



“Time spent searching” – A chronology and recent research

Martin White

Intranet Focus Ltd.

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About the author

Martin White has gained international reputation over the last twenty years for his understanding of how to manage enterprise and intranet search applications for the benefit of the organisation. Many of his clients have been multi-national organisations with complex information management and information discovery challenges, He specialises in finding solutions for organisations working in multiple languages.

Martin has written four of the five books on enterprise search management, including Making Search Work in 2008 and the second edition of Enterprise Search in 2015. His report on Achieving Enterprise Search Satisfaction was published in 2018 and he is currently writing a book about the Enterprise Search Experience. He is the author of a monthly search column in CMSWire and is Editor of Informer, the newsletter of the British Computer Society Information Retrieval Specialist Group.

Martin has been a Visiting Professor at the Information School, University of Sheffield, since 2002, specialising in information management and interactive information retrieval (IIR). He is a Fellow of the Royal Society of Chemistry, a Fellow of the British Computer Society and a member of the Association for Computer Machinery.

<http://intranetfocus.com/>

Note

This is a slightly revised version of <https://www.linkedin.com/pulse/time-spent-searching-chronology-myth-some-recent-research-white/> published on 26 May. Some additional links have been added in and there is a new section on Seeking, Searching and Finding on p9.

Introduction

The quest for 'benchmarks' in the information business seems never ending. It is very common to see search vendors and search pundits state as a certain fact that employees spend 2.5 hours a day searching for information. The source for this is an IDC briefing paper published in 2001.

This briefing paper is a slightly revised version of a column I wrote in LinkedIn Pulse. It is often difficult to find these columns and they are rarely indexed by Google. I have set out the chronology of this 'evidence' and present other more recent research that sheds light onto the processes of seeking and searching.

I should say at the beginning that many of the papers cited in this column are not open access. That is the way of the world of academic publishing at the present time.

1998 - 2001

If you read the 2001 IDC briefing paper **The High Cost of Not Finding Information** there is a comment on the methodology used.

"We use a general estimate that the typical knowledge worker spends about 2.5 hours per day, or roughly 30% of the workday, searching for information. This number also needs to be adjusted to reflect the circumstances of each specific enterprise. IDC believes the number represents a general average of time spent searching based on the ubiquity of intranets within organizations."

This makes it clear that it is an estimate based on the ubiquity of intranets. Intranets may have started to be ubiquitous in the USA but progress elsewhere was slower.

The briefing paper goes on to reference a paper published in 1998 by Professor Kit Sims Taylor, a distinguished economist.

"A study by Kit Sims Taylor found that knowledge workers spend more time unwittingly recreating existing knowledge than in creating new knowledge. (This study was presented at the International Conference on the Social Impact of Information Technologies in St. Louis, Missouri, October 12-14, 1998. For more information, visit <http://online.bcc.ctc.edu/econ/kst/BriefReign/BRwebversion.htm>). According to Professor Sims, roughly one-third of productive time is spent in knowledge reworking. The other nearly two-thirds is spent in knowledge finding and communication, with only about 10% of time spent in actual creation of new knowledge."

This link is no longer active and it is not easy to track down the paper. However there is a link to the paper at

<https://holtz.org/Library/ToFile/Technological%20Unemployment.htm>

Overall, this is a well-argued paper on the future of knowledge work from a highly-regarded economist. The statement related to time spent searching for information is not in the text of the paper, nor is it cited as a source. There is a table about the time spent by knowledge work but this is

not directly referred to in the paper by Professor Taylor (not Professor Sims as referred to in the IDC paper). I find it difficult to believe that any organisation would be content to have its knowledge workers only spending 10% of their time on creating new knowledge.

Professor Taylor died in 2012 so we have no way of checking on his sources and methodology.

The IDC briefing paper goes on to quote from the paper

“Whirlpool expects to increase productivity of its product designers by 30 percent.”

The way that this is presented could lead the reader to assume it is from Professor Taylor’s research. In fact it is a quote from the Financial Times 24 June 1998.

2003

IDC continued to publish briefing notes on the issues around the time spent searching. In 2003 it published **Moving Beyond Search: Advanced Data Gathering in the Enterprise**, which included the comment

“Nearly 70% of respondents (knowledge workers) to IDC’s KMWorld Conference search survey indicated that they spend five or more hours per week doing online information searches, with 16% indicating that they spend 12 hours a week or more doing searches”

So by 2003 the amount of time spent searching has moved substantially away from the 2.5 hours a day used as an estimate in 2001 and still extensively quoted by the search industry to this day!

The terminology is interesting. In the information and knowledge profession the term ‘online information searches’ was commonly used at the time to refer to external research services such as LexisNexis and Westlaw.

Attendees at this event would have regarded themselves as professional searchers, a term which has recently reappeared (see below). It is quite possible that these professionals were spending this much time searching but extrapolating this to all knowledge workers in an organisation is highly questionable.

*(This is confirmed by a statement in its 2011 paper **Unified Access to Information – Less seeking, more finding***

“In 2000, when IDC started surveying enterprises on this topic, many users were still highly trained information professionals who had years of experience with online information systems and were comfortable with complex query syntax for searching databases and text sources.”)

2004

In 2004 IDC published **A 360 degree view of enterprise information**.

In this paper there is this statement

“In a series of IDC studies in 2001, 2002, and 2003, we asked users of information systems to tell us how many hours they spend searching in a typical week, and then to rate their success in finding the information they were hunting for. Most users told us that they spend between 15% and 30% of their time seeking information.”

This statement now refers to ‘users of information systems’ and not specifically the professional knowledge workers cited in the 2003 report.

2011

Let me move on to **Managed Print and Document Services for Controlling Today's and Tomorrow's Information Costs** published by IDC in 2011

“IDC surveys find that the time spent searching for information averages 8.8 hours per week”

This brings us much closer an hour a day than 2.5 hours a day. The benefit of improvements in IDC survey methodology and analysis.

Interim analysis

In quoting extensively from IDC I am not questioning their commitment to highlighting the high cost of finding information. This has been exemplary over the last two decades. I worked for IDC for four years and I am well aware of the care the company takes with its research. I just want to highlight that the estimate presented in the 2001 paper and extensively quoted ever since does a disservice to IDC in not representing the progress the company has made in researching and understanding the time/cost issues.

At this point I should also mention the McKinsey Global Institute report **The Social Economy – Unlocking Value and Productivity Through Social Technologies** published in 2012.

<https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-social-economy>

On p47 is a chart indicating the percentage of time taken by ‘Interaction Workers’ on a range of tasks. The chart cites the sources as being a combination of IDC and McKinsey analysis but does not identify which is IDC data and which is McKinsey analysis. No details are given as to how McKinsey developed the analysis presented in the chart. There is a figure of 19% in the chart for ‘Searching and gathering information’ and this is a wider scope than previous IDC research. The 19% figure comes down to just over an hour a day in a 35 hour working week. This is significantly less than the 2001 figure but of course over the period from 2001 to 2012 IDC revised its methodology.

2012 and task-based search

This year arguably marked the time when research into interactive information retrieval started to consider task-based search and time spent searching. A good place to start in understanding this development and its implications can be found in the paper **How is a Search System used in Search Task Completion** by Professor Elaine Toms (University of Sheffield) and Lori McCay-Peet (Dalhousie University).

<http://jis.sagepub.com/content/39/1/15>

The paper provides a very good review of previous work on search task completion. One of the papers on this topic comes from Google

<https://static.googleusercontent.com/media/research.google.com/en//archive/dmease-sigir09-full.pdf>

This research project was focused on the time taken to undertake a search task on the web. One of the conclusions is

“We confirmed that time until task completion has a negative correlation with user satisfaction on all levels. This general relationship has been observed in other studies, and our contribution has been to add more evidence in support of this”

Another major contribution was made in 2012 by Professor Pia Borlund (now at the University of Oslo) and her colleagues in a paper entitled **What does Time Spent on Searching Indicate?**

<https://dl.acm.org/doi/10.1145/2362724.2362756>

This paper reviews the ‘value’ of considering the time spent searching and includes a very valuable study of the information seeking approaches of engineers. The study used a work-task journal approach in which the engineers recorded their tasks during the working day. The most important outcome of this research was

“Out of the work task journal data, it seems that for profession-oriented work tasks of engineers’ work duty (i.e., identifying a suitable solution to given requirements or designing a new application) the expectations to the search engine differ from work tasks that were of administrative nature (i.e., time or travel management). The qualitative content analysis of work-task journal study material pointed on the following work task scenarios: (1) ordinary and (2) unordinary administrative tasks; everyday professional tasks as (3) high-quality tasks, (4) “just-to-get-done” tasks and (5) regular teamwork; and unordinary professional tasks as (6) unique tasks and (7) inventive teamwork.”

This differentiation in tasks is very important because it shows that using a generic ‘knowledge worker’ description is almost certainly misleading. The paper also notes

“The engineers, who performed these tasks.... were looking for details on areas where they already possessed a considerable amount of knowledge. This is likely to mean that they quickly want to get to the details they distinguish as relevant, and an optimal search does not require much time.”

This outcome is very important to take note of. When employees undertake an enterprise search they may well expect to see relevant items in the first page of results but will use these only as a reinforcement that the query is valid. They will almost certainly have the documents and so will not click on them even though the ranking algorithm deems them to be relevant. This may well result in click logs misrepresenting query satisfaction.

2014 and developments in survey methodology

In 2014 Karen Church and her colleagues published a paper on **A large-scale study of daily information needs captured in situ.**

<https://dl.acm.org/doi/10.1145/2552193>

Although this research was focused on web search it is among the first to use a mixed methods approach as a cross-check on a wide range of data inputs. The abstract to the paper is a very good summary

“The goal of this work is to provide a fundamental understanding of the daily information needs of people through a large-scale, in-depth, quantitative investigation. To this end, we have conducted one of the most comprehensive studies of information needs to date, spanning a 3-month period and involving more than 100 users. The study employed a contextual experience sampling method, a snippet-based diary technique using SMS technology, and an online Web diary to gather in situ insights into the types of needs that occur from day to day, how those needs are addressed, and how contextual, technological, and demographic factors impact on those needs. Our results not only complement earlier studies but also provide a new understanding of the intricacies of people’s daily information needs.”

A major development in survey methodology was pioneered between 2015 and 2017 in Finland by Professor Jarvelin at the University of Tampere and Miamaria Saastamoinen, one of his PhD students. In a set of three related papers they report on the use of data logging software to capture keystrokes in order to understand in great detail which applications are being used during the working day (including search) and the time spent on doing so. The level of detail and insight on the three papers is such that any summary by me will not do justice to them.

Queries in authentic work tasks – the effects of task type and complexity

<http://dx.doi.org/10.1108/JD-09-2015-0119>

Search task features in work tasks of varying types and complexity

<https://asistdl.onlinelibrary.wiley.com/doi/abs/10.1002/asi.23766>

Relationships between work task types, complexity and dwell time

<https://journals.sagepub.com/doi/abs/10.1177/0165551516687726>

The authors take a slightly different view of the work categories to that developed by Pia Borlund and devote a considerable amount of research to determining the balance of time and effort spent on a range of work tasks. Indications of time spent are in the third of the three papers listed above but all three need to be read together to get a true sense of implications of the research.

Although the authors do not describe the data logging technique as [computational ethnography](#) this is the survey methodology that is now becoming widely used in monitoring desk-top use of applications. (It is also referred to as digital ethnography). A good example is a study on how clinical staff use electronic health records

<https://pubmed.ncbi.nlm.nih.gov/31931523/>

Another good example is a study of social documents in enterprise collaboration platforms

<https://scholarspace.manoa.hawaii.edu/handle/10125/64402>

The point I want to make with these examples is that computational ethnography has to potential to provide definitive information on the time spent searching. The challenge lies in the ethical considerations of using data logging software. Moreover data logging only gives part of the story and needs to be supported by qualitative survey work.

2018 and search satisfaction

One of the benchmark projects in understanding enterprise search was undertaken by Paul H Cleverley and Simon Burnett at Robert Gordon University. The project involved the analysis of over 1000 critical comments about the extent to which an enterprise search application failed to meet their expectations.

<https://paulhcleverley.com/2019/01/02/enterprise-search-satisfaction/>

None of these critical comments related to the time taken to undertake a search

2019 and professional search

Several of the papers mentioned above seek to categorise information tasks. Over the last few years there has been a substantial increase in interest in professional search. This is the mode of search used by (for example) research chemists, lawyers, recruitment agents and patent searchers. The [First International Workshop on Professional Search](#) [download] took place in 2018. Recall is of the greatest importance and so professional searchers make use of complex Boolean queries and push the functionality of search applications to their limits. The searches they perform may take a considerable amount of time in the query preparation and testing, execution and then analysis. In some organisations these searches may well represent significant search usage where the time taken to undertake a search is largely irrelevant.

<https://arxiv.org/abs/1905.04577>

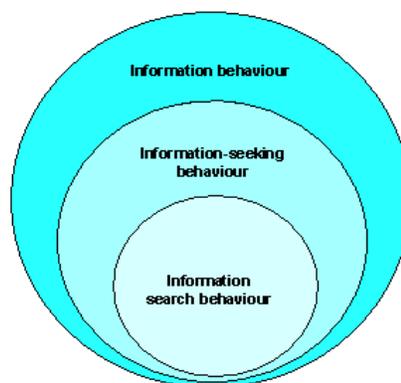
Seeking, searching and finding

The scenario presented by many search vendors is of a solitary employee seeking business-critical information and having to depend on a search application to meet their information needs. Given the range of potential options in an organisation this is not a realistic scenario.

Using a search application is just one way to seek out information. When we realise that we do not seem to have all the information we need to make a decision or undertake a task we now have a wide range of options that do not involve the use of a stand-alone search application

- Reading through documents we have stored on our personal or team files
- Using the information structure of an enterprise application (HR, ERP, e-Learning etc)
- Looking through information pushed through a personal profiling application
- Sending an email to one or more people we know
- Taking to a colleague or an acknowledged expert
- Posting a request on a social media channel
- Browsing through an intranet
- Checking through a department or team wiki
- Asking for assistance at the next team meeting
- Searching on the web

In 1999 [Professor Tom Wilson](#) , also working at the Information School in Sheffield, developed a very useful schematic for the positioning of information behaviour, seeking and searching.



This positions information search behaviour, the process of using a search application as just one element of information-seeking behaviour, and that in turn reflects organizational information behaviours. The definitive analysis of information behaviours in organisations is '[The Inquiring Organisation](#)' by Professor Chun Wei Choo, published in 2016. The sub-title of the book is 'How Organisations Acquire Knowledge and Seek Information'.

The act of searching must be put into this wider context so that we not only know how employees search but why they chose search as their option and what they then do with the information they found.

One of the earliest studies of human-computer interaction in responding to queries was carried out in 1967 by Robert S. Taylor, working as the Director, Center for Information Sciences, Lehigh University, and it remains valid today in the context of both enterprise search and digital assistants. In his report [Question Negotiation and Information Seeking in Libraries](#) [Download] he proposed a taxonomy of eight classes of information use which might well apply to enterprise search situations.

Understanding the context – information is used to develop a context or make sense of a situation

Understanding the problem– information is used to develop a better comprehension of a problem

Instrumental use – information about how to undertake a task

Factual use – information to determine the accepted truth about a phenomenon or truth

Confirmational use – information used to verify information already discovered or known

Projective use – information used to predict what is likely to happen in the future

Motivational use – information to initiate or sustain personal involvement

Personal use – information to develop relationships or to enhance status, reputation or personal fulfillment.

In effect these are different use cases, and it is arguably not a taxonomy. The categories are not mutually exclusive, and information gained from one of these cases may be used to address other needs. They do indicate that the reasons why employees use a search application are very diverse. An important implication of these use cases is that the assessment of what is relevant content will almost certainly be different in each case.

If you want to get a measure of the complexity of information seeking there is no better place to start than [Looking for Information](#) by Donald O. Case and Lisa M. Given. It runs to over 500 pages and lists 1600 research papers in the bibliography. If you are involved in any way with the management of search this book is (in my opinion) essential reading Reducing everything down to reducing the time taken to undertake a search is completely unhelpful. The research for that book was completed in early 2015.

Conclusions

My conclusions from this collection of research (and much has been omitted!) are

1. Time spent searching is a meaningless metric without being attributed to a group of users undertaking similar tasks within a similar context and using a replicable methodology.
2. The notion that employees take 2.5 hours a day to search for information is based on a complete misinterpretation of work undertaken by IDC in 2001 in which the authors use assumptions about time spent searching to illustrate the potential cost of not finding information.
3. Over the years IDC has worked on its methodology and the outcomes are that the time spent searching is substantially less than estimated in 2001. IDC has just completed further research

in this area but at present IDC Survey: [AI-Enabled Enterprise Search 2019 Trends](#) is only available to IDC subscribers.

4. Even a technique as quantitatively reliable as computational ethnography does not provide the full story and the data collected, as is the case with all the survey methodologies, has to be carefully assessed in the context of the information behaviour, information seeking and information searching context of each organisation.
5. In particular it needs to be recognized that employees are faced with information arriving on their desktops from a wide range of enterprise search applications, not least email, social networks and enterprise resource planning applications.
6. The point is well made in the paper by Professor Borlund that enterprise search users are informed users. They already have a query vocabulary and expertise in the topic and will already have accumulated a collection of information. Search fills in the gaps and meets some specific needs but the notion that employees are totally bereft of the information they need to achieve their business and personal objectives is completely spurious.
7. I would have thought that search vendors would themselves have been able to provide very good estimates of the time spent searching from their customers, and be able to use that to make well-grounded estimates of the time that the employees of customers saved in using their search applications.
8. In the final analysis it is not just how long it takes to complete a search but whether this is [Time Well Spent](#).