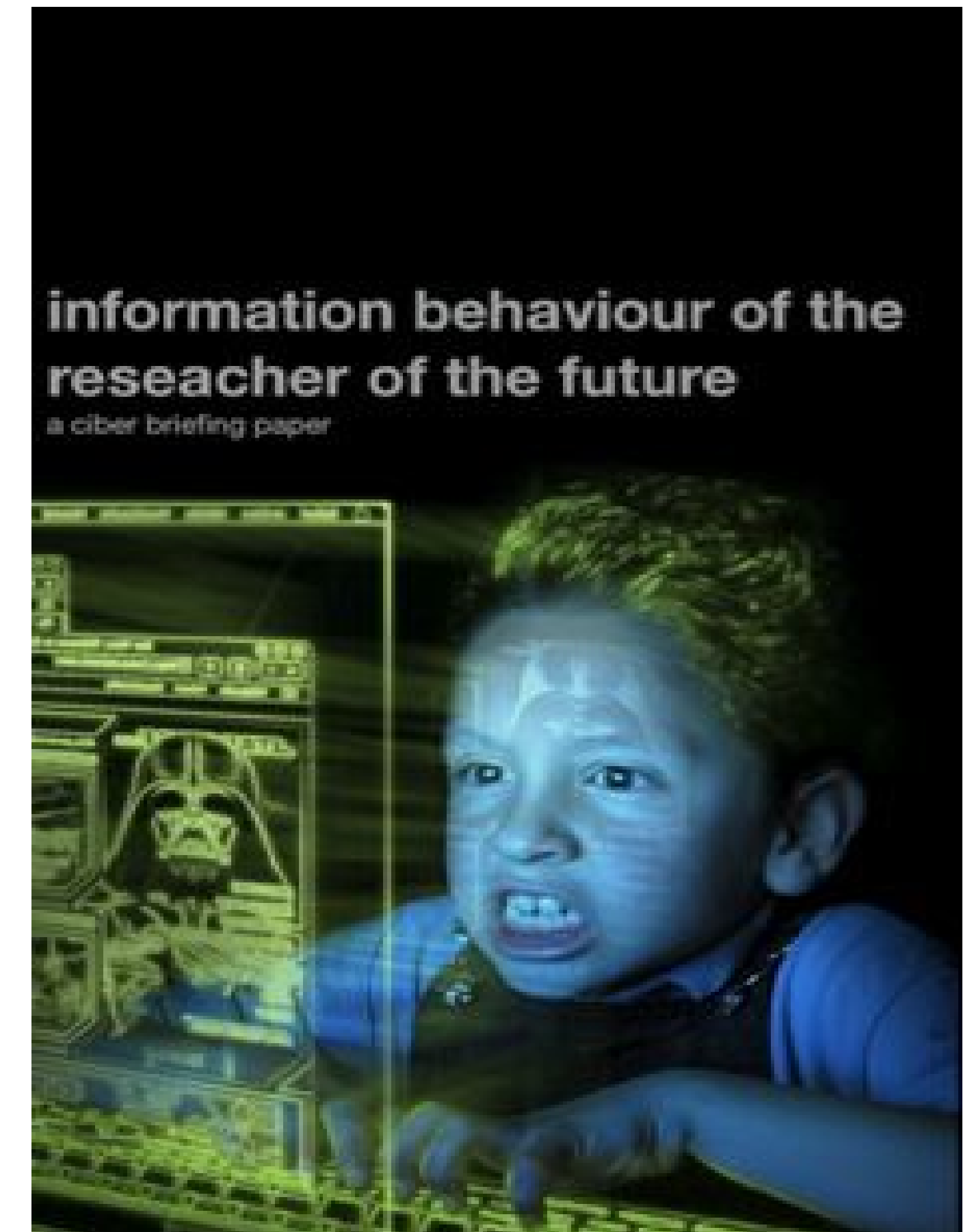
# Key characteristics

1. Mobiles mean can meet information needs at time of need, rather than cold store until reach the office, library or home. Mean more needs are met, but perhaps not always that well.
2. 'Big deals' provide fantastic access to information to a privileged few; mobile provides access to masses of information for everyone and anywhere; and, open access increasing the haul;
3. Smartphones social media devices and stride major information worlds, informal & formal;
4. An intrinsic part of the digital consumer purchasing process – used to search for information prior to purchase, during process itself and to make purchase.
5. Trust mobile more than any other information/communication technology.
6. Smaller screens and different ways of interacting (via touch screens and voice recognition rather than keyboards and mice) and this impacts on use.



# Key characteristics

- Not computational devices but access devices; also social, personal, cool and massively popular. A very heady cocktail!
- And 'apps' are changing behavior yet again
- Mobiles devices have huge potential to:
  - a) draw in a larger and more diverse audience for (scholarly@ information
  - b) [further] change the nature of information seeking behaviour and to do this for billions of people,
- Despite the considerable challenges for all stakeholders in information industry know very little about a) how users behave in the mobile environment; b) how differently this behavior is from that associated with laptops and desktops.



# Europeana mobile use



- Mobile usage growing at **5 times** greater than 'fixed' devices
- A staggering rise of nearly **400%** in six months, admittedly from low base
- **130,000 unique** mobile users accessed Europeana in last 6 months
- Over 90% **Apple Mac devices**; iPads the vast majority
- **Information 'lite.** Visits from mobiles much less interactive: fewer records/pages viewed, fewer searches conducted; less time spent on a visit.'
- **Differences between devices:** limited screen real estate and slowness of Blackberry means use very abbreviated indeed, iPhone quite abbreviated and iPad generates metrics closer to desktops/laptops. Little depth research on show.
- Mobile use peaks at nights and weekends; that from desktops on Wednesdays and late afternoon. Searching and reading has moved into the social space

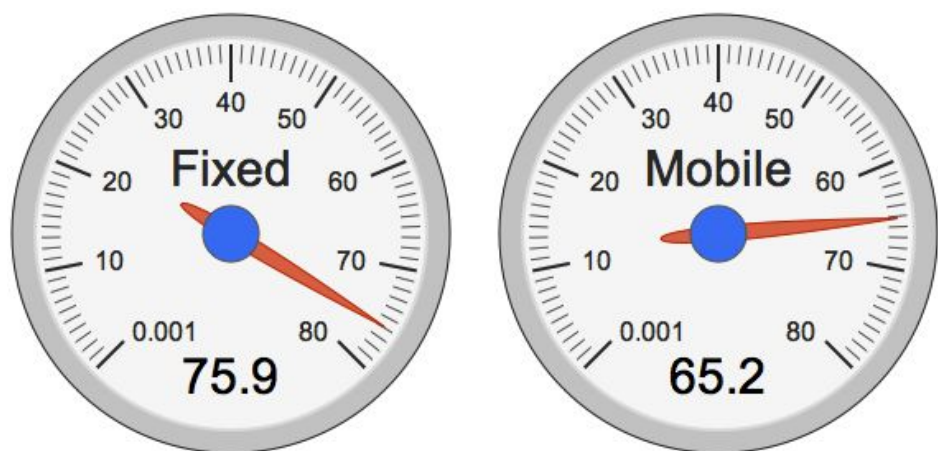




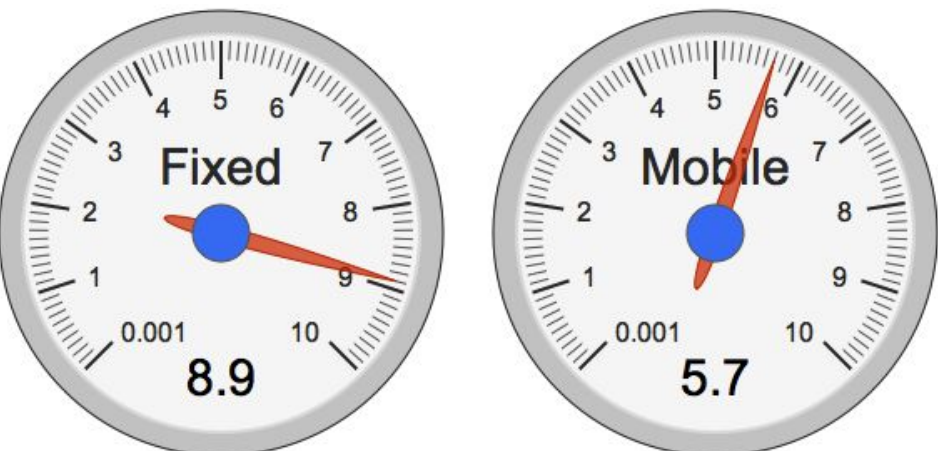
# CIBER dashboard: fixed and mobile user information seeking compared



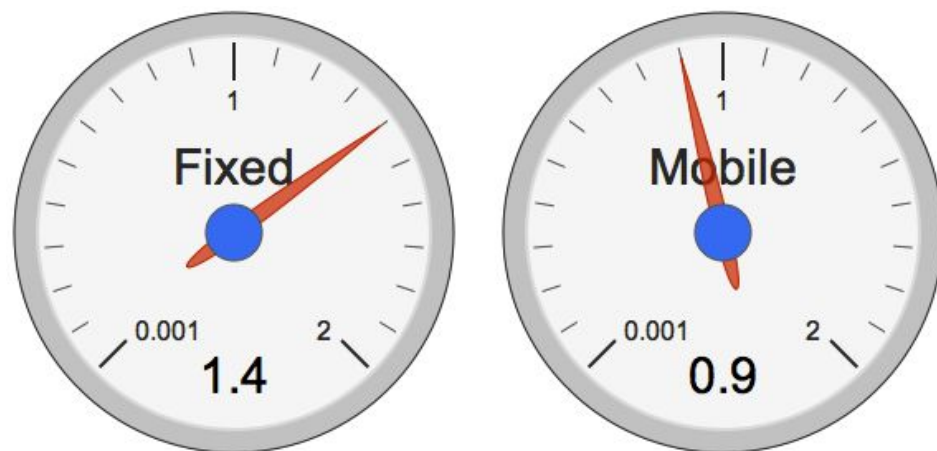
**Duration of visit (seconds)**



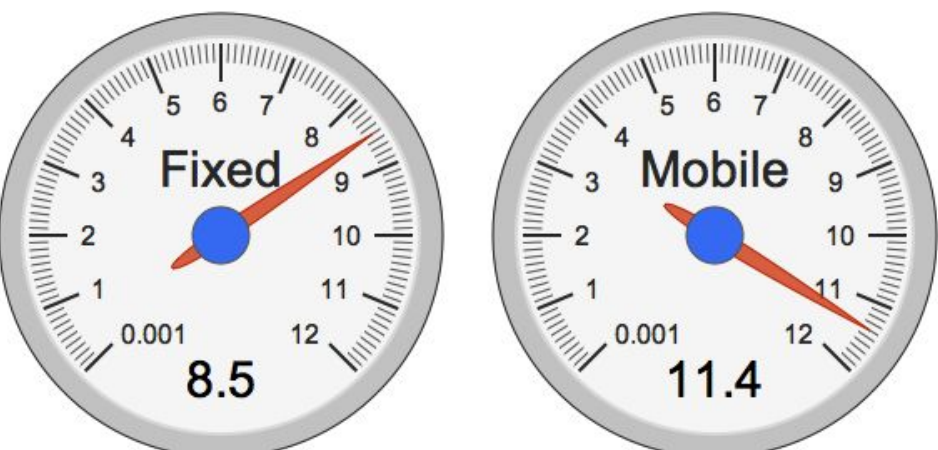
**Page views per visit**



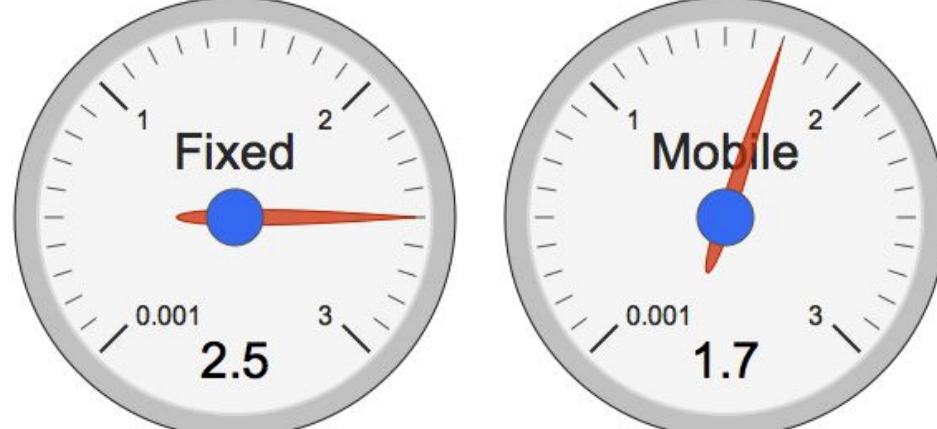
**Queries per visit**



**Time per page (seconds)**



**Record views per visit**



Visits from mobile devices are much less interactive: fewer records/pages viewed, fewer searches conducted;  
less time spent on a visit but longer on a page



# CIBER dashboard: mobile platforms compared

## Duration of visit (seconds)



## Page views per visit



## Queries per visit



## Time per page (seconds)



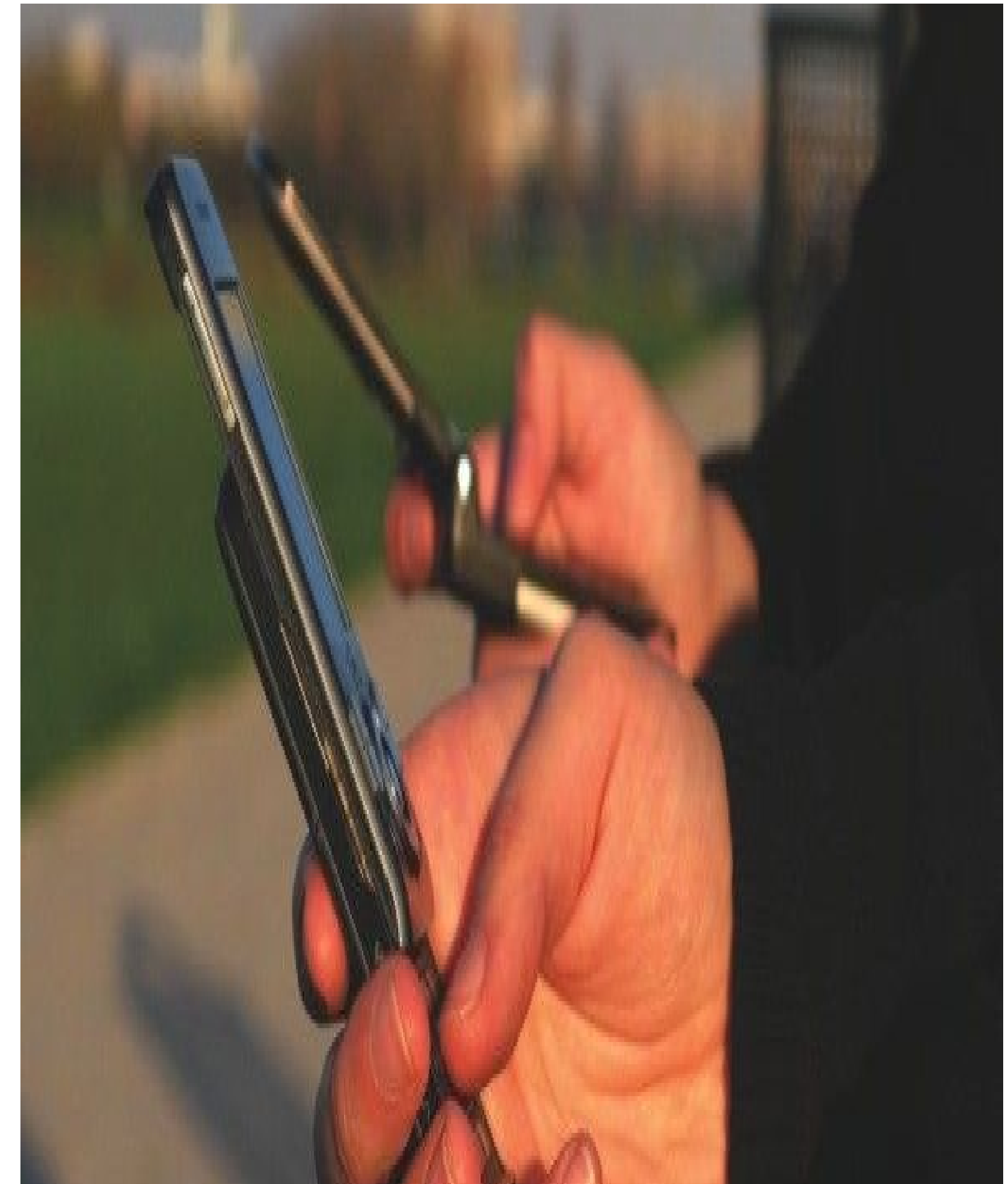
## Record views per visit



Big differences: limited screen real estate and slowness of the Blackberry clearly a limiting factor for in-depth research. On the other hand, the tablet iPad generates usage metrics that are not hugely dissimilar from desktops or laptops.

# Young people and mobile phones: the wave

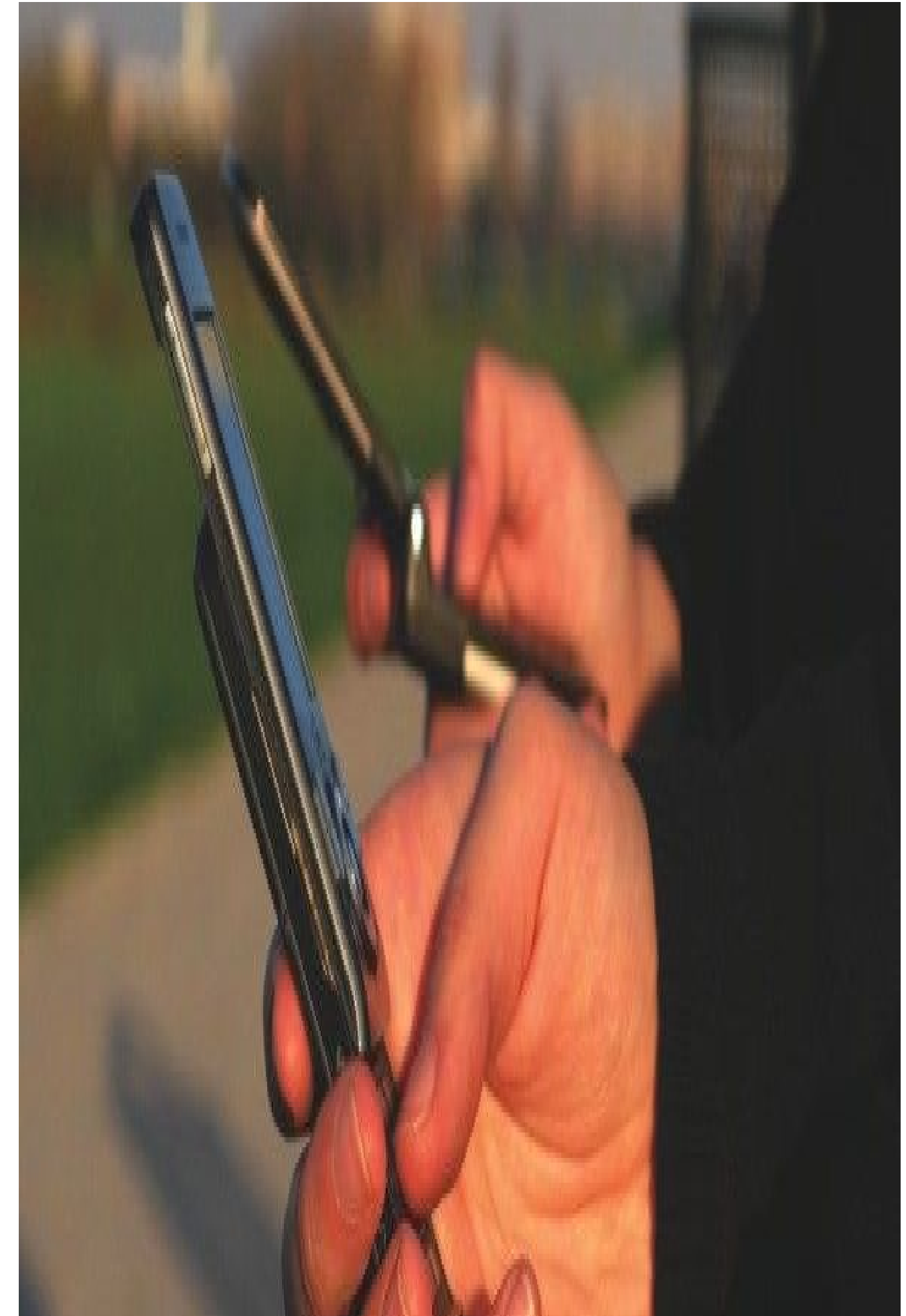
- Ask a young person about a library and they will point to their mobile phone
- Ironical. Phone once banned from libraries. Now become the library!
- We could not have come farer from the initial concept – no walls, not queuing and no intermediation





# The mobile, borderless information environment and challenges for libraries (maybe publishers too)

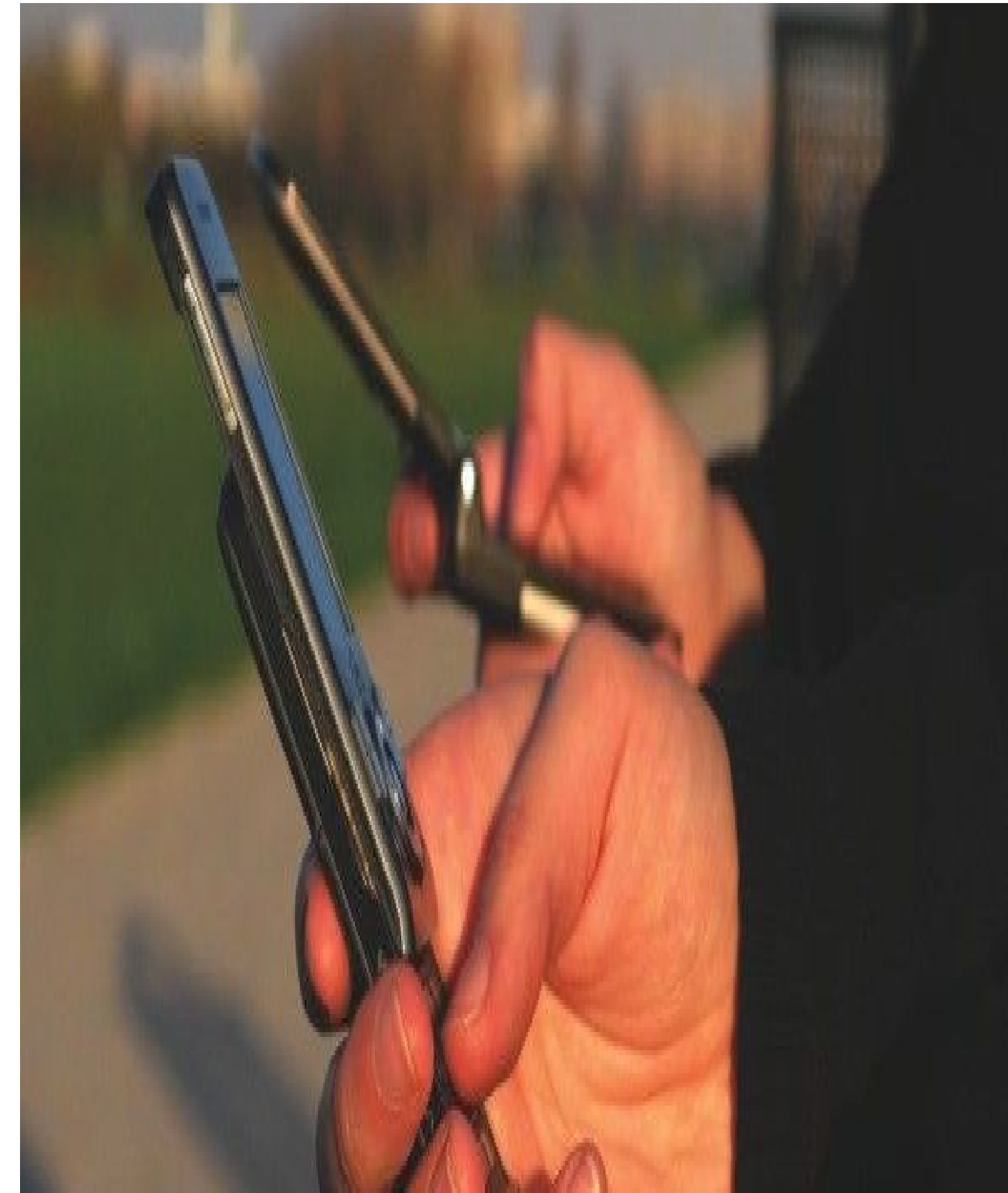
- **Constitutes another MASSIVE round of disintermediation and migration.** The users information universe is now at least that of the Library, sometimes greater. Researchers' information horizons once bound by the library but not anymore.
- Libraries perceived as *incomplete* sources of information and researchers increasingly less likely to trust librarians to make the critical decisions on what is and what is not in the walled garden on their behalf.
- On top of that Google Scholar, Social media etc. create a new value proposition by providing citation and other (alt) metrics so users can form own views on what is a good. Substitute for the intermediary.
- Libraries need to articulate value or rationale for their collections in a borderless information environment. Mobile just adds to the problems
- **The changed platform and environment transforms information consumption**



# Final reflections: is the web and the mobile device making us stupid?

"There is the desire of a consumer society to have no learning curves. This tends to result in very dumbed-down products that are easy to get started on, but are generally worthless and/or debilitating. We can contrast this with technologies that do have learning curves, but pay off well and allow users to become experts (for example, musical instruments, writing, bicycles, etc. and to a lesser extent automobiles)."

- Where are we going with information, learning and mobile devices?







## **Part 4: Social media**

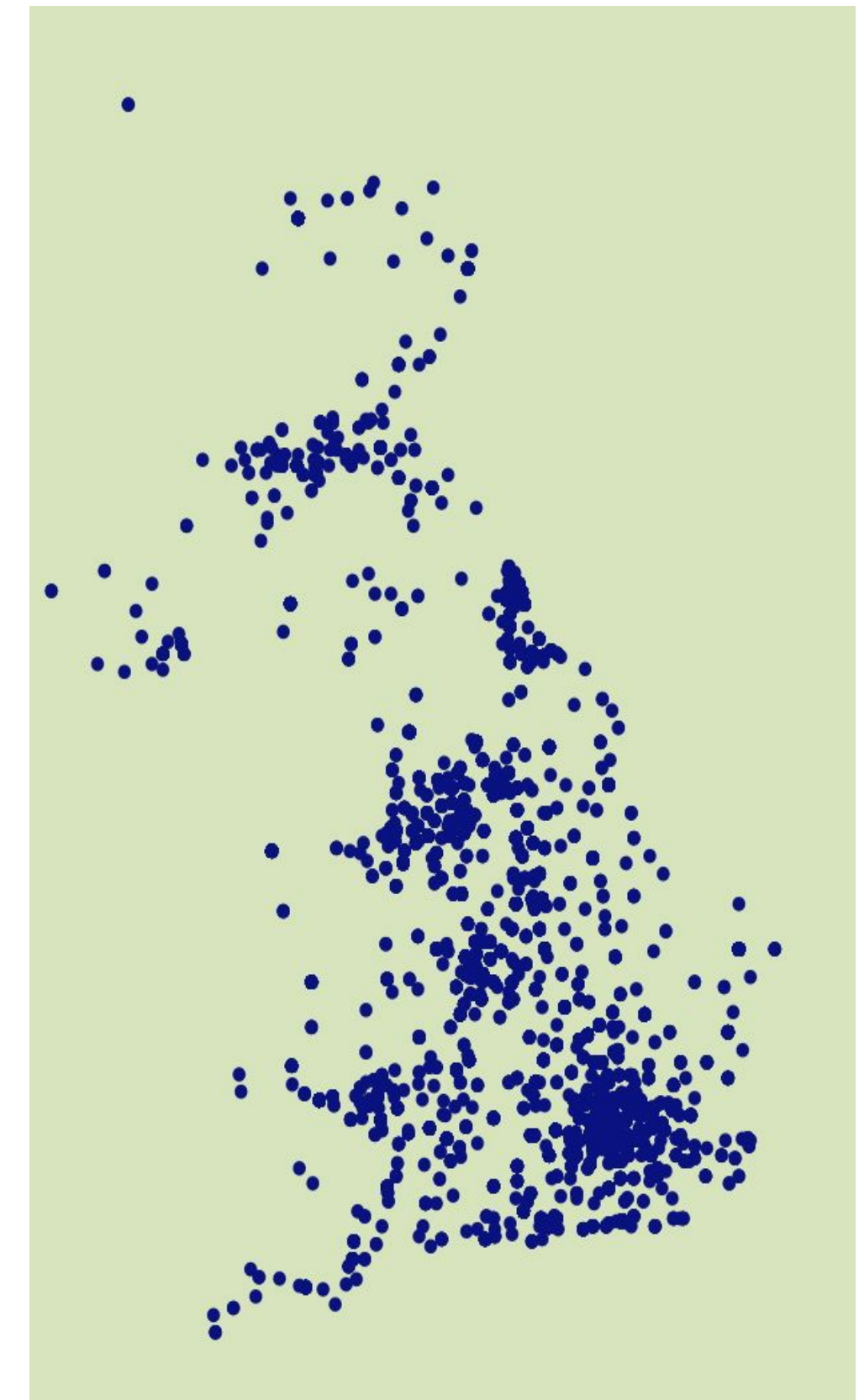
# Impact and role of social media: the basics

- Many researchers are engaged at least occasionally and occasionally very much the keyword.
- Role mostly in usage, rarely in citing and publishing.
- More critical and hesitant about trusting social media.
- Use the same standards to judge quality of social media as used for traditional sources.
- Benefited most informal scholarly communication and treated as such.
- Personal networks and circles of trust are central to formal scholarly communication and made much easier to maintain by social media.



# Perceived benefits

- Having an impact on all aspects of research process, especially among young
- Perceived benefits:
  - Ability to **communicate** quickly & effectively with diverse, remote audiences & wider public; great on self-promotion of scholarly outputs.
  - All about **building online communities and collaboration**
  - Creating new **data collection chances** (but validity and reliability problems)
  - Obtain **new ideas** / new takes on things and stimulation;
  - Increases **citations** as a consequence of providing greater digital visibility
  - Provides **alternative research space** where young researchers and those from developing countries can shine (a parallel scholarly universe).
  - Challenges **old concepts of trust** (blind peer review). Distrust of anonymity of peer review; openness most important; reach and connectivity new research goals.
- SM users more likely to use smartphones – compounds & accelerates behavioural changes
- Librarians unsure how to move in on it – another round of decoupling coming up?



# Social media – the negatives

Only a minority – early career mainly, thought social media was more than **a side-show**

Lack of interest explained by **validity problems** but also other reasons:

1. Many researchers novices and antagonistic towards SM as a result;
2. No time to try out;
3. Put off by current HE climate, which favours peer review, journals and citation indices;
4. Informal language of social media unsuitable for scholarly discourse;
5. No measures by which content could be evaluated; altmetrics unfamiliar and seen as popularity, not quality, indices;
6. No benefits to it– it didn't help their career;
7. Intrinsic openness of social media carried with it the possibility that non-experts would be involved: this represented “noise”.





## Diversity (age/seniority)

Early career researchers made more use of social media but scared to embrace it fully and camouflaged use. For them the benefits were:

- a) Fast track the development of a personal network;
- b) Facilitates collaboration among researchers;
- c) Finding researchers to work with (in real-time);
- d) Staying in touch with events;
- e) Stalking authors
- f) Taking full advantage of 'dissemination plus world' they were part of.

Relates closely to the need for researchers to build up their own circle of trust, relationships with people they confidently share their findings with, and keep up to date with changes in specialism



## Diversity (age/seniority) cont.

Despite aforementioned advantages young were reticent to contribute too much to the social media, largely because they did not want to let themselves down/show immaturity.

Worried use of social media could have a negative impact on career development. *It is so easy to comment today and in the digital world the record it always there. So, say you said something premature or immature twenty years ago, it could come back and bite you at a crucial time in your career development.*

Acknowledged social media was open to 'grandstanding', self-publishing and promotion, but, is this not all part of climbing the academic ladder.

Older social science researchers used social media to derive new/fresh ideas and for outreach – to connect to the public and practitioners.



## Diversity (country, subject)

- Researchers from less developed countries were more positive in their opinions towards altmetrics and social media, perhaps because more difficult for them to excel in traditional world of scholarly communications
- Surprisingly few differences by subject, but social scientists and humanities researchers slightly more likely to use social media and talk of it positively
- Humanities scholars were more likely to use social media to disseminate research.





# Conclusions

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## **Will social media change research and publication processes?**

On the basis of the evidence the answer has to be it is more a case of enhancing the existing system: online communities are the key component in all matters of trust and online communities are more easily/quickly built and maintained through the social media. They also provide a huge free PDF warehouse. Fast bag pick-up. And then there are the European Commission policy edicts fast forwarding us into a scholarly world they have envisaged.

## **The wedge?**

So what about the younger researchers and the transformational desires of some of them? Do we see them as the thin end of the wedge? It has to be said that the jury is out, but clearly they are more sceptical. The wedge also seems to be largely populated by young social scientists and, possibly, humanities scholars. There might be a hammer hitting the wedge



**Part 5: open access, open science etc.**

# Open access

Distrust of open access from an author and reader perspective.

Some confusion

Distrust diminishes considerably when OA journals published by traditional publisher

Those from teaching-intensive universities more positive on openness grounds. Felt also OA journals might help career: Universities might rank IF journals more highly but Google ranks OA higher in hits list, so if you want to be listed first to impress head hunters then OA provides a good career route.

Early career researchers liked *idea* of OA , but scared to embrace because academe not made up mind about it.

If published in OA journal, or cited one, might have backed wrong horse and found had published in a second-rate journal. *Might be a reputation threat.*





# Publishing: Open access

Few researchers admitted to OA publishing. Imposed (political), rather than actually needed. *It's open anyway.* Few realised traditional publishers produce OA articles

## **Worries:**

- Poor quality. *'Rubbish' 'vanity publishing', 'self-deluded authors'. 'Why would you want to (pay to) publish in something in a start-up, which is easy to get into and has no reputation.'*
- Business model undermines rigorous review; concerns about possible two track peer review, with OA articles being treated more leniently because of payment;
- Uneasy about author pay model that underpins gold OA . Passing of money sullies the transaction. Concern that you could pay your way into publishing;
- Poorly run and unprofessional. *Fails to recognise that there is a good deal of professionalism and standards behind publishing;*
- Concerns that academics might **have to** publish in OA journals and subscription journals might end up featuring different content and authors.

## Open access: usage

**Open access.** All the researchers we spoke to were beneficiaries of the big deal, which gave them easy access to journals. So OA no big deal. Nobody actually said they would rather not use OA material. However, even if they wished to, what is not clear as to how they could discriminate in the first place

Concerns of poor (or absent) peer reviewing of OA articles did not result in widespread checking of OA journals' peer review policies. But the interesting thing was that some actually did say that they did check policies which we bet they do not do for subscription journals

*And then there are the policy directives!*





**Part 6: conclusions**



# Change: better/worse than a decade ago?

More bad/mediocre stuff around because;

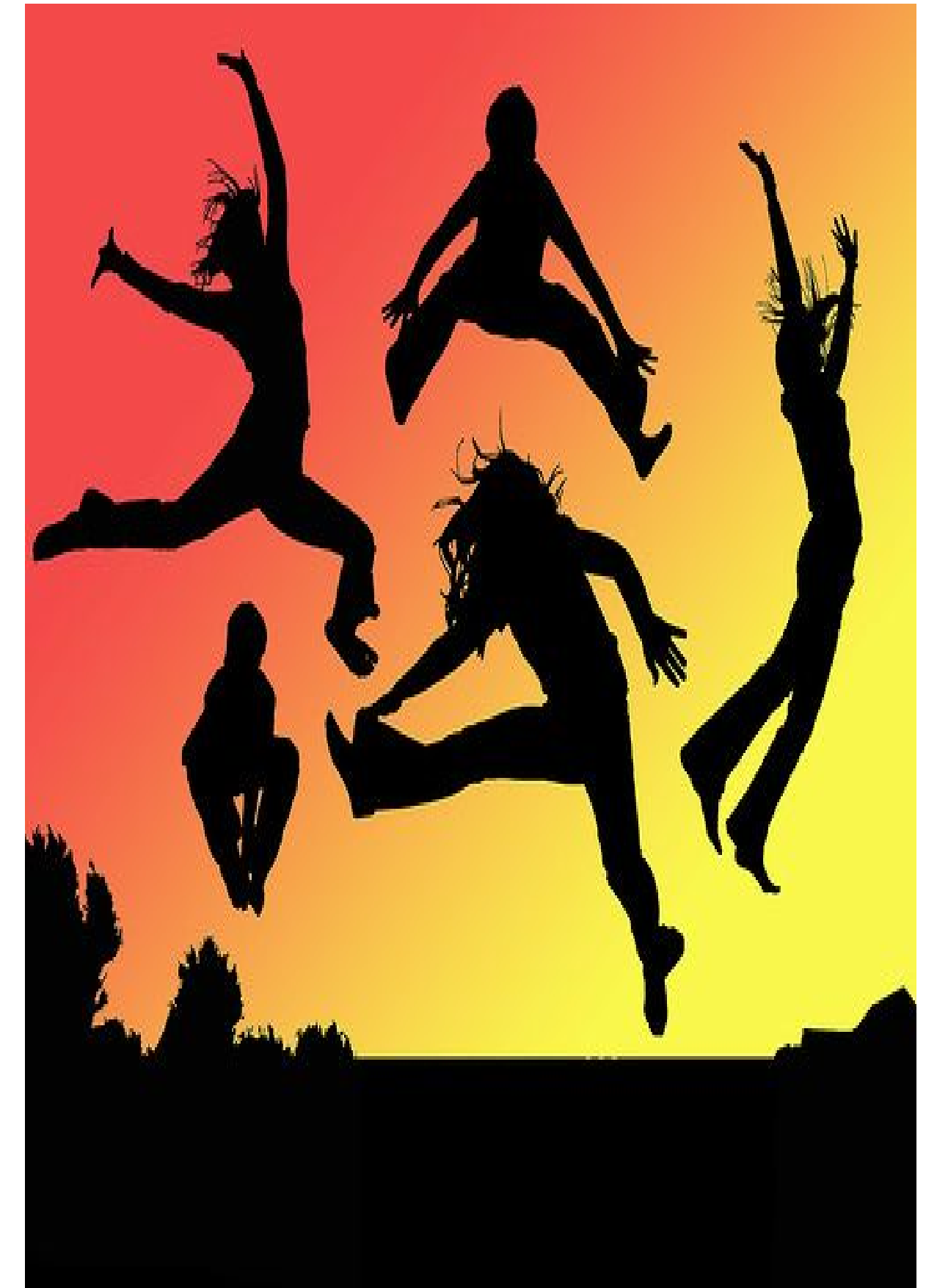
- a) more accessible
- b) more opportunities to publish

But thought that quality had risen over the years. Rise in quality meant could live with bad and boring stuff and overload

Rise in quality result of more people entering field and greater competition that comes with it. Niche/specialist journals that have taken full benefit of an abundance of run-of-the-mill material

*'There is a massive sea of mediocrity now because it is just easier to publish, but at the higher end the quality is better because of better training, greater competition and rewards for publishing'*

But didn't want any changes, they liked disintermediation



# Big issues and reflections

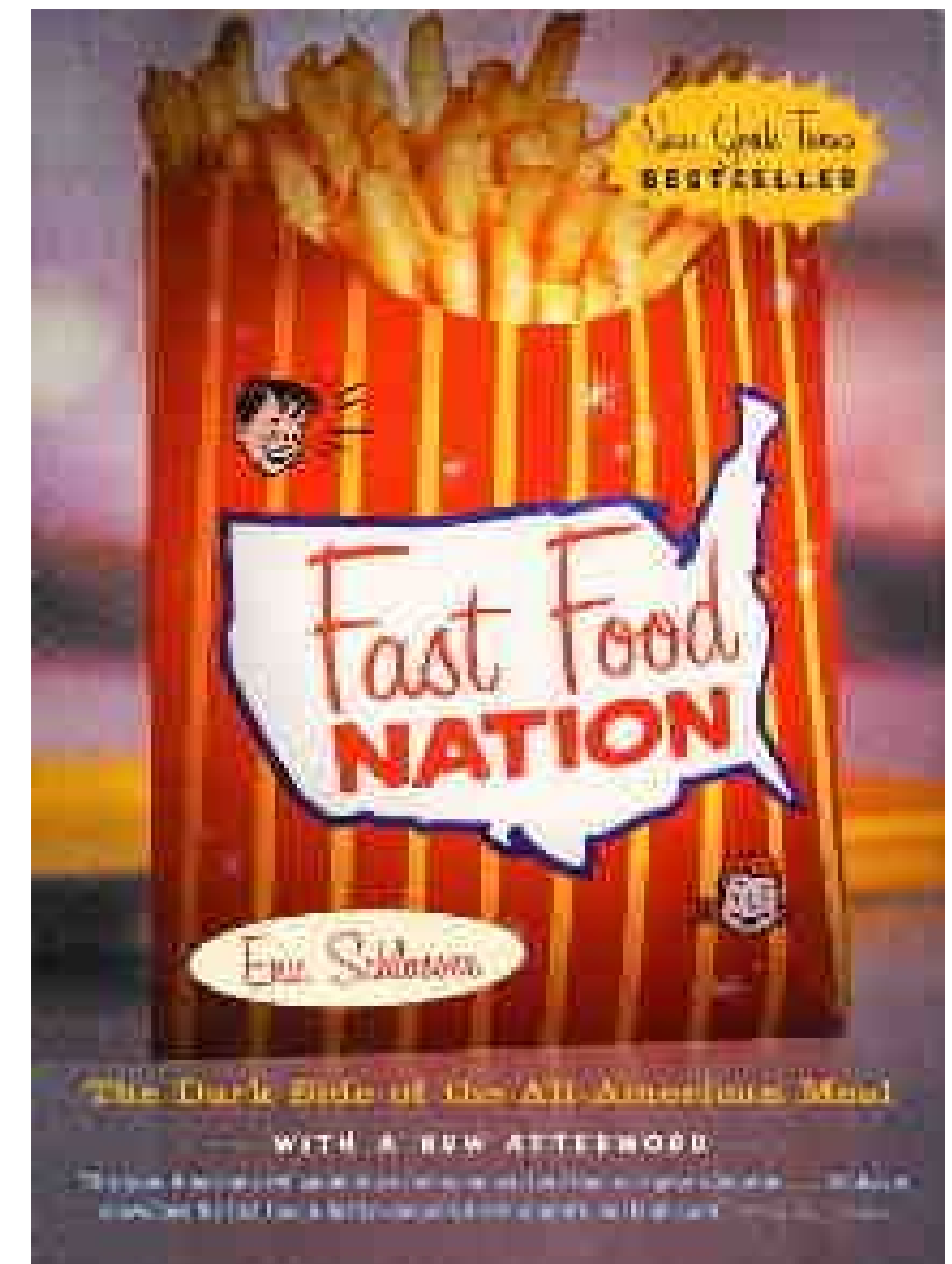
- Neurologists say digital behaviour changes pattern of connections in brain – introducing new ones/dispensing with old ones; young brains rewire quickly
- Brain gets endorphin rush for finding information. So skittering could impact negatively on established skills as it chips away at capacity to concentrate & contemplate. Digital makes us stupid! Don't bother to remember (shrinking)!
- *Propensity to rush, rely on point-and-click, first-up-on-Google answers, along with unwillingness to wrestle with uncertainties and an inability to evaluate information, could keep us stuck on surface of 'information age'; not fully benefiting from 'always on' information*
- Writing been on wall for years about lack of reflective reading but lulled into complacency by sheer amount of 'activity' taking place in cyberspace
- Dominance of power browsing or reading 'lite'.





## Big issues and reflections (2)

- Maybe McLuhan's universe of linear exposition, quiet contemplation, disciplined reading and study is an ideal which we all bought into and developed services around. But...
- Maybe always wanted to skitter and power browse and did so when we could (out of view). Difference now is that opportunities for skittering are legion and this creates more skittering and pace is not letting-up (twitter)
- And, the million dollar question are researchers prospering as a result? And, if so, could they prosper more?
- Well, we do know that that the best researchers in any subject are also the biggest users of the literature (but not libraries). Information literacy issues.
- But there is just a possibility we are heading for a plane crash (the Google Generation are about to land) and who is going to ensure that we benefit fully from the digital information revolution? Teachers, librarians, parents, government or Google? More on this in the workshop!





## **Part 7: implications for libraries**



# Need to meet the three challenges: the digital transition, disintermediation and decoupling (1)

1. Digital transition moved billions of researchers into digital space to conduct their information seeking and reading activities (once undertaken in library). It has much further to go what with the likes of **mobile devices, social media and research data**
2. **First consequence** is that information behaviour happens **remotely and anonymously**
3. Librarians helped make that possible but forgot to monitor and follow. The monitoring that is done is mainly at the **document** and not **user** level. This is partly because of a traditional library bias and partly not utilising the correct methodology. **Are you using the correct methodology?**
4. **Mind the gap!** Significantly (probably damagingly) researchers now do much of their searching and reading in someone else's space and the knowledge of **your** users is now in the possession of others - publishers, gateways, Google and the like. Not only decoupled but coupled to someone else!
5. Means that librarians **know less** and less about more and more of their users: by anyone's reckoning this can only lead to a plane crash.

# There are three challenges: the digital transition, disintermediation and decoupling (2)

6. The situation is made more difficult by the fact that – as you have heard from me – the virtual has **fundamentally changed** the way we seek, use, read and communicate
7. In the data vacuum there is the danger of working/utilising models on the basis of an **old, *uninformed*, paradigm**. Probably one that is bust.
8. Badly need to **visualise, conceptualise and act** what is going on and then establish **satisfaction and outcome measures** and **key performance indicators**. *Have you done so?*
9. **Second consequence** of the digital transition is **disintermediation** (DIY) which results in fast access and massive choice, courtesy of Google, the anarchic force. Part of a cultural shift: nailed on success if popularity is anything to go by. All users librarians now but don't behave like them.
10. Challenge is to retain brand and authority in these circumstances, when it is not even obvious who has been responsible/ involved in any information transaction. Danger that libraries only viewed in nostalgic (Or curatorial) terms. More on this in following slides.

# There are three challenges: the digital transition, disintermediation and decoupling (3)

- 11.**Third consequence:** in relative terms the library's information universe is the same as everyone else's. Once researchers' information horizons bound by the library but gateway services have replaced library website as main point of discovery.
- 12.On top of that, Google Scholar, Mendeley and ResearchGate create a new value proposition by providing citation and other metrics and greater context so researchers can form their own views on what is a quality output and what can be ignored.
- 13.Libraries seen as *incomplete* sources of information and researchers do not trust librarians to make the critical decisions on what is and what is not in the walled garden on their behalf.
- 14.To make things worse, libraries find it difficult to articulate the value or even the rationale for their collections in a borderless information environment. **Have you articulated it?**
- 15.Hence need for understanding use & users in the broad – you have to move focus from collection to the user. For that you have to look to publisher & gateway datasets to do this. Otherwise user understanding imperfect. **Do you do this?**

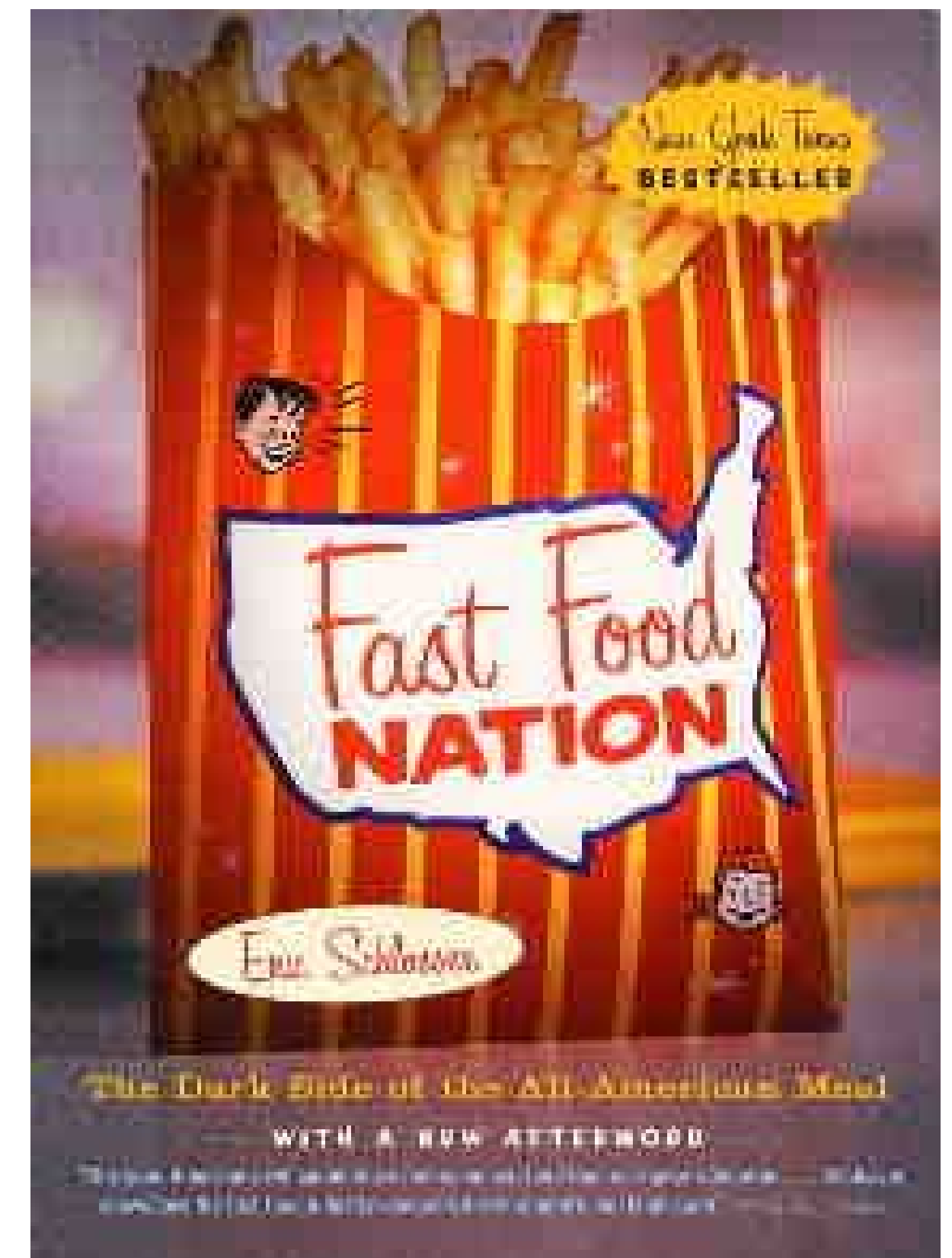
# Become real researchers of the digital environment

- Need non-intrusive, real-time methodology to study changing behaviour in anonymous, remote virtual space. Users leave behind digital footprints when visiting a website via mobile, personal computer, touch screen kiosk and digital television
- Make sense of footprints by turning *activity* represented in server or clickstream logs into *usage*; then stitch together to form patterns of behaviour; then, with the help of surveys/demographic datasets, turn *usage* into *users* and then '*sales*', *satisfaction*, *outcomes* and *KPIs* . Google Analytics (GA) can help
- Without this evidence base don't know what questions to ask and not only asking inappropriate questions, but also asking people stuff they don't know/cannot remember/make-up or don't want to tell you – look to logs or GA for this
- Focus group, interviews and questionnaire question framing needs to be informed by the log data. Integrated and triangulated methodology
- Don't know any research, national or university libraries doing this but know loads with federated search engines, institutional repositories, OA mandates etc. **Are you going to be the exception?**



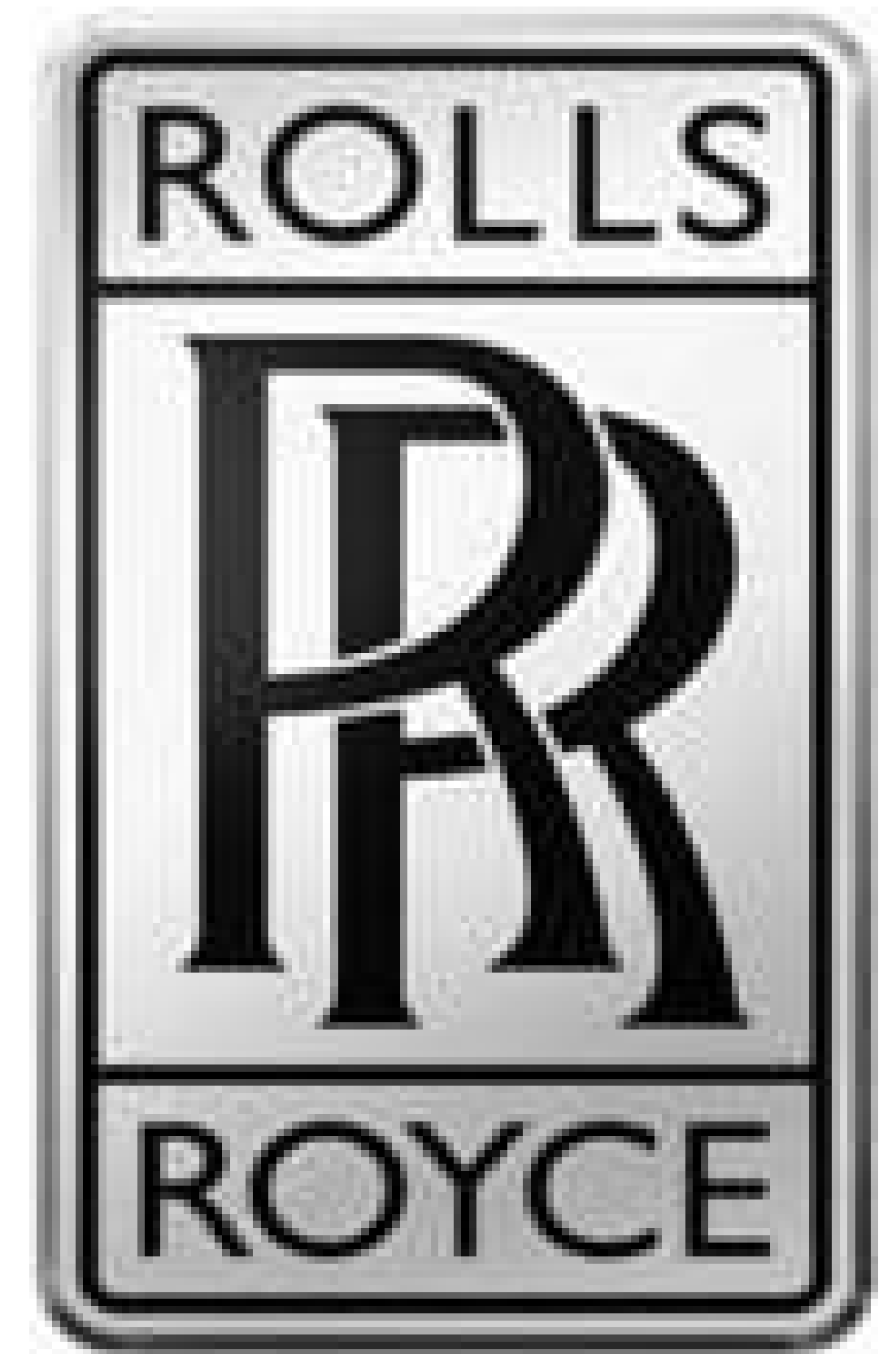
# Become authorities of the virtual environment: but don't mention 'literacy'

- Don't present this as an information literacy mission (researchers actually think they do it better than you!)
- Clearly issues arising out of being born digital and fast information culture: lack of a mental map, no sense of collection, poor idea of what is good/relevant and short attention spans, which means not everyone fully benefiting from being connected to the big fat information pipe and 'always on' information
- A need for remedial action and coaching; be pragmatic, call it value-added, information investment, raising your game, beneficial; and you have to prove it in these very pragmatic days. But it needs to be taught via tablet and smartphone, not at the desktop. **Q8 Do you do this?**
- We know how the best behave (best practice argument). Behave like the best and get the appropriate rewards?



# Do something about trust

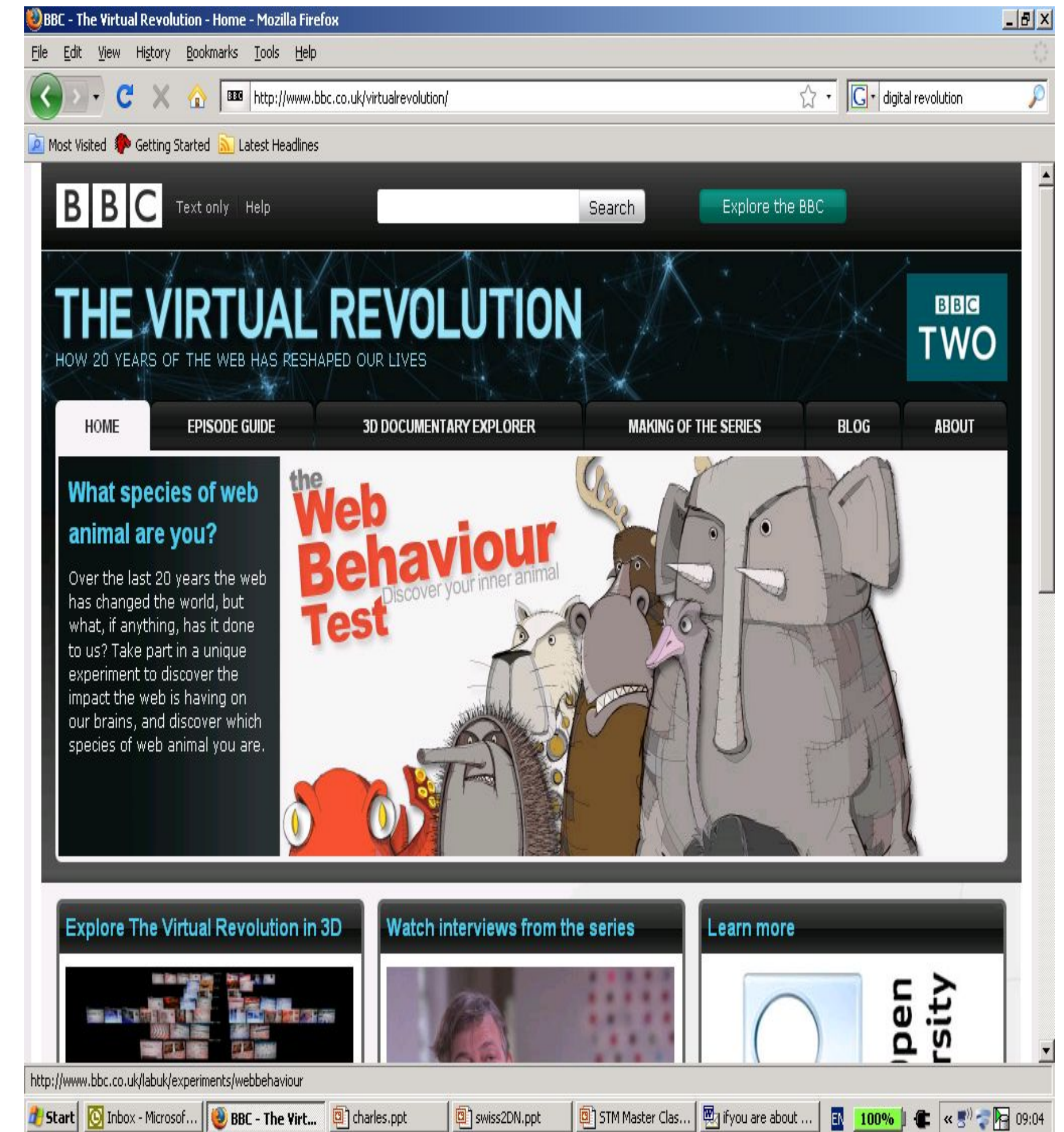
- **[snip from Sloan trust project on trust and authority in the scholarly environment]** Libraries not raised by facilitators, but by participants but all groups volunteered comments on libraries, and in a negative, joking ('what are they') or nostalgic fashion. These are academic researchers we are talking about; cream of the crop. Don't want to decouple from them!
- Remarked (occasionally joked ) about the marginalisation or death of the library. Researchers clearly don't go near them anymore; but they do feel nostalgic about them (like steam trains), but nothing else.
- Perhaps, unsurprisingly, they see role of librarians bound up with the buildings in which they work. Libraries, once the guardians of quality from a researcher's perspective anyway seem to have no active role at all to play today's scholarly communications environment; don't even see libraries as point of entry to the knowledge/information/ ideas they are looking for





# Why not take the boat out (and beat HR to it): web profiling

- Bet you don't know I am a dog!
  - This made us think if:
    - a) the reins have come off as a result of disintermediation and migration to the virtual space, and we are behaving so differently; and
    - b) we are moving most of our social and work activities to the web
- then we should replace personality profiling with web profiling
- And use this to recruit and help-self improvement (change animal)
- So undertook a huge experiment with the BBC
  - Actually generated interest among advertisers and marketers, in regard to selecting their staff, but no librarians. Why not?





# Web profiling

- Characterised behaviour by tracking what people did online in respect to a number of questions and relating it to demographic background, working memory, multi-tasking ability, use of social media etc. On the basis of performance people assigned a web animal which fitted their behavioural style. Eight animals types used. Take two:
- WEB FOX. *Foxes are good at finding information quickly. They are highly social, maintaining complex relationships with the other members of their social group, often using social networks, or other sites whose content is created by its users, as sources of information. Web Foxes are multi-taskers, able to do several things at the same time. found that Web Foxes tend to be younger (16-24), less experienced web users.*
- WEB HEDGEHOG. *Hedgehogs are careful internet users, taking their time to find the right information. They prefer to go it alone, rarely relying on social networks and are specialised web users, best suited to concentrating on one thing at a time. Web hedgehogs tend to be the less-experienced web users.*

