



how much information?

what kind of question?

concepts of information

Feb 1, 2010



overview

thursday's class assignment

Assignment:

- Popular articles sometimes discuss the idea of the Internet as a "public sphere." Find such a discussion (hint: put 'Internet AND "public sphere"' into Google News, LexisNexis, Proquest news sources, or some such) and explore how and why it is using this term. Find another article for a general audience that talks about the public sphere in a contemporary context but not about the Internet and consider the extent to which the concept of public sphere in the two cases is or is not distinct.

Reading:

- Papacharissi, Zizi. 2002. "[The Virtual Public Sphere: The Internet as a Public Sphere](#)," *New Media & Society* 4(1): 9-27
- Poster, Mark. 1995. "[The Net as a Public Sphere](#)," *Wired* 3.11 (November)



caveat

I had a concern -- probably unwarranted -- that the "public sphere" assignment might be a little hard to focus in on, particularly given the fuzziness of a lot the discussions of this term. Here are a couple of additional questions that might help to center in on one aspect of the issue -- but there's no need to address any of these if you are already taking this in some other direction.

1. The notion of the public sphere is sometimes applied to the internet as a whole and sometimes to various sub-discourses or (putative) virtual communities (e.g., Slashdot, the open source movement, etc.) Does one or the other of these applications of the concept seem more appropriate?
2. What do you think of Poster's argument that the protean nature of online identities makes the net fundamentally different from the "classical" public sphere?
3. Of the various criteria that people invoke to define the public sphere (autonomy/independence, equality, inclusiveness/accessibility, rationality of discussion, etc.), do one or more strike you as particularly relevant/irrelevant to the application of the notion to the internet?

In addition to the Papacharissi, you might find useful the discussion in the following, if necessary:

Allison Cavanagh, *Sociology in the Age of the Internet*, text pp 59 ff. (pp. 70 ff of ebrary version). Available online at ebrary (via UCB library) at <http://site.ebrary.com/lib/berkeley/docDetail.action?docID=10197048>

Computer-Mediated Communication and The Public Sphere: A Critical Analysis
Lincoln Dahlberg, <http://jcmc.indiana.edu/vol7/issue1/dahlberg.html>



how much information?

what kind of question?

what light does it throw on concepts of
information?



overview 2

overloads and explosions

looking back

familiar complaints?

familiar tactics?

counting information

18th, 19th, 20th century



overload & explosion

THE CHRISTMAS DAY TERROR ATTACK



Dec. 30, 2009

Bomb Plot Exposed Lack of Intel "Urgency"

Failure to Pinpoint Credible Intel, and Information Overload Hindered Ability to Thwart Plot

By Armen Keteyian



overload & explosion

THE CHRISTMAS DAY TERROR ATTACK



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info-solutions

LETTERS; The Airport Mind Scan, and the Terror Algorithm

Published: January 6, 2010

To the Editor:

A representative from an American intelligence agency was quoted as saying the reason Umar Farouk Abdulmutallab, the suspect in the attempted airline bombing, was not detected as a threat was that the volume of information streaming into the various intelligence agencies is so great that there will always be a risk that connections will not be made.

This statement would have been reasonable 30 years ago, but in light of the computer power now available, it seems incomprehensible that an algorithm could not be constructed that would minimize the human factor from the equation.

Given the numerous facts that were known, if all of this information were shared (an issue that has not yet been clarified), it seems inescapable that a warning flag would have appeared, and at the very least, his visa would have been canceled.

Nora Connell

Freeland, Md., Dec. 31, 2009



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droning on

Military Is Awash in Data From Drones

By CHRISTOPHER DREW
Published: January 10, 2010

HAMPTON, Va. — As the military rushes to place more spy drones over Afghanistan, the remote-controlled planes are producing so much video intelligence that analysts are finding it more and more difficult to keep up.



over to us

Sean:

We strive to understand the effects of all this information traveling around, how we deal with **information overload**, how best to store and display it and ultimately how the increased speed in which information is transmitted affects our society.

Michael:

This increasing **accumulation of information** has outpaced natural selection's ability to improve the information processing capacity of the human brain. ¶We have, by necessity, invented technology to help us deal with and organize the constantly growing sources of information that our society produces.



HMI?
How Much Information?



They Yawn



in the face of History

Today's eager Americans have traded in the placid past for a livelier, streamlined present. They live their history while it's news.

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Liberty

EAGER MILLIONS

the Magazine of the Week



new & powerful & old



"confusing and harmful abundance of books"
Conrad Gesner, *Bibliotheca Universalis, sive Catalogus Omnium Scriptorum ...*, in *Tribus Linguis*, 1545

confusing attitudes

"Where are the 700,000 books from the library of Ptolemaios Philadelphos Johannes Zonaras ... relates how, in Byzantium under Zeno, 120,000 books were consumed in a great conflagration."



presentism?

"The real, central theme of history is not what happened, but what people felt about it when it was happening"

George M Young,
*Victorian England:
Portrait of an Age,*
1960

documents
books
libraries
counting information?

Ann Blair, "Reading Strategies for Coping with Information Overload," 2003



presentism?

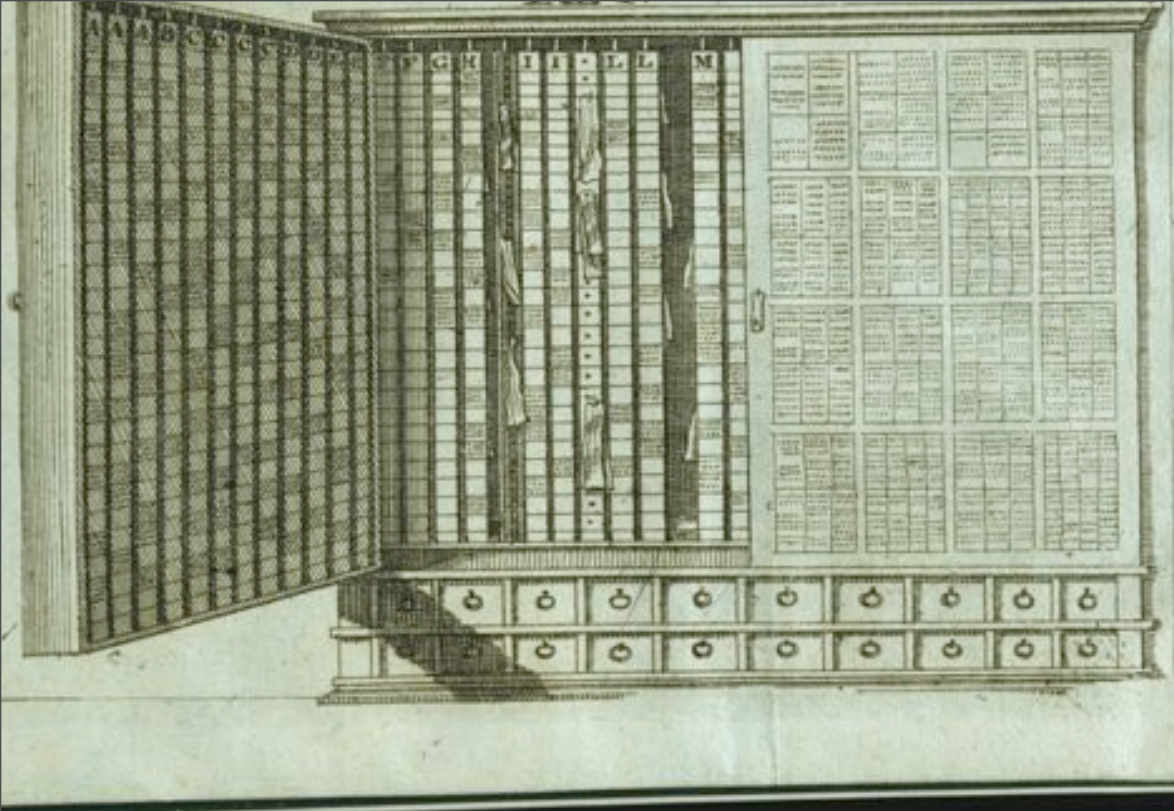
"Whenever the people are well-informed, they can be trusted with their own government"

Jefferson to
Richard Price, 1789

" '[A] man of knowledge increaseth strength' ...
'Knowledge is the wing wherewith we fly to heaven' ... 'knowledge itself is power' ...
from the printing press onward, Western society has been caught up in an information ... revolution ... Bouncing words of satellites ... storing and manipulating undreamed of quantities of information in the twinkling of an eye"

Richard D. Brown, *Knowledge is Power: The Diffusion of Information in Early America, 1700-1865*, OUP 1991

Richard D. Brown, *The Strength of the People: The Idea of an Informed Citizenry in America, 1650-1870*, UNC Press, 1996



Vincentius Placcius
1642-1699
scrinium

familiar tactics?

"selecting, sorting, and storing ...
"new genres ... dictionary, ... encyclopedic
compilation ... alphabetical index...
"reading in parts" ... consulted rather than read
"note taking ...
"Naudé's summaries ... abbreviations
"Isaac Newton .. unique in his practice
of dog-earing
"Gesner, cutting up his letters for reference."

Ann Blair, "Reading Strategies for Coping with
Information Overload ca 1550-1700," 2003



perennial index



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Meanwhile: 'Ulysses' without guilt - Opinion - International Herald Tribune

Stacy Schiff

Published: Wednesday, February 14, 2007

There are two ways to approach our cultural crossroads. You can either wring your hands and lament — as an eloquent school librarian did recently in *The Washington Post* — that literacy today has less to do with Wordsworth or Faulkner and more to do with “how we find our way through the digital forest of information overload.” Or you can be a sport about it, slip your earbuds back in and pick up a copy of Professor Pierre Bayard’s best-selling “How to Talk About Books You Haven’t Read.”



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stepping back



"It will soon be the employment of a lifetime merely to learn [books'] names. Many a man of passable information at the present day reads scarcely anything but reviews, and before long, a man of erudition will be little better than a mere walking catalogue."

Washington Irving, 1820



further back



"The most accomplished way of using books at present is twofold. Either, first, to serve them as men do Lords, learn their titles exactly and then brag of their acquaintance :
—or, secondly, which is indeed the choicer, the profounder, and politer method, to get a thorough insight into the Index, by which the whole book is governed and turned, like fishes, by the tail. ... Thus men catch knowledge by throwing their wit on the posteriors of a book, as boys do sparrows by flinging salt upon the tail."

Swift, "Tale of a Tub," 1704



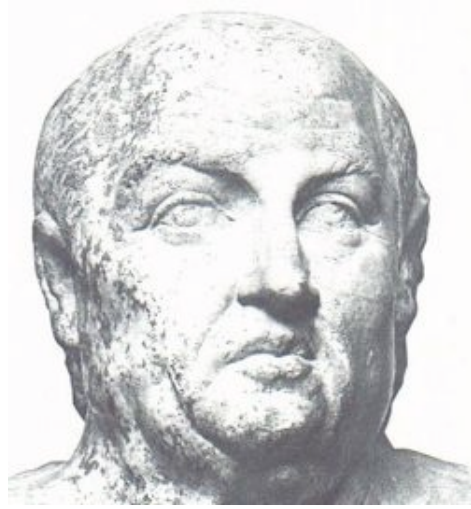
further yet

"Even for studies, where expenditure is most honorable, [developing libraries] is justifiable only so long as it is kept within bounds. What is the use of having countless books, and libraries whose mere titles their owners can scarcely read through in a whole life time? The mass of them does not instruct but rather burdens the student; and it is much better to surrender yourself to a few authors than to wander through many. Forty thousand books were burned at Alexandria; let someone else praise this library ... as did Titus Livius, who says that it was the most distinguished achievement of the good taste and solicitude of kings. There was no "good taste" or "solicitude" about it, but only learned luxury--no, not even learned, since they had collected the books, not for the sake of learning, but to make a show, just as many who lack even a child's knowledge of letters use books, not as the tools of learning, but as decoration for the dining room."



further yet

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Seneca, 4 bc - 65 ad

further yet

De Tranquillitate Animi

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summing up?



"Ars longa, vita brevis,
occasio praeceps,
experimentum periculosum,
iudicium difficile."

Hippocrates, 460 bc



iudicium difficile

"We have reason to fear that the multitude of books which grows every day in a prodigious fashion will make the following centuries fall into a state as barbarous as that of the centuries that followed the fall of the Roman Empire. **Unless we try to prevent this danger by separating those books which we must throw out or leave in oblivion from those which one should save and within the latter between what is *useful* and what is not.**"

Adrien Baillet, *Jugements des sçavans*



tempering alexandrian fantasies

iudicium difficile



Chetham Library
1653

"These Libraries in a few years, will be full and compleat, being furnished, not only with all the **valuable and usefull Old Books** in any Art of Science, but also with all the valuable New Books, so soon as every they are heard of or seen in the World"

An Overture for Founding and Maintaining of Bibliothecks in Every Paroch Throughout this Kingdom, James Kirkwood, 1699



looking for character

iudicium difficile



Tobias Smollett
1721-1777

"the British Museum ... adding to each at the public expense, those articles that are wanting by purchasing all the **books of character** that are not to be found already in the collection. They might be classed in centuries, according to the dates of their publication, and catalogues printed of them and the manuscripts a complete apparatus of a course of mathematics, mechanics, and experimental philosophy."

Tobias Smollett, *Humphrey Clinker*, 1771



useful information

David Hume

"When we run over our libraries persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance, let us ask

Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it to the flames: for it can contain nothing but sophistry and illusion."--David Hume,

Enquiries, 1777

Caliph Omar



iudicium difficile

Google books
judgement in suspension?



past and present

how much information?



0

[127,000 books, 1473-1700]



0

[1680-1800]



4

[150,000 books, 1700-1800]

1788, 1789, 1795, 1796



not forgetting

Books 1 - 10 of 21 on "How much information", |

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rounding down

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 [Memoirs of the Life, Studies and Writings of Ge. Home, Lord Bishop of Norwich - Page 76](#)
William Jones - 1788
... how much information he derived from this excellent writer; ...
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 [A collection of ancient records, relating to the borough of Huntingdon, with ... - Page 3](#)
Edward Griffin - 1727
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not forgetting



Semi-algebraic function rings and reflectors of partially ordered rings - Page 217

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19 Reduced /—rings In section 17 we discussed the question of how much information is required to determine a

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1712

Niels Schwartz James J. Madden

Semi-algebraic Function Rings and Reflectors of Partially Ordered Rings



looking for numbers?

"How many mental pleasures, and how much information should we be deprived of if there was no night?"

S Sturm, Reflections, Edinburgh, 1788.

"... how much information he derived from this excellent writer;"

Jones, Memoirs of...George Horne, London, 1795

"How much ingenuity might be displayed and how much information communicated by a professor."

Clarke, Letters to a Student, Boston, 1796



counting?

Pinto, 1774: The best book is not that,
perhaps, which contains the greatest
quantity of information.

James, 1790-98: Whatever difference may be
found between the parts of this work of mine
already published .. as to the quantity of
information ...

Knox, 1790:[Salamasius's works] furnish a
great variety and quantity of information.



comparing

"The Register will be found to contain double
the quantity of information ever before
inserted in it."

Longworth, Almanac, 1799

"Johnson's *Journey to the Western Islands* ..
does not admit of abridgement, because every
sentence compresses such a quantity of
information."

Historical Magazine, 1799



centuries of print



"The present age... may be styled, with great propriety, the Age of Authors; for, perhaps, there was never a time when men of all degrees of ability, of every kind of education, of every profession and employment were posting with ardour so general to the press."

Samuel Johnson, *The Adventurer*, 1753

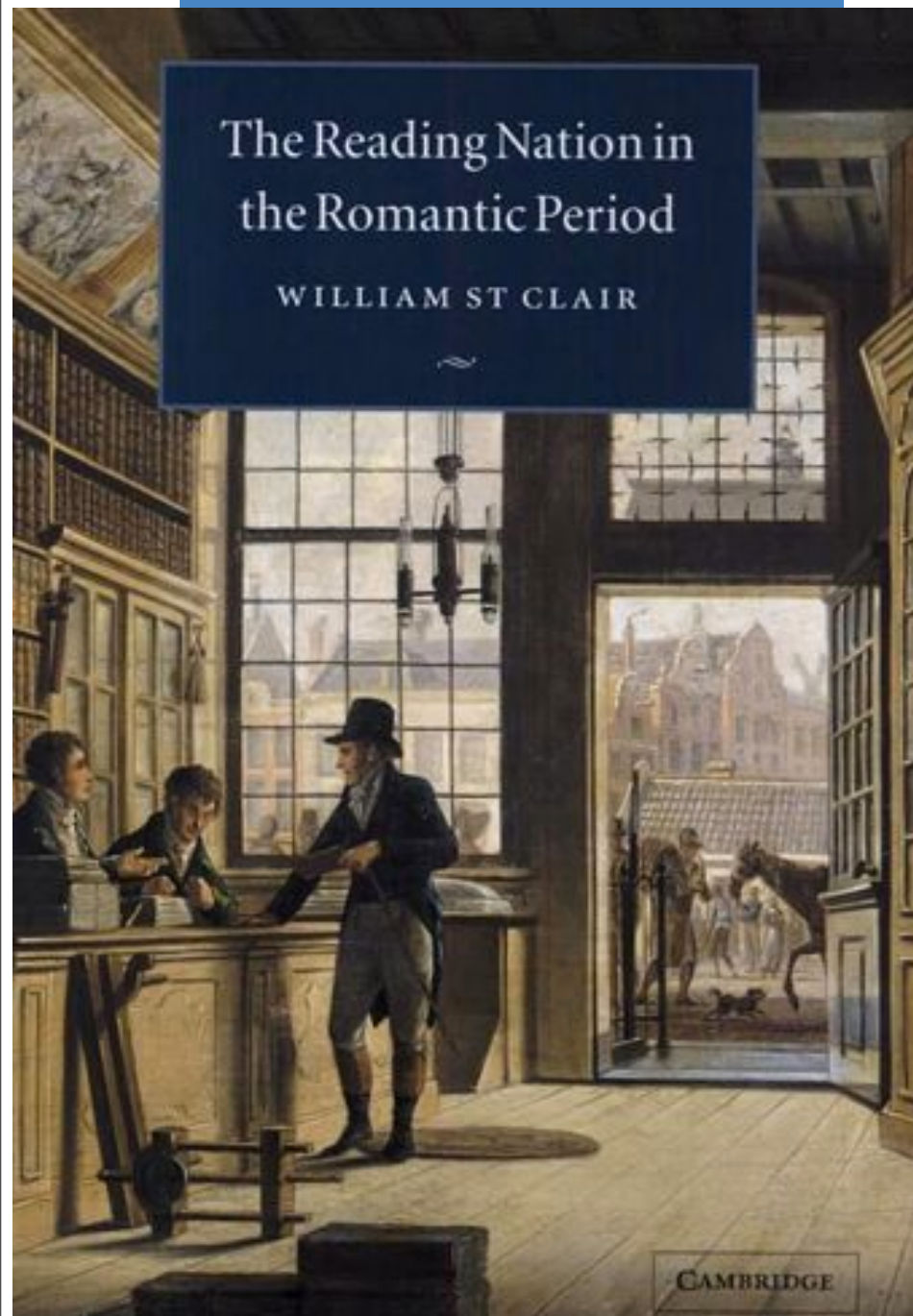


trend lines?

Number of titles printed in England:

1630s	600
1640s	1,600
1650s	1,200
1660s	800
1670s	1,000
1680s	1,500
1690s	1,400
1700-50	500
1750-89	600
1790-1800	800
1800-1810	800
By 1827	1,000
("rising fast")	

William St. Clair, *The Reading Nation*, 2004





more selling

Times (London)

1784 -1900: **43**

7 ads (dictionaries, grammars, atlases);

25 books (reviews), newspapers, reports;

7 education;

1 telegraph;

1 trade statistics,



weighing information

[on newspaper tax]"The Times weighs generally more than four ounces ... this measure would [for taxing newspapers] would affect The Times, while the other morning papers would be allowed to go freer ... The Times, because it gave too much information to the country, ... would be obliged to pay more."

Times, 1855



political debate

[the need for]: calm investigation ... For ..
it is impossible to have too much information
as to the social and economical relations of
that agricultural population."

The Times, 1880

"The public, however, cannot have too much
information at a crisis like this .. useful to
give some account of the further Egyptian papers
just issued."

The Times, 1882



political debate

famine to glut

"If the government had erred at all, it has
been in giving too much information."

The Times, 1885



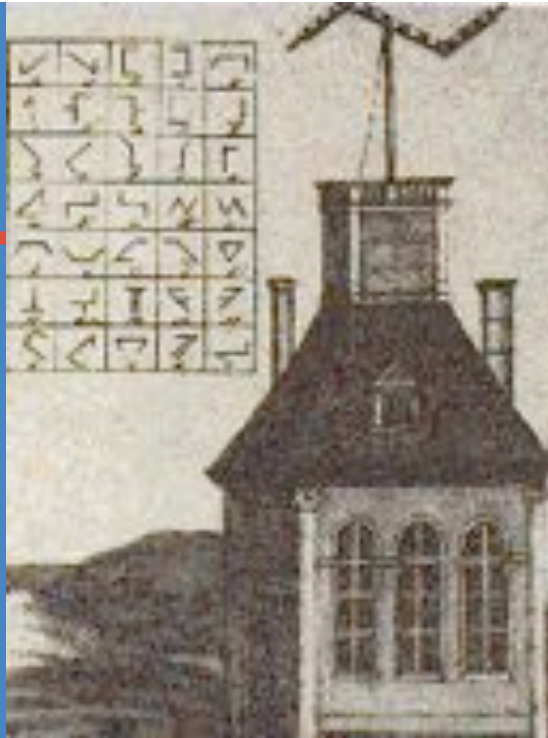
really too much information

[re commerce and transatlantic cable]: "Every new ground of information, every earlier access to information .. is an addition to the trial and work of commercial life. Time was when a merchant in Liverpool or Glasgow received his business letters in a morning... then came the electric telegraph, which pursued him even into his evening circle ... evidence of overtaxed heads .. men have already more material of calculation than they can use A man may easily have **too much information** -- more than he can manage--one part of it modifying and qualifying another, till he does not know where he stands. But though every fresh addition, every earlier access to data is a trial of feeble, it constitutes the triumph of strong heads. They exult in the largeness, the multiplicity, the intricacy of their field of intelligence."

Times, 1866



transmitting information



"these machines have generally been established for the purpose of transmitting information during war"

Charles Babbage,
On the Economy of Machinery and Manufactures, 1832





choking on information

[London school board investigation into exams]: many answers show that the candidates do not understand the meaning of the phrases they use, and that too much information and too long words ... still choke children, or impair their mental digestion."

The Times, 1886



aristocracy of thought

"Intellectual culture consists, not chiefly, as many are apt to think, in accumulating information, though that is important, but in building up a force of thought which may be turned at will on any subjects, on which we are called to pass judgement.

William Channing, 1838

"It may well be questioned whether the invention of printing, while it democratized information, has not so levelled the ancient aristocracy of thought."

James Lowell, 1893
How Much 2010 41



20th century gloom



Process reproduction and the rotary press have made possible the indefinite multiplication of writing and pictures. Universal education and relatively high wages have created an enormous public who know how to read and can afford to buy reading and pictorial matter. A great industry has been called into existence in order to supply these commodities. ...The population of Western Europe has little more than doubled during the last century. But the amount of reading—and seeing—matter has increased, I should imagine, at least twenty and possibly fifty or even a hundred times

Aldous Huxley, 1934



academic angst

"There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less to remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial.

"Professionally our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose."

Vannevar Bush, "As We May Think," 1945



signs of hope?

"But there are signs of a change as new
and powerful instrumentalities come into
use."

Vannevar Bush, "As We May Think," 1945



print overruns



"Something has happened in the last hundred years to change the relation of the written word to daily life. Whether it is the records we have to keep in every business and profession or the ceaseless communicating at a distance which modern transport and industry require, the world's work is now unmanageable, unthinkable, without literature. ... A committee won't sit if its drivelings are not destined for print. Even an interoffice memo goes out in sixteen copies. [There is a] huge number of activities which (it would seem) exist only to bombard us with paper."



who's counting what?



chips and shoulders

Alvin Toffler,

"The Quantity of Culture," *Fortune*, 1960

"The United States suffers from an inferiority complex about its culture consumption ... I shall attempt to give a rough idea of the amount of culture consumption in this country."

Alvin Toffler, *The Culture Consumers*, 1961



producing anxiety

competitive counts

"The U.S. produces 35% of the worlds new printed information each year and 40% of the world's card and letter postal volume. About half of all postal mail in the United States is currently first class and about half is junk mail. If we assume 2 pages per piece of mail, digitized at 15 kilobytes per page, 2002 U.S. mail was about 6.23 petabytes per year. This represents an increase of about one-half of a petabyte over 1999 estimates."

How Much Information, 2003



huge explosion

"this huge explosion in news, statistical data, and information ... the historical picture of the knowledge explosion was first formulated by ... de Solla Price in 1963 ... *Little Science, Big Science*"
Daniel Bell, "The Social Framework of the Information Society," 1979

Year	# sci journal	# books, Johns Hopkins
mid 17c	2	
mid 18c	10	
1800	100	
1850	1000	
1900		100,000
1950	30-100,000	
1970		1,500,000



cranking it out

According to one estimate, more new information has been cranked out in the last three decades than in the previous five millennia. The total amount of printed knowledge doubles every eight years. ... The phrase "I read that somewhere, but I can't remember where" has become endemic. The result? Information anxiety, described as "the black hole between data and knowledge." The difference between the two: Data is the raw material, and is passive; information is active and, ideally at least, enlightening. As we thrash around in the over-abundance of the first, the second becomes ever more elusive.

Washington Post, 1989



calming down or 'amplifying the din'?

"Technological change is always a Faustian bargain....

"If I may take my own country as an example, here is what we are faced with: In America, there are 260,000 billboards; 11,520 newspapers; 11,556 periodicals; 27,000 video outlets for renting tapes; 362 million tv sets; and over 400 million radios. There are 40,000 new book titles published every year (300,000 world-wide) and every day in America 41 million photographs are taken, and just for the record, over 60 billion pieces of advertising junk mail come into our mail boxes every year. Everything from telegraphy and photography in the 19th century to the silicon chip in the twentieth has amplified the din of information, until matters have reached such proportions today that for the average person, information no longer has any relation to the solution of problems."

Neil Postman, "Informing Ourselves to Death, 1990



info-solutions

"All claims of this sort have their historical specificity, and one must always ask: who has to gain from assertions that information is chaotic, overwhelming, and out of control? The answer is usually found in the expert groups who offered solutions."

John Agar, *Government Machine*, 2003



who's counting?

toxic terabytes

"This year [2006], electronics manufacturers will produce more transistors ... than the world's farmers grow grains of rice ... four years from now, the world's information base will be doubling in size every 11 hours. ... kilobytes .. megabytes ... gigabytes ... terabyte .. petabyte .. exabyte ... zettabyte .. yottabyte"

"... when terabytes turn toxic ... no amount of disks will be enough to soak up the deluge"

"... taming the data beast ... data detox"



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How Much Information?



informationalism

"Data from a large variety of sources can be combined in an equally large variety of ways with other data, thereby increasing substantially the amount of information that can be produced.

... the expansion is a systemic ... intrinsic characteristic of the contemporary world ... closely associated with sophisticated storage and updating mechanisms ... mutual implication of information with the technologies by which it is ... mediated

"[an] ... institutionally orchestrated game for obtaining information that is fresh and relevant results in information becoming readily depreciated and obsolete ... self-propelling, runaway .. expansion and growth

Jannis Kallinikos, *The Consequences of Information: Institutional Implications of Technological Change*, 2006



getting our attention

"Is there in fact .. an "information explosion"? ...

How valid are these predictions of an impending flood? ...information doesn't have to be processed just because it is there ... We cannot save ourselves from drowning in information by installing faster ... devices ... The limits is not information but our capacity to attend to it."

Herbert Simon, *Administrative Behaviour*, 1997

"the late James Ten Broeke, Professor of Philosophy in McMaster University, was accustomed to set, "Why do we attend to the things to which we attend"

Innis, *Bias of Communication*



self-discipline

"In the light of the actual progress, there is no reason to revise our basic thesis: that electronic computers are general-purpose information-processing devices? ... Given the rate at which the technology of information processing is progressing, why won't there be an information explosion ... Specifically, information doesn't have to be processed just because it is there."

Herbert Simon, *Administrative Behavior*, 1987.

Viktor Mayer-Schönberger, *Delete*

The Virtue of Forgetting in the Digital Age, 2009



antecedents

"I thank God, *there are no free schools or printing*, and I hope we shall not have these hundred years; for *learning* has brought disobedience, and heresy, and sects into the world, and *printing* has divulged them, and libels against the best government. God keep us from both [learning and printing]!"

Governor William Berkeley, Virginia, 1671

[Book burnings
Charles II, 1683
James II, 1688
Boston, 1712
How Much 2010 57



looking back

an old debate

new solutions

new problems

