Plagiarism: A New Look At An Old Problem

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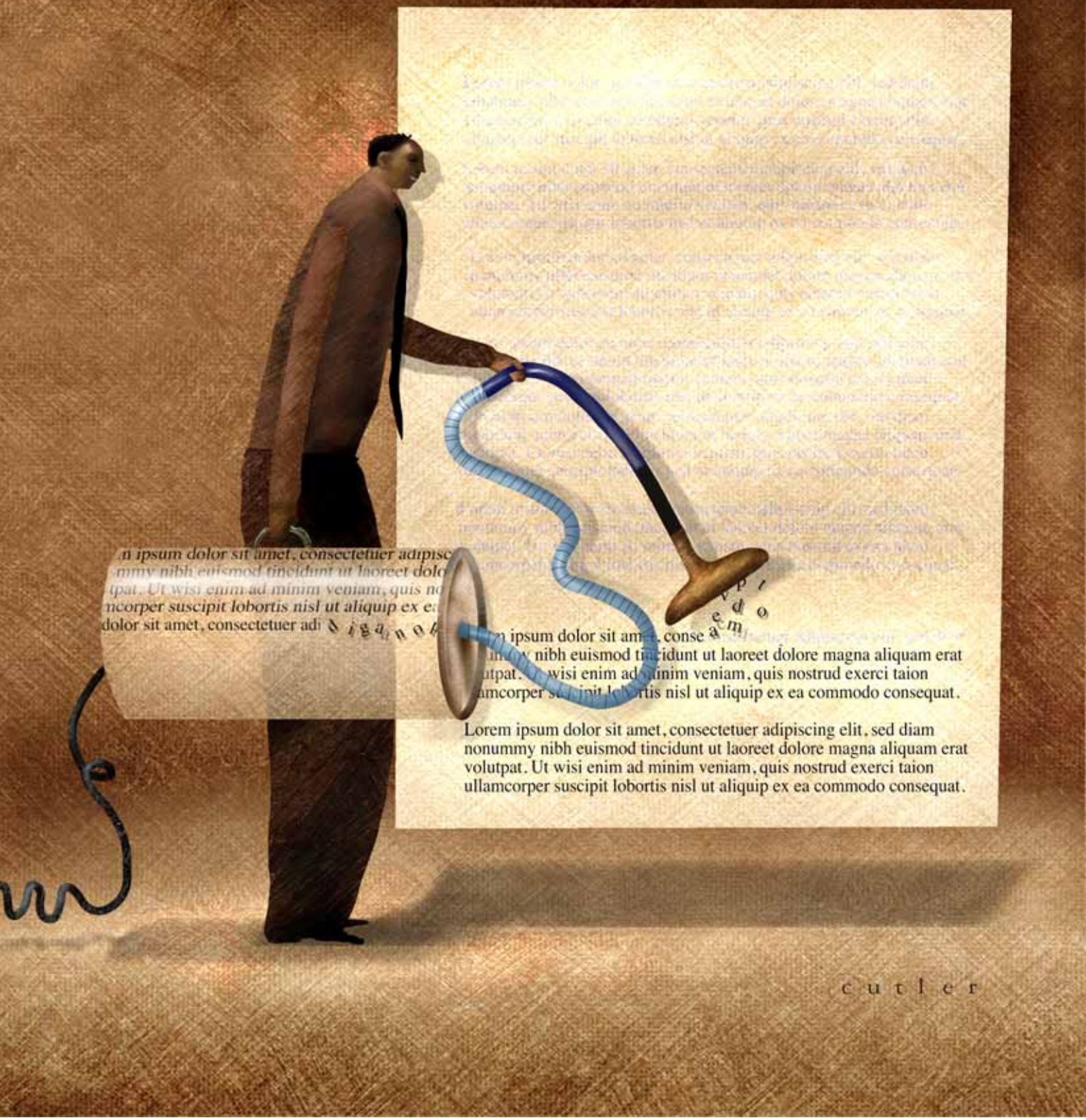
Turnitin and iThenticate - Founder



Profession prior to plagiarism

- Undergraduate: U.C. Berkeley, Rhetoric and Neurobiology
- Doctorate: U.C. Berkeley — Biophysics Multidisciplinary Graduate Group, Neurobiology
    - Dissertation: Theoretical and computational electro-neurophysiology - Spatiotemporal dynamics of the neocortical EEG (aka, the physiology of perception)

How did I get here?

- Concurrent research regarding technologies to extend traditional educational models
  - Created class websites (1994-2000)
  - Goals:
    - Expose undergraduates to peer review process
    - Allow students to share information in ways not possible without the Internet
  - Results published as a 1996 study in *Science*:
    - Acquisition of core course ideas was facilitated
    - Students acquired Internet skills unrelated to the class
    - Faculty interacted with the class website < 15 hrs/term

    - Unexpected observation: There were significant levels of digital plagiarism and collusion among the Berkeley students
    - 1996 prediction: Intellectual property theft (plagiarism) would become an enormous problem for educators and for Academia

Turnitin has thousands of institutional clients in >50 countries representing over 9,000,000 students and we receive >20,000 student papers per day

Hundreds of universities in the UK (JISC)

Cornell University
UCLA, UC San Diego, UC Davis, UC Santa Cruz, etc.
Georgetown University
Duke University
California Institute of Technology
Colgate University
Rice University
Boston University
California State University System
Georgia State University System
Michigan Tech
Houston Unified School District
The University of Maryland System
Rochester Institute of Technology
Rutgers University System
US Military Academy, West Point
Trinity College
Swarthmore College
The Citadel
The University of Western Ontario
Manakau Institute of Technology, New Zealand

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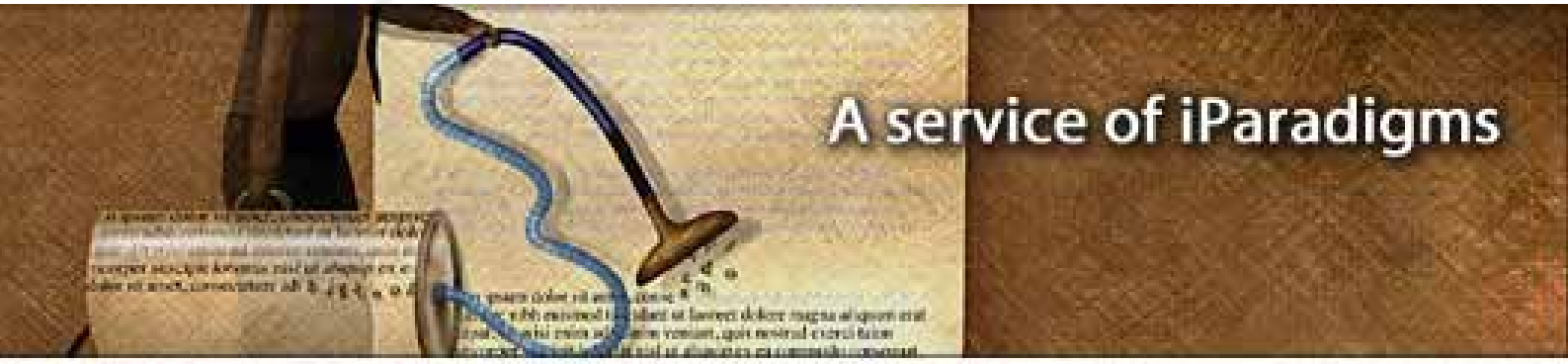


Aside

• We index the works from some of the largest aggregators (going back five years)

• Students are referencing (or not) information from the Internet in amounts 1000 times greater than information from the more traditional sources that we index

Unattributed use of another person's ideas seems to be a general problem in our society

• Many politicians and corporate leaders rarely write their own speeches, policy positions or books

• Some researchers routine take credit for work done with their grant money

• Some famous journalists have research teams write their articles

• Many legal opinions written by distinguished judges and justices are really written by their judicial clerks

• Plagiarism in academia is rampant (according to the largest study of plagiarism, more than 40% of students have admitted to plagiarizing from the Internet)

• We find that about 30% of the more than 20,000 papers we receive each day are less than original

Similarities between publishing and academia

• Both institutions consider plagiarism to be a capital crime

• Both institutions suffer sporadic plagiarism scandals brought to light mainly by chance

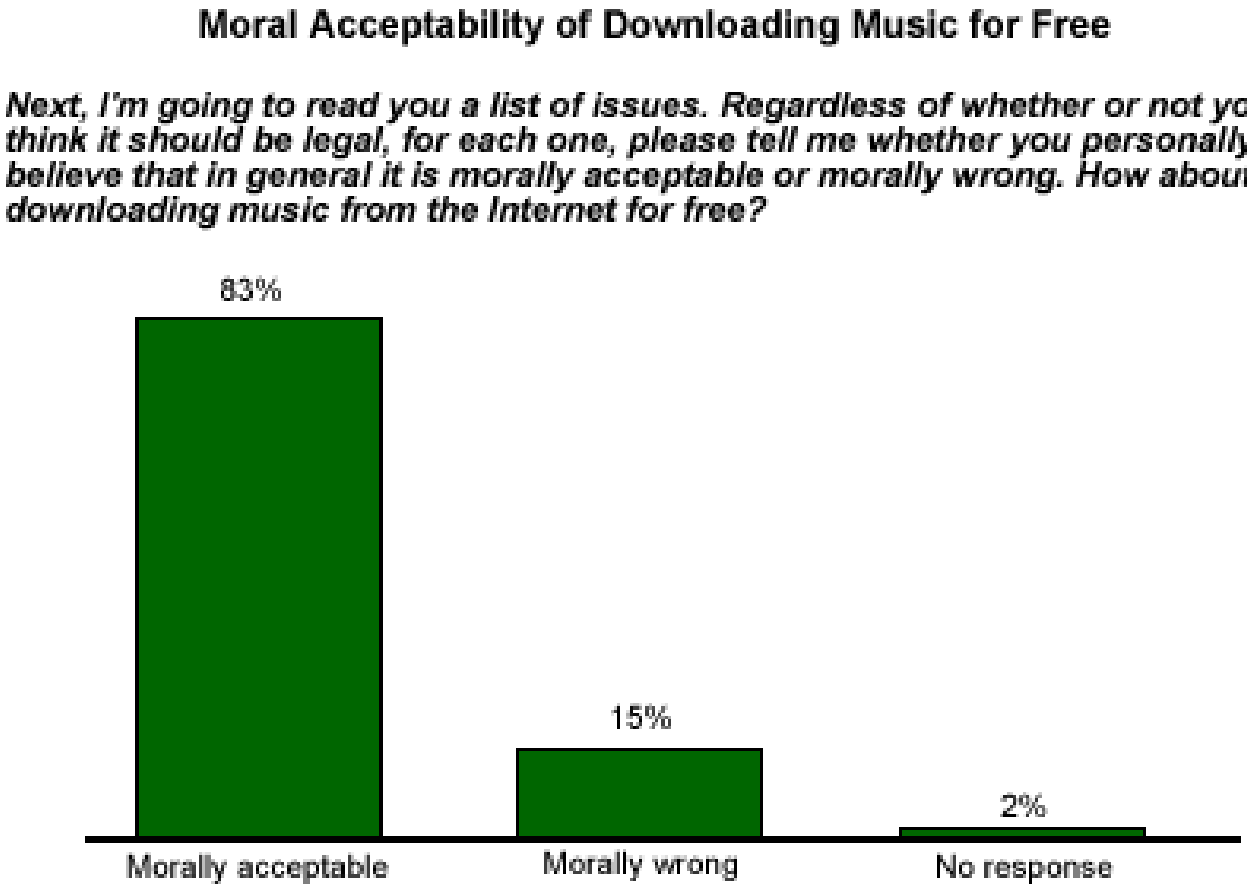
• Both institutions rely on a code of honor and integrity to deter plagiarism and fraud

• Both institutions typically react to plagiarism scandals by placing the offending party's head on a stick for others to see to further deter unethical activity

• In both cases, each institution is being reactive instead of proactive and their digital plagiarism problem continues… in spite of all efforts to deter

Plagiarism in the media and in academia is a digital problem

• Attitudes among students (your future authors and researchers) regarding **digital** intellectual property theft are enlightening. From a September 30, 2003 Gallup Poll:

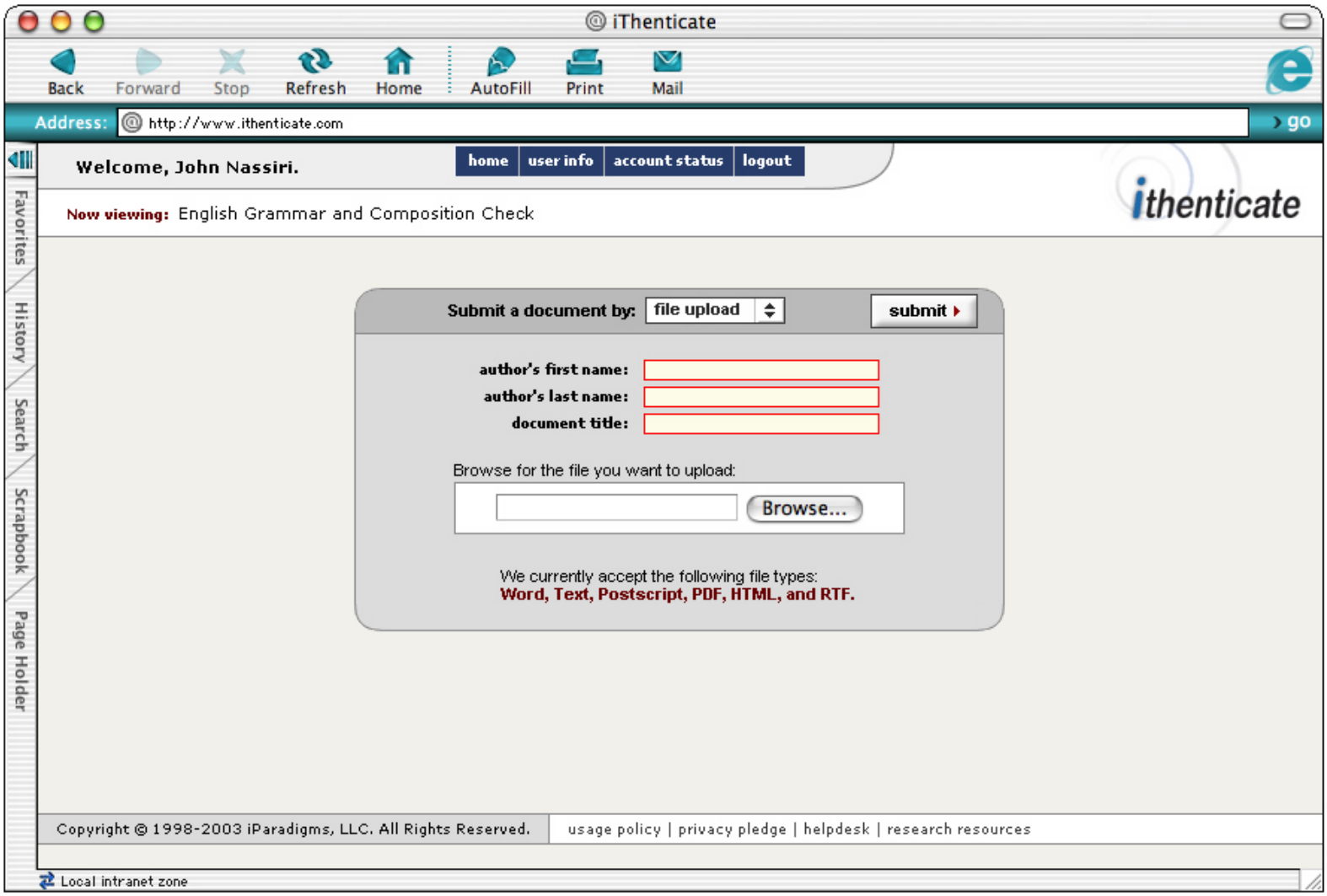


• Only a digital solution can address this digital problem

Publishers have some additional problems that academics grading papers may not have

- Potential for lawsuits from an increasingly litigious society
- Immediate detriment to reputation
- Loss of revenue from down-stream intellectual property theft
- Could involve award-winning journalists, Pulitzer Prize winning authors or university presidents (such as Richard Judd, the President of Central Connecticut State University)

Step One: The digital manuscript is submitted over the Internet and to our computers



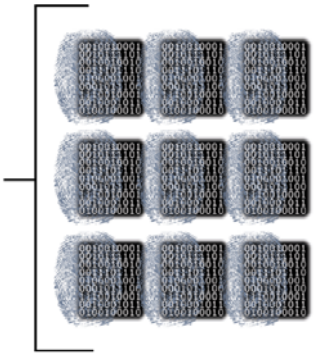
Finding a needle in a haystack

1. Manuscript or article submitted to iThenticate

2. Computer transforms manuscript into a digital fingerprint: a very long string of numbers

3

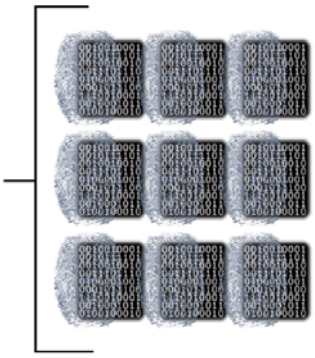
Copy of Internet



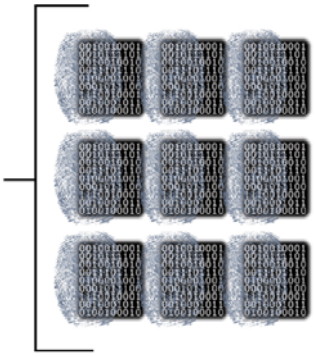
4

Extract matching documents

Electronic Books

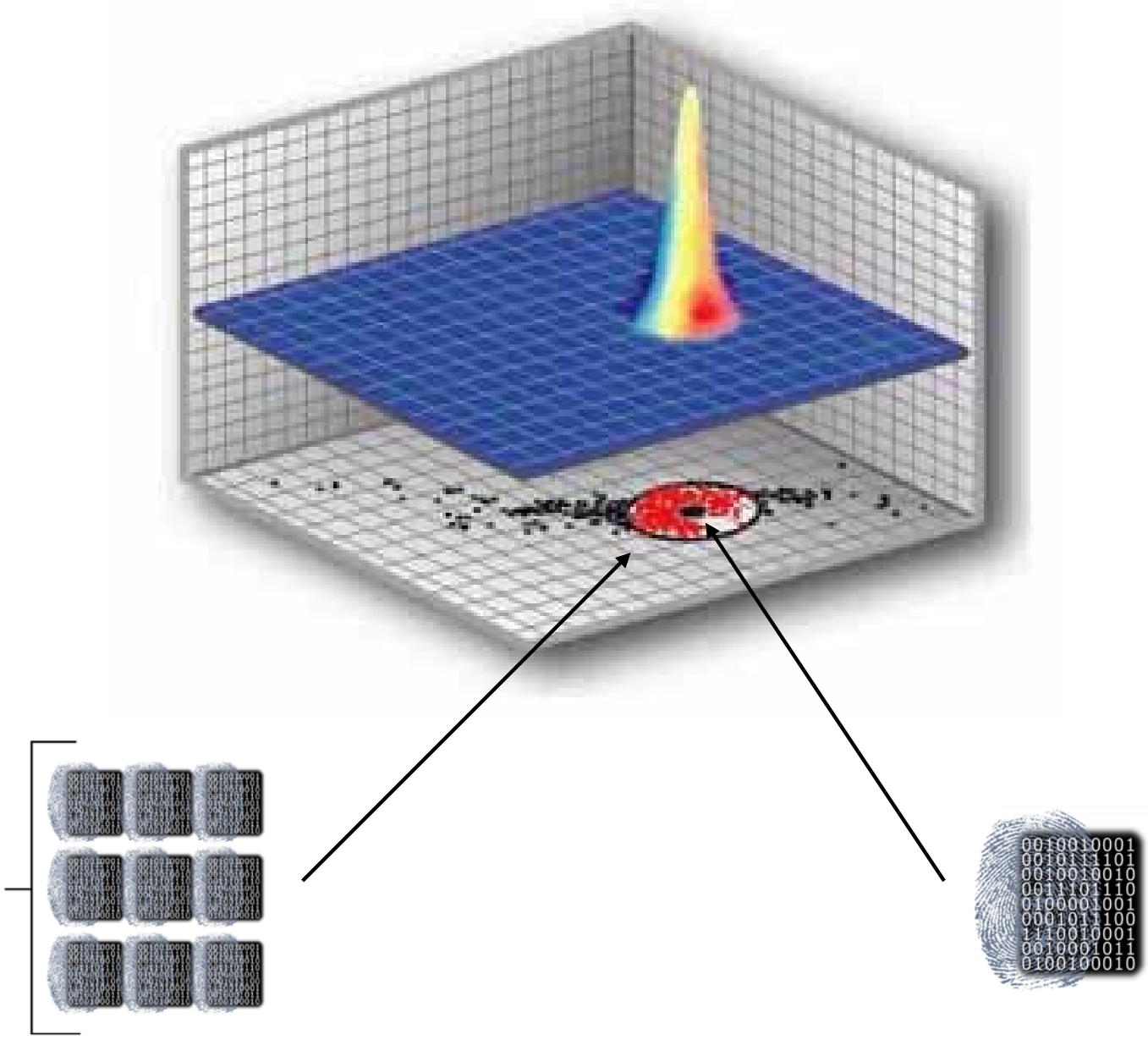


Journals / Periodicals



How can we compare a manuscript or article to BILLIONS of documents in any reasonable amount of time?

- We re-map the digital fingerprint of the manuscript or article into a high dimensional space and test for clustering



Generating the Originality Report

Entire process: < 10 seconds

Matching passages from 3+ billion Internet web pages: downloaded at a rate of 40 million pages/day

Matching passages from thousands of digital books

Matching passages from tens of millions of periodical articles

5

6

Compare matching passages to original manuscript or article

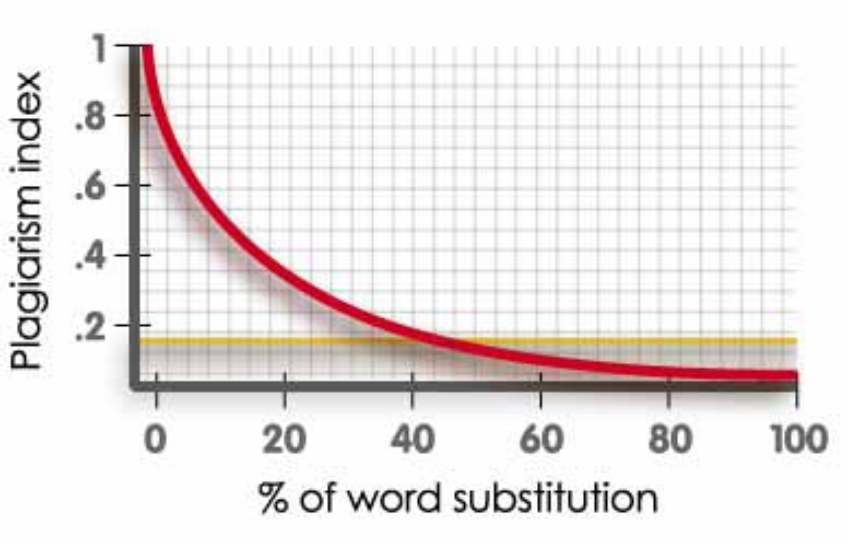
Detection of word substitution or alteration

MACBETH MANUSCRIPT FROM THE INTERNET (INTRO PARAGRAPH)

Macbeth is presented as a mature man of definitely established character, successful in certain fields of activity and enjoying an enviable reputation. We must not conclude, there, that all his volitions and actions are predictable; Macbeth's character, like any other man's at a given moment, is what is being made out of potentialities plus environment, and no one, not even Macbeth himself, can know all his inordinate self-love whose actions are discovered to be-and no doubt have been for a long time-determined mainly by an inordinate desire for some temporal or mutable good.

SAME MANUSCRIPT WITH MODIFIED WORDS

Macbeth is shown as an empowered man of well-established character, prosperous in several fields of life and enjoying an esteemed reputation. We mustn't conclude, therefore, that all of his volitions and actions will be foreseeable ; Macbeth's essence , like most other men at any given time , is what's being created out of potentialities and his environment, and no one, not even Macbeth himself, can discern all his immoderate self-love whose behaviors are found to be-and without doubt have been for some time-determined primarily by an extreme desire for a temporal or changeable good.



Detection of sentence or paragraph addition

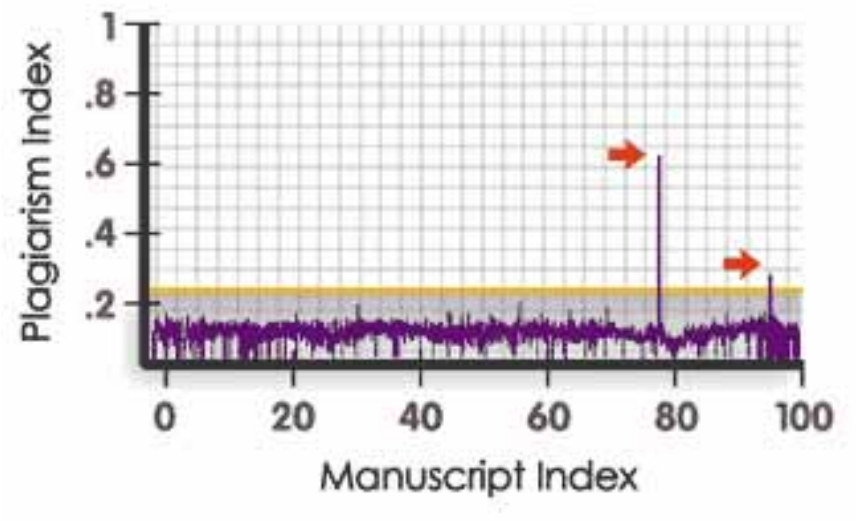
PAPER **A MACBETH INTERNET DERIVED PAPER (INTRO PARAGRAPH)**

Macbeth is presented as a mature man of definitely established character, successful in certain fields of activity and enjoying an enviable reputation. We must not conclude, there, that all his volitions and actions are predictable; Macbeth's character, like any other man's at a given moment, is what is being made out of potentialities plus environment, and no one, not even Macbeth himself, can know all his inordinate self-love whose actions are discovered to be-and no doubt have been for a long time-determined mainly by an inordinate desire for some temporal or mutable good.

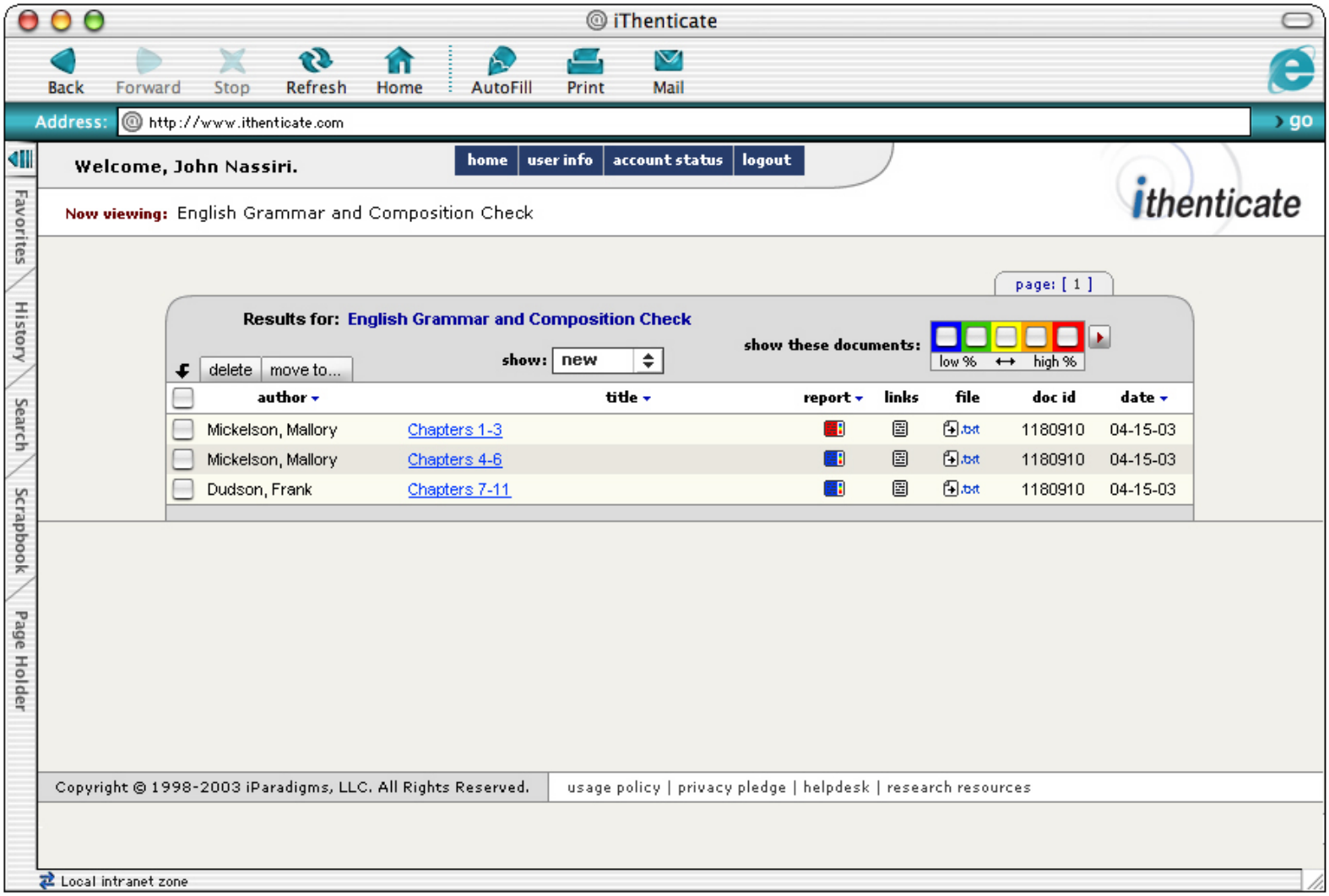
PAPER **A + B**

MACBETH MODIFIED TEST PAPER WITH COMBINED ADDED CONTENT

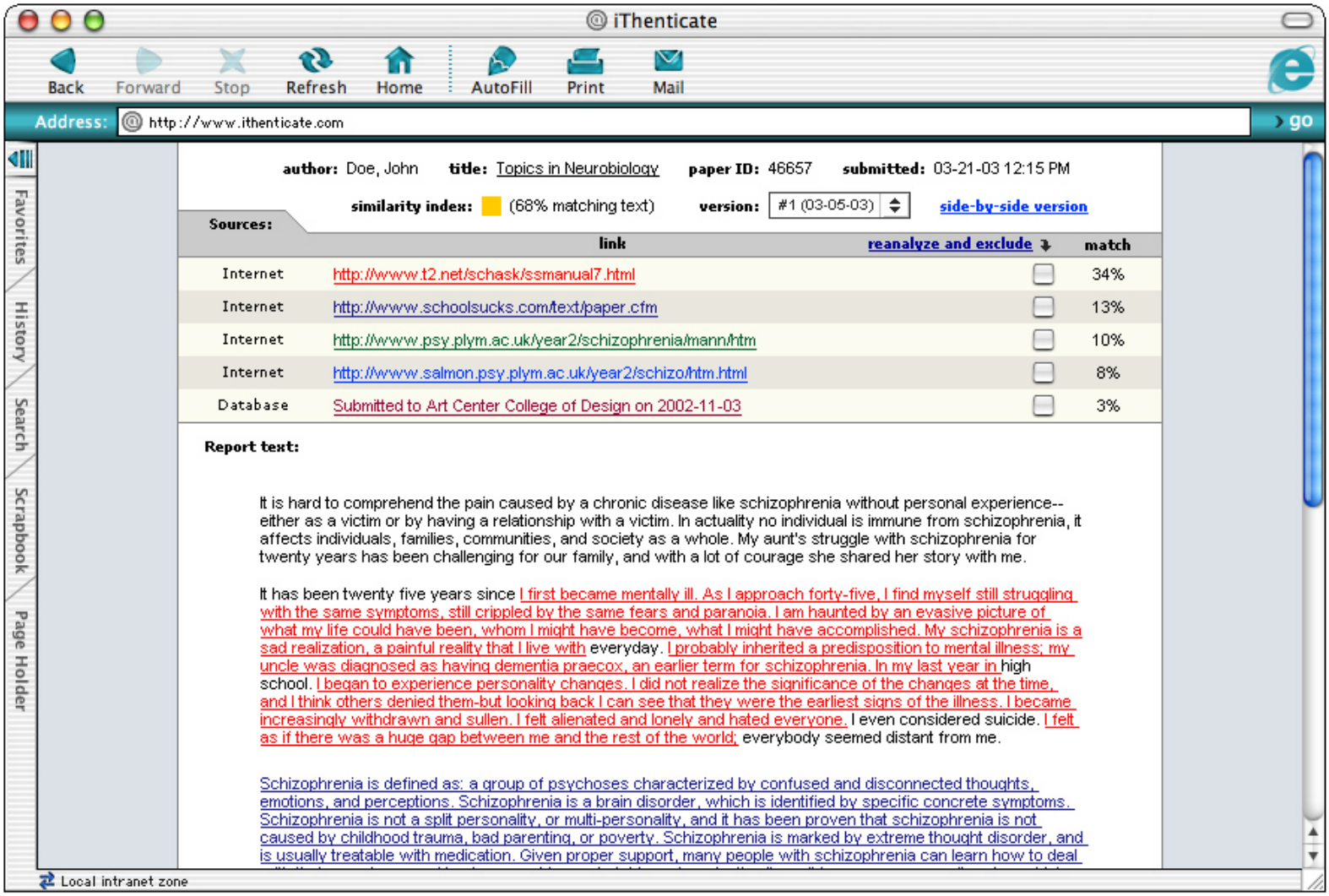
Shakespeare's famous play, Macbeth, is one of his great tragedies based around the classic theme of the hero's fatal flaw. Macbeth is presented as a mature man of definitely established character, successful in certain fields of activity and enjoying an enviable reputation. Yet, like any man, he is human, and thus in possession of flaw and foibles, hidden that they may be from public eye, and hinted at by foreshadow only by the author. We must not conclude, there, that all his volitions and actions are predictable; Macbeth's character, like any other man's at a given moment, is what is being made out of potentialities plus environment, and no one, not even Macbeth himself, can know all his inordinate self-love whose actions are discovered to be-and no doubt have been for a long time- determined mainly by an inordinate desire for some temporal or mutable good. This desire being so strong under certain circumstances as to override all others, even, as is usually the case in tragedy, the ultimate desire of self-preservation.



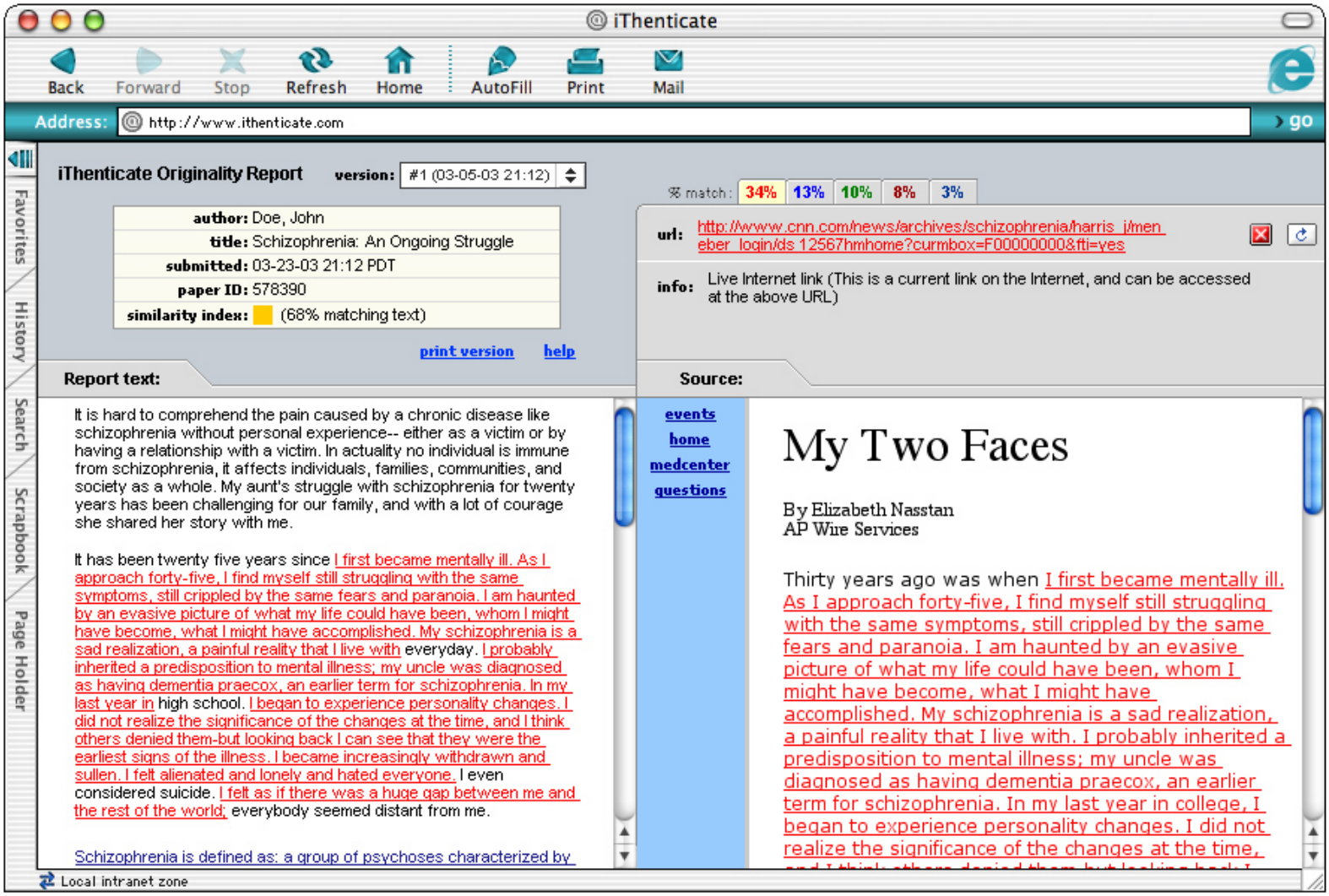
Suspect manuscripts are highlighted



Every instance of matching text is underlined and color-coded indicating the possible source

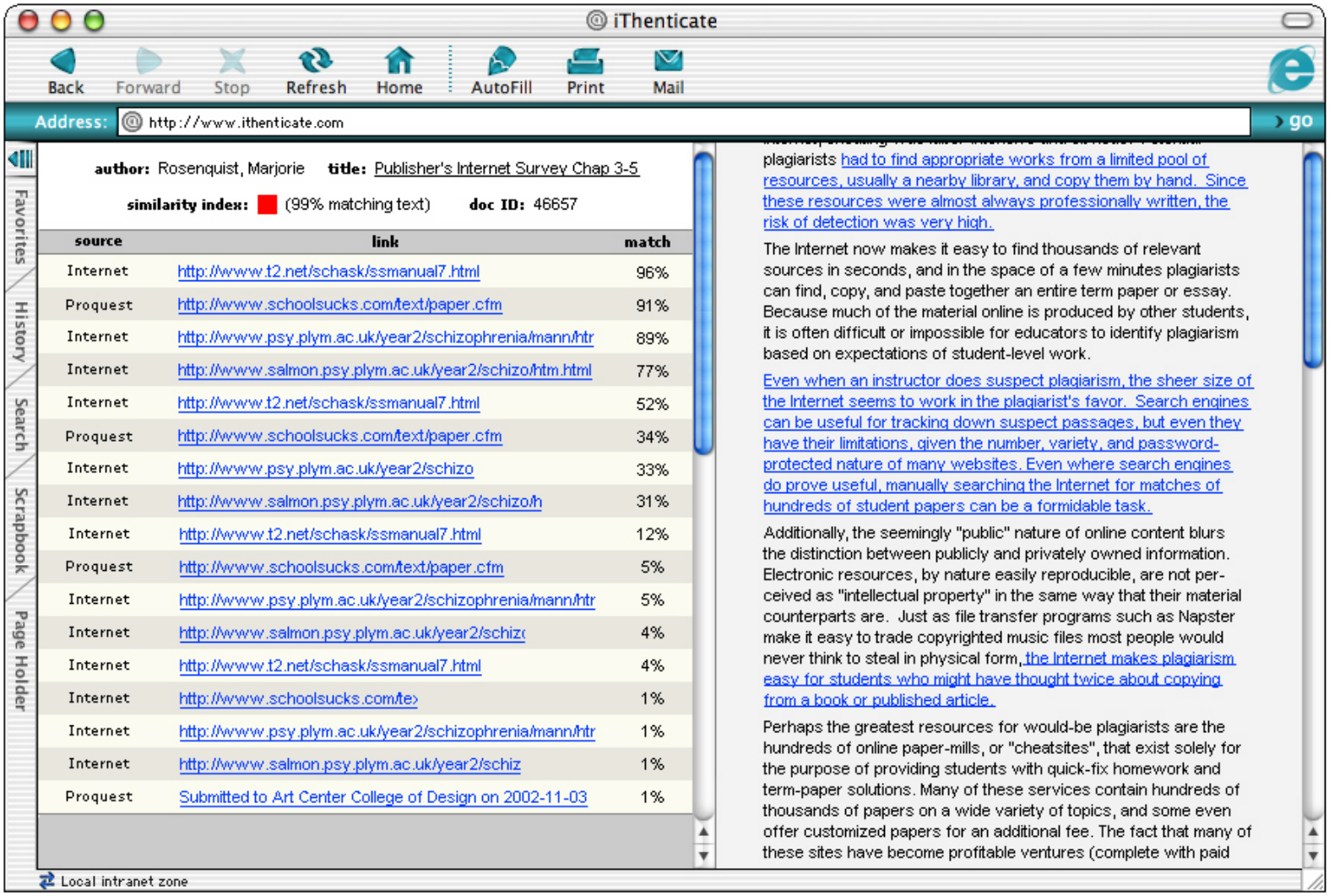


Individual sources can be directly compared to the original manuscript



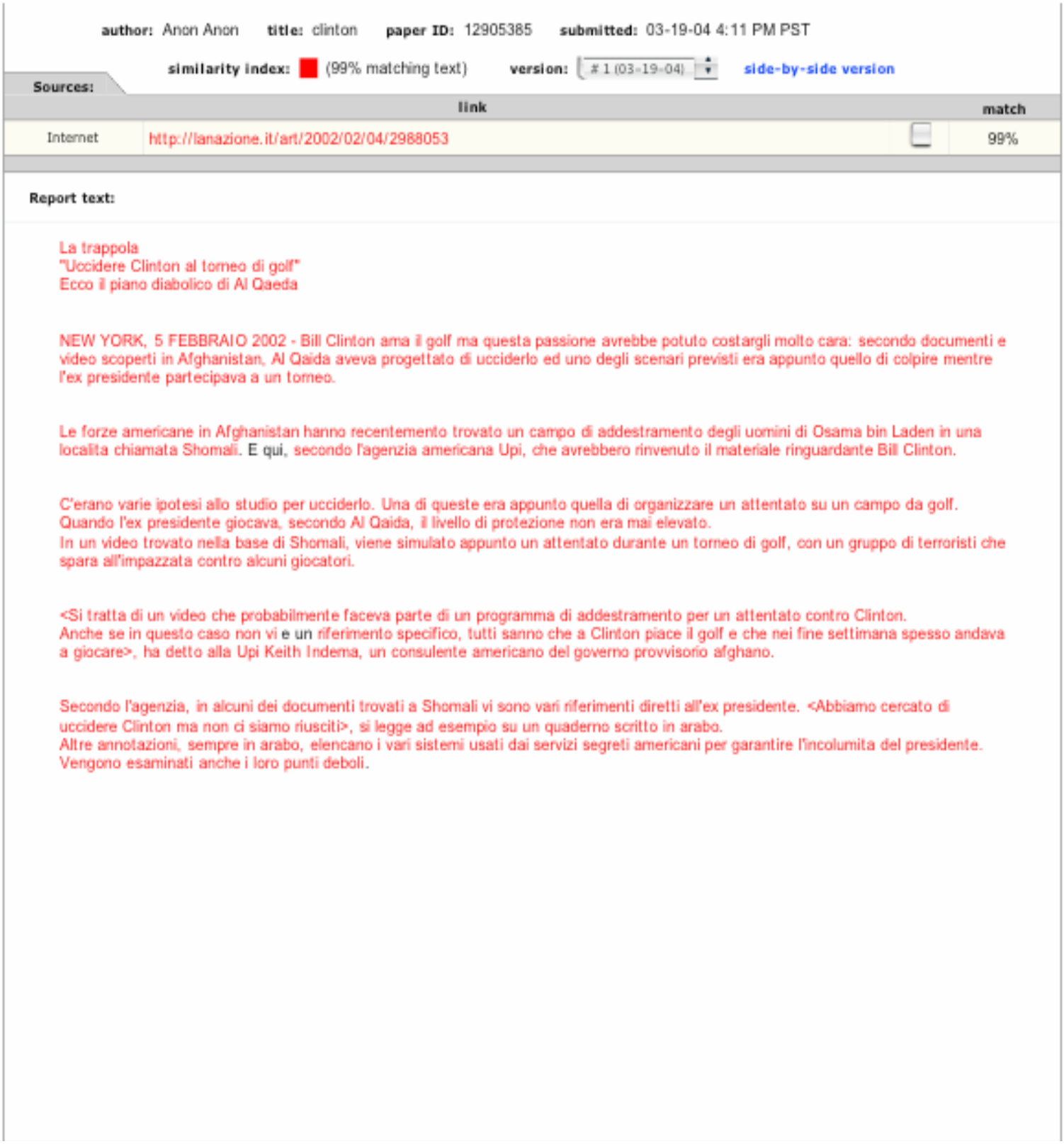
Publishers have an additional problem

As of mid-2001 there were more than 7,200 different pirated books on the Internet



A sample from La Nazione (5 Feb 2002)

A random article regarding Bill Clinton



author: Anon Anon **title:** clinton **paper ID:** 12905385 **submitted:** 03-19-04 4:11 PM PST

similarity index: (99% matching text) **version:** # 1 (03-19-04) side-by-side version

Sources:

	link	match
Internet	http://lanazione.it/art/2002/02/04/2988053	99%

Report text:

La trappola
"Uccidere Clinton al torneo di golf"
Ecco il piano diabolico di Al Qaeda

NEW YORK, 5 FEBBRAIO 2002 - Bill Clinton ama il golf ma questa passione avrebbe potuto costargli molto cara: secondo documenti e video scoperti in Afghanistan, Al Qaida aveva progettato di ucciderlo ed uno degli scenari previsti era appunto quello di colpire mentre l'ex presidente partecipava a un torneo.

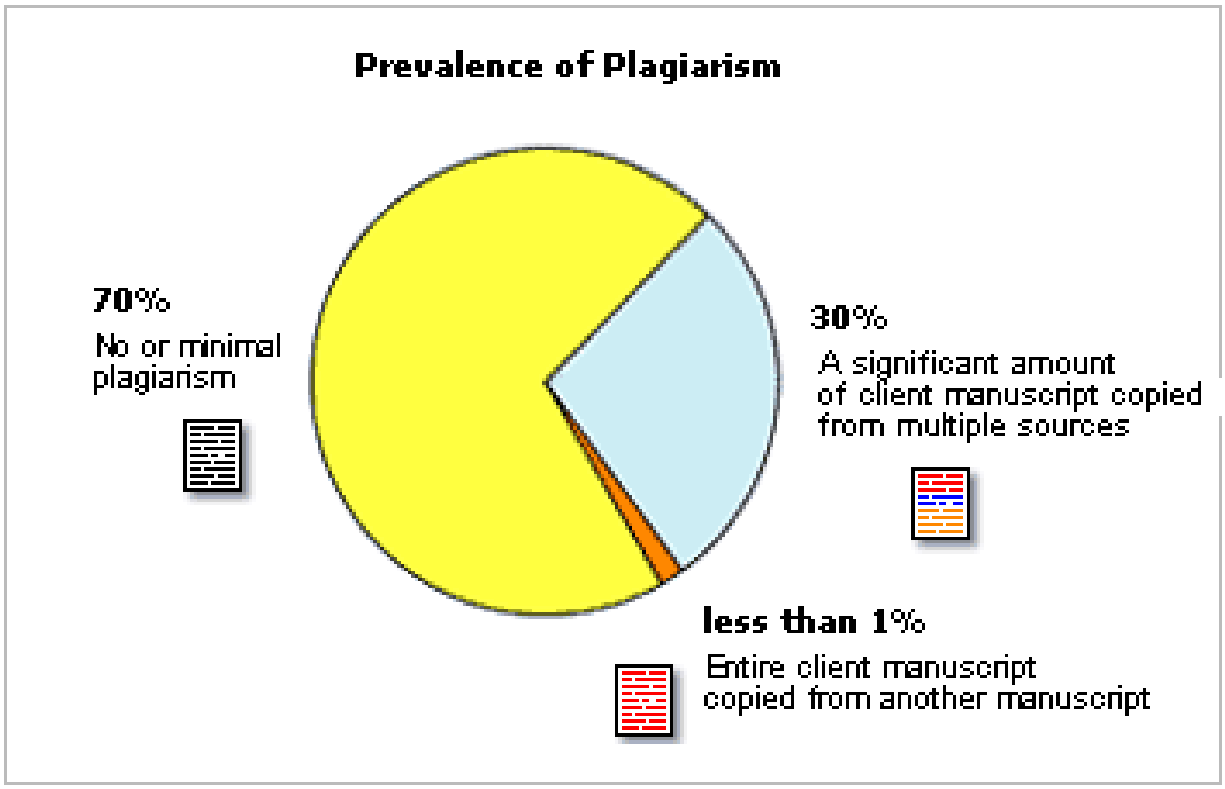
Le forze americane in Afghanistan hanno recentemento trovato un campo di addestramento degli uomini di Osama bin Laden in una localita chiamata Shomali. E qui, secondo l'agenzia americana Upi, che avrebbero rinvenuto il materiale ringuardante Bill Clinton.

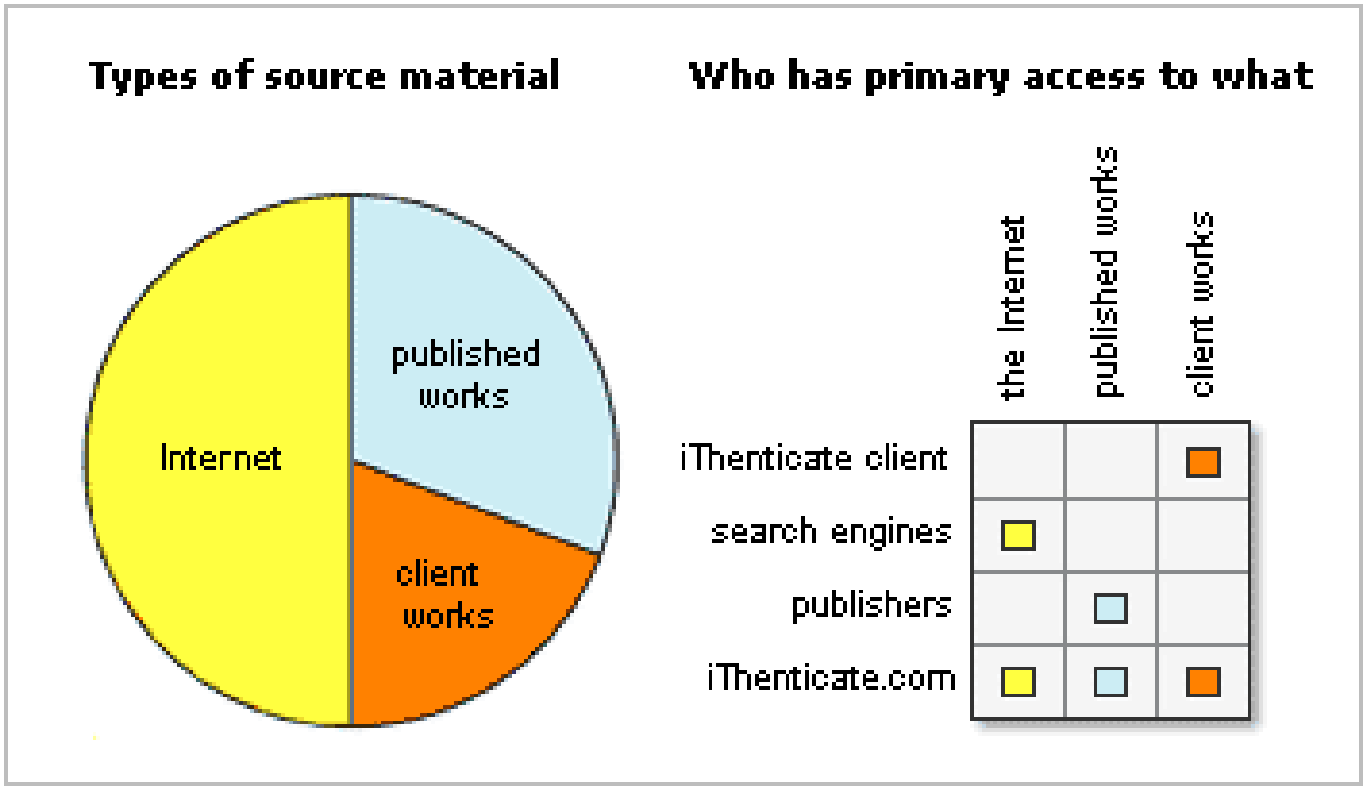
C'erano varie ipotesi allo studio per ucciderlo. Una di queste era appunto quella di organizzare un attentato su un campo da golf. Quando l'ex presidente giocava, secondo Al Qaida, il livello di protezione non era mai elevato.
In un video trovato nella base di Shomali, viene simulato appunto un attentato durante un torneo di golf, con un gruppo di terroristi che spara all'impazzata contro alcuni giocatori.

<Si tratta di un video che probabilmente faceva parte di un programma di addestramento per un attentato contro Clinton.
Anche se in questo caso non vi e un riferimento specifico, tutti sanno che a Clinton piace il golf e che nei fine settimana spesso andava a giocare>, ha detto alla Upi Keith Indema, un consulente americano del governo provvisorio afghano.

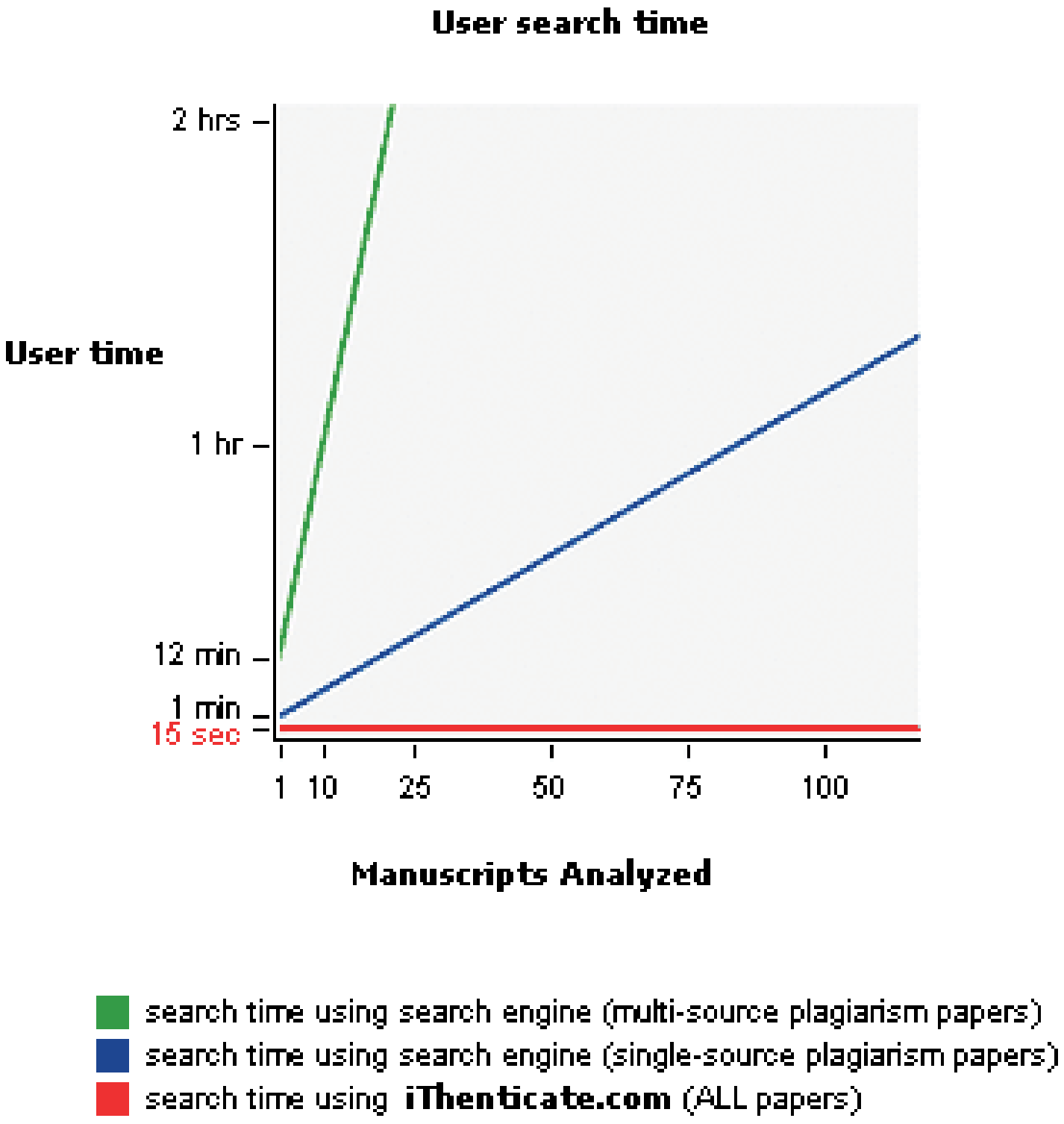
Secondo l'agenzia, in alcuni dei documenti trovati a Shomali vi sono vari riferimenti diretti all'ex presidente. <Abbiamo cercato di uccidere Clinton ma non ci siamo riusciti>, si legge ad esempio su un quaderno scritto in arabo.
Altre annotazioni, sempre in arabo, elencano i vari sistemi usati dai servizi segreti americani per garantire l'incolumita del presidente. Vengono esaminati anche i loro punti deboli.

Why not just use Google to search for source material?





Searching the Internet by hand is a massive time investment



Final Thought

- **We have always viewed Turnitin as a tool (not a complete solution) to stop academic plagiarism. Similarly, we are interested in working with colleagues such as yourselves to see how iThenticate can contribute to improvements in the best practices of publishing. We see iThenticate as a tool for pre-publishing due diligence and as a tool to detect post-publishing intellectual property theft.**

Thank you.

Intellectual Property (IP) — Copyright

The purpose of Copyright Law is "to promote the Progress of Science and useful Arts…."

U.S. Constitution, Art. I § 8, cl. 8.

"… the aim of copyright is to give an author an exclusive right sufficient to create an incentive to produce, but not so great a right as to undermine the public domain." These rights must be for a limited term and they must "promote the progress of science."

Lawrence Lessig, *The Future of Ideas* (New York: Random House, 2001), 98.

Copyright Law — Fair Use

“the fair use of a copyrighted work … for purposes such as criticism, comment, news reporting, teaching, scholarship, or research, is not an infringement of copyright.”

17 U.S.C.A. § 107.

Copyright Law — Legal Opinion

"… the Company's activity may be fairly characterized as 'criticism' as that term is used in the preamble of Section 107 of the Copyright Act. According to Webster's Dictionary (2d Ed., 1996), criticism means 'fault finding or censure' or 'the act of judging the merits of something.' By this definition, the Company, by investigating the integrity of an author's work, is engaged in a form of criticism: the Company is judging the merits of the author's work. As a result, we conclude that the Company's 'criticism' of written works constitutes the type of activity that the courts have traditionally characterized, and the legislature has recognized, as 'fair use' of copyrighted material. Our opinion is further supported by a closer look at whether the Company has sufficiently transformed the original author's work. Certainly, the Company's use involves a complete transformation of the raw material when the fingerprint is created. Further, the purpose of the Company's fingerprint creation and analysis is to identify potential plagiarism, which has absolutely nothing to do with the purpose of the original work."

Foley & Lardner, *Legal Opinion*, 2003.

Copyright Law — Legal Opinion

"…the Company's [originality] report, by identifying potential plagiarists, provides new insights and understandings about the original. We believe that the identification of plagiarists is the type of activity that the fair use doctrine is intended to protect for the 'enrichment of society.'"

Foley & Lardner, *Legal Opinion*, 2003.

Copyright Law — Legal Opinion

“In short, for the same reason delineated above with regard to our plagiarism analysis, we are of the opinion that storing a copy of an author’s work in a database to be used solely for the purpose of comparing the work to other works constitutes a ‘fair use’ of the work. In view of the foregoing, it is our opinion that under Copyright Law, both types of use by the company of written works, despite the lack of express consent of the author, fall within the ambit of the fair use doctrine and, accordingly, the Company should not be liable for the claims of copyright infringement … a court would find in favor of a defense of fair use.”

Foley & Lardner, *Legal Opinion*, 2003.

Copyright Law — Example of Fair Use

- Leslie A. Kelly was a photographer who posted his pictures on a website

- Arriba owned a search engine for images
  - They copied ALL of Kelly's pictures without permission
  - They copied the ENTIRE picture
  - They transformed the pictures into thumbnails
  - They stored the thumbnails in a database
  - They are a commercial venture and profited from their service
  - They did not harm the market value of Kelly's work

  - **The Court found that Arriba was making a fair use of Kelly's pictures.**

Kelly v. Arriba Soft Corp., 9th Cir., No. 00-55521, 2/6/02