

Finding stuff

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Introduction

Admit it, today, finding stuff is very easy, maybe too easy. The senior author of this chapter should know because he has spent half his working life teaching students how to find information using Boolean operators, word proximity, field markers, nesting and all the rest of the paraphernalia associated with conducting an online search in the ‘old days’, and then only to retrieve an abstract. No need any longer; now you simply bung a word or two into an empty box, which thoughtfully corrects your spelling, and low and behold, thanks to a kindly algorithm or two, you get a huge, ranked list of annotated hits – fortunately, with the most relevant at the top. And while you might get an abstract as part of the search you will also get the whole thing and a lot more than text (hence our use of the word ‘stuff’), there and then, usually for free – but if not, there is always a digital friend from an online community who will give it to you. If that is the case, why then devote a whole chapter to finding stuff in the digital environment? The answer is that this revolutionary form of searching and finding has naturally enough led to a revolution in the way we seek information and consume it and commentators (and parents and teachers) are split as to whether this leads to better or worse outcomes as a consequence. Equally important for this book’s core readership – information professionals, libraries and, to a certain extent, publishers, once the holders of the keys to the information hoard – they have become bit-part players in the digital searching and finding business. How

can that be? Surely information retrieval has long been a central part of a librarian's expertise and professional canon? Read on for the answer.

Today people do all their searching on the web, and this should come as no surprise because everything they might ever want to look for (and loads of other stuff too) is there and it is all easy to find, despite what the naysayers say, at any time of the day or night. We have all come a very long way in a relatively short period of time; after all, it is barely 20 years since most searching was conducted in the library, frequently by a librarian on the user's behalf. For many young people there has never been another way to search: they were born digital, they are the Google Generation and, as we shall learn, it shows (Rowlands et al., 2008).

This chapter, then, is all about how people search the web; how they navigate the digital environment to meet their need for information and, particularly, how they employ search engines, notably Google, which they all love, to help them do this. It also assesses the role and position of librarians, once dominant in matters of searching and now clearly side-lined (Nicholas, 2012).

The chapter may appear to be futuristic and controversial in tone, but in reality it describes what is widely going on now and what will become even more widespread in the near future. We are all becoming conditioned, young and old, to the new ways of searching and consuming information and have forgotten or turned our backs on the old ways. But information professionals, and publishers to a lesser extent, have been slow to wake up to this. In short, they are in denial. There is a marked reluctance to accept that searching is universally thought to be easy, and this reluctance stems largely from the fact that librarians make capital out of portraying it as difficult. This chapter, therefore, identifies and describes a trend that we will all have to live with. While what is described here will prove challenging and controversial for some readers, it should act as a wake-up call for information professionals and policy makers who mistakenly believe that what we are witnessing is a deviant form of behaviour, a dumbing down that, with sufficient dollops of information literacy, can be put right. In fact, neurologists tell us that it is rewiring our brains. And with the avalanche of billions of smartphone users, information-seeking behaviour will become even further removed from the nostalgic ideal of many information professionals.

What is provided here is an accurate and truthful representation of how people search for information in the digital age, built on an enormous and robust evidence-base produced by CIBER over more than a decade of

researching the virtual scholar (CIBER, 2014; Nicholas and Rowlands, 2008a). Indeed, thanks to techniques such as digital-footprint analysis we have never known so much about information-seeking behaviour (Nicholas and Clark, 2012). Moreover – and this is very important in the fast-changing environment of the web, where it is said that an internet year is just seven weeks – much of the data presented is very recent indeed, coming as it does from an international research project on scholarly communication in the digital age conducted during 2012 (University of Tennessee, 2014), with much of the data yet to be fully published at the time of writing. So this chapter is built not upon the personal views of the authors, but on the views and behaviours of tens of thousands of people, mainly but not exclusively academics, researchers and students whom we have studied over a decade.

It follows, then, that this chapter is consumer driven; it is all about how people *actually* find stuff in a digital environment, not how they are *supposed* to find stuff; it is about what they *do* and not what is thought best for them to do by information literacy advocates. It is not prescriptive and preaching and we shall avoid technical jargon, such as metadata, discovery and federated search engines, as far as we can. It is about the evidence that CIBER has on everyday finding in the digital environment, in all subjects or professional contexts, and for any ‘stuff’ – journal articles, books, videos, sound, film, paintings, photographs and people.

Five CIBER research projects in particular contribute the evidence upon which the chapter is based:

- 1 The Behaviour of the Researcher of the Future (Google Generation). Funded by the British Library and JISC, 2007.
- 2 Evaluating the usage and impact of e-journals in the UK. Funded by the Research Information Network (RIN), 2008–10.
- 3 User driven development for Europeana. Funded by the European Commission, 2009–10.
- 4 Europeana: usage evaluation and analysis, 2011–13. Funded by Europeana, 2012–13.
- 5 Trust and authority in scholarly communications in the light of the digital transition. Funded by the Alfred P. Sloan Foundation, 2012–13.

More information and publications from these projects can be found at http://ciber-research.eu/CIBER_projects.html.

Digital information seeking

The internet has fundamentally and irrevocably changed the way we search for and find things, although, as we have already indicated, not everyone fully understands or accepts this, despite the weight and robustness of the evidence accrued. Searching for and consuming information in the digital environment is wholly different from doing the same things in the physical environment of a library. The digital transition has changed the paradigm and the game: we are all librarians now and it shows in the way we search.

Let us now take a long and hard look at how people, in this case academics, behave in the virtual environment. When research academics in the UK and USA, in the most recent study on scholarly communications in the digital age (University of Tennessee, 2014), were asked whether the digital transition had resulted in changes in their behaviour, the response was a unanimous 'yes it has', and the biggest change for them was that it all had become 'easier': it was easy to discover stuff and, also, easier to disseminate stuff. In fact researchers said that they were influenced in what they used or read by ease of access and, significantly, young researchers were the most influenced. This, of course, explains the widespread popularity of Google Scholar and the Google search engine among researchers. While librarians and scholarly policy makers like Jisc (the Joint Information Systems Committee) argue that the scholarly information terrain is becoming increasingly complex and difficult, what with Open Access publishing, institutional repositories and social media, it seems that researchers do not think so, largely, perhaps, because search engines appear to iron out the differences and difficulties. This is surely a classic case of policy makers and professionals talking up the difficulties for their own benefit.

Amazingly, very few researchers of the hundreds spoken to as part of the study complained that they could not find the information they wanted, when they wanted it. Twenty years earlier, access, delays in supply and overload would have been their biggest complaints; we have moved on. Easiness is unquestionably what everyone wants and this explains a very interesting characteristic of searching in the digital environment – the popularity and dominance of that empty, but inviting search box, which holds centre stage in all our searching. It follows that nobody really uses the advanced search facility that all websites advertise. When told of this phenomenon, publishers defend themselves by saying that librarians asked them for it! The reason why users prefer to search simply is obvious: (a) it is faster that way, and in today's fast and furious world speed is everything; (b) the search terms they use tend

to be so specialized that a simple search retrieves a manageable number of hits; (c) it is relatively easy to narrow the search down after an initial hit list is generated, especially if you, as most people do, look at only the first page; (d) it is easy to scroll through even big hit lists, especially since researchers (notably in the science-based disciplines) tend to make nearly all their relevance judgements at the top level, on titles, journal names and authors; (e) the first few entries generated by simple searches are generally found to include all that is needed to obtain the information required. The proof is in the pudding.

Connectivity

The second-biggest change is probably the massive information choice now on offer, courtesy of the web. Thanks to huge advances in connectivity (e.g. wireless) and expanding Open Access publishing, virtually everyone is connected to the 'big fat information pipe' supplying information 24/7, 365 days a year. In addition, the playing field has been levelled and privileged access is becoming a thing of the past. The average user today in a rural location or on a train now has, in many respects, almost as good access as a national or research-intensive university library user. Whatever some commentators may say, people, many of whom are new to digital searching, certainly avail themselves of that fat pipe. In fact, the astonishing level of access has made us drunk in information terms, because the usage logs of publishers' websites show that the digital user is hyperactive. All this means that few people spend much time on any one thing for long, always minded to move on to something else more interesting; the digital grass always seems greener on the other side of the hill.

Users would rather do many things lightly than do one thing deeply; we are all becoming web foxes (Nicholas, Rowlands and Williams, 2011). In other words, multi-tasking is the nature of the game. People bounce around the digital domain with gusto. This results in lots of fast and abbreviated searching and viewing. Most people view only one or two pages on a visit to a website, from the thousands available to them, and three is a lot of pages viewed. Users are also promiscuous, with around 40% not coming back to a website. They tend to 'bounce' the digital terrain. One-shots – one visit, one page – are the dominant user group. Lots of activity, then, but seemingly with little obvious reward, other than, perhaps, the thrill of the chase and the

prized possession of one snippet of information. From all this it would be easy to jump to the conclusion that a good number of users do not like what they find because of its bad/mediocre quality (as one academic we interviewed explained, "There is a lot of rubbish out there"), that much of it is irrelevant or simply that there is a surfeit of information. This is a consequence of: (a) the huge reach of the web and the great expansion in content, which naturally enough has brought about much more content, but also a lowering in overall quality; (b) the shotgun and gaming methods of search engines, which inevitably create many false hits, and this is something we shall return to. Having said this, a lot of search traffic will inevitably lead to 'dead ends'. This can be considered, more or less, a sub-category of 'bouncing': many searches lead to a page that is clearly not what is required, and the visit will bounce. It is foolish to assume that the site has somehow failed to capture or retain an audience in all such cases. Seventy per cent bounce rates are normal; this is the way the web works.

There are some other possible explanations for widespread bouncing behaviour:

- a) Search engine lists and embedded web links constantly enjoin users to move on and cross-compare; there is always a spur.
- b) The continuous refreshing of the digital environment causes churn; there is always something appearing in the shop window.
- c) The limited retrieval skills of digital consumers, many of whom are untutored or relative novices to online searching, mean that they do not always find what they are looking for. Thus, on average 2.2 words are used per query (to search the whole world of information!), frequently mis-spelt (but, hopefully, corrected by Google), and most people only ever look at the first page of Google results. What we have on show here is risk-taking on an enormous scale or, possibly, breath-taking pragmatism.
- d) Users leave their memories in cyberspace, assigning their memory to the likes of Google, which means that they easily forget what they did previously and have to start all over again (sometimes compounding errors previously made).
- e) It is a direct result of end-user checking because in a disintermediated environment, remote from the library and its sheltered/safe environment, users make trust and authority decisions themselves, and

- they commonly do this by sampling hit lists and then cross-checking.
- f) Users do not have the time to wade through the information that all too easily envelops them at every turn they make.
 - g) It is a function of easy and always-on information access, which engenders a topping-up or 'snacking' form of information feeding.

It follows from all this that nobody dwells or does much reading, or certainly not what is traditionally thought to be reading (that is, reading whole 'things', such as documents or chapters). Today a 'read' typically involves a paragraph rather than a page or article. Only a few minutes are spent on a typical web visit, and 15 minutes is a very long time to spend on a visit. If it is an article that the user is interested in, three to four minutes will be spent on it, and shorter articles have a much greater statistical chance of being viewed. Abstracts, because of their brevity, the condensation they offer and their navigational qualities, so crucial for the bouncer, have never been so popular, and ironically perhaps, in a world chock full of full text, some of which you have to pay for (abstracts are free after all). Importantly also, abstracts are the places where users go to cross-check and compare. This is not to say that people do not read offline, but long and deep reading is increasingly being elbowed out in an environment where we spend so much time online and have so many things to do.

A third change is that in the overcrowded and busy digital environment in which we find ourselves, searching and navigating is proving so attractive and rewarding that people spend much more time on looking than they do in consuming what they find. We were told by one academic that they went online to avoid reading; viewing has replaced reading. The fact that, in a recent study, usage logs show that only around 3% of visits to a publisher's website result in a download bears this out. People like looking, especially now that things are so accessible and searching is so easy. Finding things by happy accident has always been the most rewarding form of searching and the difference now is that it happens all the time. Neurologists tell us that this is because the brain gets an endorphin rush for finding information – but not, it appears, for reading what has been found.

A fourth change is that the 'trusted' big fat information pipe that people are connected to for usage purposes is, of course, not the library or publisher's platform; it is the internet. This means that assessing the trustworthiness and authority of content is much more difficult and users have to do it for themselves. There is so much content to deal with, so many

players responsible for it, most of whom are unfamiliar. You do not even know whose information it is. As with the case of all digital consumers, generally they either choose the first one up on the search list, trusting the search engine to have made the decision for them, or seek refuge in trusted brands, although the brands now trusted are not the ones that were originally trusted. Thus, for instance, today the brand is Wikipedia and not Encyclopaedia Britannica. The rise of trust proxy metrics (citation and usage counts) and altmetrics (e.g. social media mentions and likes), together with the wisdom of the crowd (personal recommendations), has provided some relief for the confused searcher.

A fifth change – and this is very recent – is that most people today search the web via a mobile device, a smartphone or tablet. This means not only that most searching is conducted in the digital environment, but that the physical place where searching is conducted has also changed. Searching is now undertaken from the home or on the go (train, plane or bus), rather than in a library or office; this has wrought big changes in how and when we search. We no longer search in a dedicated space; we tend to search outside office hours (late at night is now the searching rush hour) and in the social space (home, coffee bar or pub). Not surprisingly, then, this searching is proving to be different. We can best describe it as being information ‘lite’. Compared to PC/laptop searching in an office or library, it is typically much shorter and less interactive, less content is consumed and it is less likely to lead to satisfaction and a return visit. There are many more one-shots – one page viewed and one visit made (Nicholas, Clark and Rowlands, 2013).

The sixth change is that we now have the searching equivalent of the Holy Grail, the one-stop shop. Thanks to the digital transition and the web, all types of information and objects (stuff) can be found together. Information seeking is no longer associated only with text. Indeed, a recent evaluation of Europeana (www.europeana.eu/), the multi-media gateway to cultural objects in museums, libraries and galleries in Europe, shows that film and video are the most sought-after and visited media.

The last change is one that nobody talks about. Now, surely, as the argument goes, the result of connecting the consumer directly to the big fat information pipe is that they will drown in the information flood. Wrong; because users do not even mention information overload, unless prompted to, and then they explain that they have no problems in this respect. The sheer benefits of unparalleled and unlimited access to information are so

great that they more than compensate for any problems that arise from an over abundance of irrelevant, poor or mediocre information. The general view was summarized by an academic researcher who said they preferred ‘to have problems with information management rather than problems with information retrieval’. Finding things is relatively easy; managing/filtering the information flood is more difficult, requiring experience and skill, which, of course, established researchers have in buckets, and which early-career researchers compensate for by utilizing and maximizing their personal networks – something that is much easier to do now with the likes of ResearchGate and Academia.edu, and something they are very good at.

Searching tools

The vast amount of searching that takes place on the web is conducted through search engines, and specifically one search engine, Google. So dominant a force is it that according to the *Sunday Times* (Duke, 2014) Google accounts for more than 90% of web enquiries in Europe. Search engines are brokers of access; they are the gateways to content and keys to the web door. In a nutshell, they are the strategic link in the communications process. They are the ultimate one-stop shops and they have massive shop windows with displays of a whole world of information. And search engines are not just popular with the general public and young people (the younger the person, the more likely they are to use search engines), they are also very popular with academics, even among physicists.

Google and its handmaiden, Google Scholar, are by some considerable margin the most popular and trusted finding tools for academics, regardless of discipline and age, although among younger academics and students they are even more popular and trustworthy. Library websites (more on this later), federated search engines and publishers’ platforms are rarely ever mentioned by the academics we have interviewed. Subject gateway sites, such as PubMed Central, are mentioned positively, but not frequently. It seems as though search engines and gateway sites are preferred for discovery, and publishers’ platforms are used for full-text pick-up, should that be needed. Researchers use gateway services such as Google and Google Scholar, PubMed, Scopus and Web of Knowledge because they are typically seeking a wide search horizon (Nicholas, Rowlands and Williams, 2011).

This has to be a real turn up for the books, because, unlike most other

user communities, academics are familiar with retrieval systems, have choices and have access to their own library systems and many publishers' platforms too, and are very picky because of their particular trustworthiness concerns. If they are convinced of the value of search engines, then everyone else should be too.

Further evidence of Google's popularity and trustworthiness among academics can be found in the referral logs of publishers' websites. Thus, take the typical case of a medium-sized, international scholarly publisher: 22% of traffic comes into the site from Google, another 13% from Google Scholar and another 1–2% from other search engines. These are followed by subject gateways, such as PubMed Central and The National Center for Biotechnology Information. Significantly, by comparison, relatively little traffic comes from academic institutions and their libraries. Even physicists are smitten by Google, and they are richly endowed with powerful information services such as SPIRES and ArXiv. Thus, just four months after Science Direct content was opened to Google indexing, a third of traffic to the physics journals on the site came via that route, and that from a standing start.

A very different case study, but one that tells a very similar story, is that of Europeana. In order to increase usage, Europeana, ironically originally established as a European alternative to Google, which at the time was thought by the French to be too English-centric, allowed Google robots deep into the website in order to index content (previously it had been restricted to indexing the home page). The impact was huge, with usage growing by some 400% in a very short period of time. At the time of writing (2013) 70% of the 4.5 million visits to Europeana in 2012 were search referrals, nearly all (97%) from Google. By contrast, runner-up Bing, Microsoft's engine, accounted for just 0.5%.

Google's popularity

The relatively quick take-up and popularity of Google among academics (Jamali and Asadi, 2009) can be put down to a number of factors:

- 1 Usage is a scholarly activity in which researchers have relatively more freedom to experiment and be more innovative because it is less regulated – much less so than citing, or where you publish. It is also the

area where there has been the most change and innovation as a result of the digital transition, especially since the scope and use of commercial search engines has increased so markedly, incorporating a wider range of information sources and so providing even greater choices.

- 2 Citation data and indices (supplied by Google Scholar) are much more accessible and, as a consequence, it is much easier to determine quality and to establish trustworthiness in a disintermediated environment. If an academic is unfamiliar with an author they will 'Google' the author for previous work, university affiliations and other credentials.
- 3 Academics find Google a very useful pathfinder for navigating unfamiliar fields. This is when hit counts are most beneficial. Many researchers start with Google or Google Scholar and then switch to a more specialized database, such as PubMed Central, when they have a more defined search query.
- 4 There are occasions when authority or ranking are of only secondary concern in determining what to read. This is especially true when researchers are looking for something new, fresh and creative and are as likely to find this in low-ranked ('dodgy') journals as in higher ones – arguably, more likely to. In these cases a 'quick and dirty' search in Google or Google Scholar can be productive, especially in delivering interdisciplinary material.
- 5 It provides the highly prized ease of access in buckets and the widest information horizons of all. Google Scholar was thought to be surprisingly good by senior research academics; surprisingly, because researchers did not expect a quality scholarly product from such a commercial organization that has so many (commercial) fingers in so many pies.
- 6 Google provides access to 'unknown unknowns'. In general, there is a belief that one is able to identify more of the relevant sources for one's research than was possible before improved methods of searching were available. Despite this, however, it is admitted that the new ease of searching has led to laziness and that hard-to-find documents are less likely to be used.

What is really interesting is that the hugely popular Google search interface is simplicity itself and seems to fit the no-nonsense, smash-and-grab, in-and-out approach of today's digital-information seeker. Of course, it also helps

to promote this type of behaviour: a classic chicken-and-egg situation. What is perhaps surprising is that it has none of the functions that ‘experts’ recommend. There is no wisdom-of-the-crowd stuff here; it is not immersive and the user has to do all the work, which is to peruse an extensive hit list. But it is fast and effective, and that is its trump card.

Search engines, with their empty search boxes, massive reach and (endless) ranked hit lists have shaped information-seeking behaviour so much that it is barely recognizable from the descriptions you find in the standard texts on information-seeking behaviour. Search engine users have a highly identifiable way of searching that marks them out from other online communities. They are typically what we call bouncers, people who view one page in a visit, spend very little time on it and do not always come back. They have followed a direct link to the article text or its abstract, it is of interest or maybe not. In either case it is probable that the next action will be to move on to another reference or new search rather than stay to browse the website. They tend not to be loyal or sticky – except, that is, to the search engine. Search engine users are also more likely not to arrive at the home page; the engine takes them direct to content. They do not come in by the front door – web designers please note. They also tend to be smartphone users.

It is common wisdom that users look at only the first few results of the hit display, but this is not always the case and images can be the exception: the explanation for this lies in the fact that the eye can quickly scan a lot of images with a lot less effort than it takes to read and assess the relevance of a text-search result. Information seeking related to non-textual objects is clearly different; we have already mentioned the longer dwell times associated with images.

Libraries (and publishers)

Libraries have been disintermediated and marginalized as a result of the digital transition. Information do-it-yourself has become the norm and Google and the like have helped to accelerate the process by providing the consumer with a search facility par excellence (Nicholas and Rowlands, 2008b). When you talk to academic researchers – clearly a core academic library community – about scholarly information, libraries, if mentioned at all, are mentioned generally in a negative or nostalgic fashion. They clearly do not go near them, in terms of physically visiting them, anymore. This

probably comes as no surprise to anyone, but what surely comes as a big surprise is that neither do they appear to use them remotely and digitally. They just do not see libraries as the main point of entry to the knowledge/information/ideas they are looking for. Even though they do use e-journals (sometimes unknowingly) courtesy of library subscriptions it could be the human resources department or the research office that provides them, as far as they are concerned. Furthermore – and this could be part of the explanation – academic researchers do not feel the need to search very often because anything that they might be interested in comes to them through their personal networks and circles of trust, and increasingly they are alerted through social media channels. Libraries, once the key to the information door and the guardians of quality, seemingly have little role to play today in helping users to find things.

Nor do academics talk about publishers' platforms in respect of their information-seeking behaviour. Yet libraries and publishers think they are very important. Publishers' platforms are used as warehouses, places to obtain the full text. This, together with the fact that academics tend to obtain much of their reading material from colleagues and, as we have heard, do use and trust Google and the main subject gateways to navigate, might well explain the short visits so characteristically found in the usage logs of publishers' and library websites. After all, if you know what you are looking for already, you are not going to dwell long in the publishers'/library space. An information case of fast bag pick-up.

For librarians, the mobile device is a big challenge, taking disintermediation to another level. The library's information horizon has not expanded as fast as everyone else's. Scholars' information horizons were once bounded by the library, but not anymore. Google has opened their information horizons, and they like big ones. Libraries are increasingly seen as *incomplete* sources of information, with users not trusting librarians to make the critical decisions on their behalf on what is and what is not in the walled garden. Librarians have not developed good policies and practices to deal with a borderless and mobile information world. In fact, the term 'walled garden' is a put-off to many searchers.

What libraries have generally failed to understand is something we learnt very early on in our research. Users, young and old, like it easy. Thus, in a focus group PhD students from a number of research-intensive universities told us something that threw us all initially. They said that they could not

understand why they had to do all the work in getting something from library and publishers' websites. At first this was attributed to laziness, but it turned out not to be that. They felt that the content was locked, submerged, and they had to dig a lot to see it, when maybe the service could make some things available automatically – the data coming to them, rather than having to chase it. They also said something else that was very interesting. They said that the websites were quiet, it was as if nobody was there; there were no signs of anyone else using the service, they left no clues. A quick inspection of library and publishers' websites will confirm the truth of what they said; and of course they did not say this about Google, because it is easy to use and the work you have to do, the sifting, they don't mind doing.

Conclusions

Maybe Marshall McLuhan's (1962) universe of linear exposition, quiet contemplation, disciplined reading and study (and we can add in 'advanced searching') is an ideal which librarians, scholars and society readily bought into and developed services around. However, maybe we always wanted to bounce, skitter, power-browse, grab snippets and view rather than read, but in the batch-processed, analogue, narrow and heavily regulated world of the physical library it was just not possible. The difference now is that opportunities for skittering and for grabbing information snippets are legion and in our own backyard (in our pocket even), and the opportunities are increasing as we write; there appears to be no let-up; just consider the march of Twitter and smartphones.

Maybe, just maybe, bouncing or skittering is an effective, but different, learning approach, and better suited to the crowded and dynamic digital world and our low attention spans. That is the optimistic take on the evidence, but there is a small possibility that we are heading for a plane crash; after all, the Google Generation are about to land in a university or office near you (Rowlands et al., 2008; Nicholas et al., 2011). They are, of course, the born-digital, the ones who know no better or other way; technology has conditioned them. According to some commentators, Nicholas Carr (2010) among them, skittering will impact negatively on traditional learning skills as it chips away at the capacity to concentrate and contemplate. He argues that the digital is making us stupid and depriving us of our memories. We are with him in part, because there is plenty of evidence that we have moved to a fast-

information society, in the way that we have become a fast-food society, and the consequences will probably be similar. The 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 indeed keep young people (and eventually the whole of society) stuck on the surface of the 'information age', not fully benefiting from 'always-on' information. The writing has been on the wall for years about the lack of reflective reading, but we have been lulled into complacency by the sheer amount of 'activity' taking place in cyberspace, much of it, of course, traffic noise. The smartphone, shortly to be the platform of choice for searching the web and the purveyor of information 'lite', could be the straw that breaks the camel's back. It could just be the end of civilization as we know it.

And what then of Google, in a way the architect of much of the behaviour we have been agonizing over? Well, Google is a classic case of the tail wagging the dog. Who would have ever have thought that a retrieval, rather than content, service (although Google is in fact changing its portfolio) would conquer the world and become one of the world's most profitable businesses and biggest brands? Of course, finding is at the heart of everything we do today, even shopping; it's just the nature of the digital environment. So maybe we should not be so surprised. Thanks to Google, people are discovering that searching and finding (navigating) can be very pleasurable indeed. How, then, do we explain the perilous position libraries currently find themselves in, side-lined and largely anonymous in the digital world? After all, until Google came along, libraries had a monopoly on searching and finding, but never attracted much of a following; they really majored as warehouses, and that is how they are largely seen in today's digital environment. Google trail-blazed when libraries should have done so – certainly in the scholarly field – so why did it not happen for them?:

- Users probably do not like delegating searching to a third person because it is personal and time consuming; they also do not like delaying it, husbanding it to do it later in dedicated spaces.
- The information systems that libraries provide as a gateway to internal and external sources are designed more for the use and benefit of librarians. They are never easy to use.
- Library collections are perceived to be largely local and limited in scope, and this brush also tars the provision of access to external sources.

- Knowledge about library services is poor and this leads to a lack of trust on the part of the user.
- Until Google came along, all search and retrieval services were heading in the wrong direction, a direction that was too complex for the rapidly expanding population of digital consumers and searchers.

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