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Abraham et al.

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(54) **SYSTEMS FOR AND METHODS OF USER DEMOGRAPHIC REPORTING USABLE FOR IDENTIFYING USERS AND COLLECTING USAGE DATA**

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(51) **Int. Cl.**
G06F 16/30 (2019.01)
H04L 12/26 (2006.01)
(Continued)

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CPC **H04L 43/0876** (2013.01); **G06Q 10/0637** (2013.01); **G06Q 30/02** (2013.01); **G06Q 30/0203** (2013.01); **G06Q 30/0204** (2013.01)

(58) **Field of Classification Search**
CPC G06F 17/30861
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,355,372 A 10/1982 Johnson et al.
RE31,951 E 7/1985 Johnson
(Continued)

FOREIGN PATENT DOCUMENTS

GB 2184576 A 6/1987
WO WO9641495 A1 12/1996
(Continued)

OTHER PUBLICATIONS

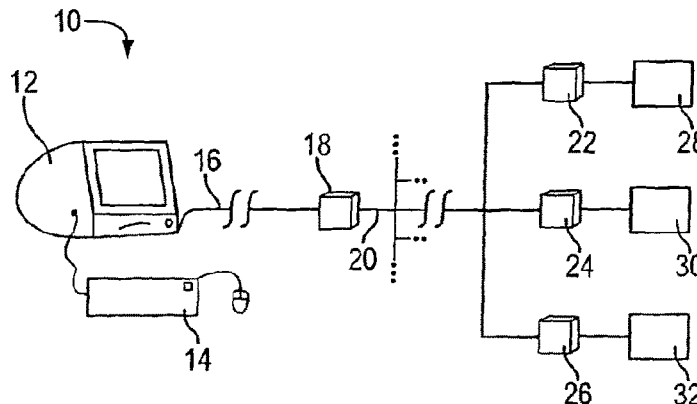
Office Action dated Jul. 23, 2008, For U.S. Appl. No. 10/358,377.
(Continued)

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(57) **ABSTRACT**

Several ways of identifying users and collecting demographic information and market information are disclosed, including branding a browser with a unique identification in each user request, identifying a user by his key strokes or mouse clicks, gathering demographic information using multiple data sets and by monitoring network traffic. Additionally, user requested content is distinguished from other, non-user content, and the performance of a server can be monitor and analyzed from a client perspective. Further, an Internet user's Internet data is routed to a known domain on the Internet, from which it is routed on to the intended recipient. The domain includes proxy servers which proxy the user's data requests to the domain, and database servers, which filter and build a database of the user's Internet usage. Particular data concerning certain behaviors of interest, such as purchasing data, is filtered into the database, and can form the basis for numerous market measures.

17 Claims, 24 Drawing Sheets



Related U.S. Application Data

continuation of application No. 10/358,377, filed on Feb. 5, 2003, now Pat. No. 7,930,285, which is a continuation-in-part of application No. 09/532,890, filed on Mar. 22, 2000, now Pat. No. 7,181,412.

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G06Q 10/06 (2012.01)
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(56) **References Cited**

U.S. PATENT DOCUMENTS

4,603,232 A	7/1986	Kurland	6,141,694 A	10/2000	Gardner	
4,621,334 A	11/1986	Garcia	6,141,759 A	10/2000	Braddy	
4,805,222 A	2/1989	Young	6,151,593 A	11/2000	Cho	
4,954,699 A	9/1990	Coffey	6,157,618 A	12/2000	Boss	
4,958,284 A	9/1990	Bishop	6,182,141 B1	1/2001	Blum	
5,023,929 A	6/1991	Call	6,193,153 B1	2/2001	Lambert	
5,060,140 A	10/1991	Brown	6,205,432 B1	3/2001	Gabbard	
5,481,294 A	1/1996	Thomas	6,212,565 B1	4/2001	Gupta	
5,488,408 A	1/1996	Maduzia et al.	6,225,995 B1	5/2001	Jacobs	
5,526,427 A	6/1996	Thomas et al.	6,256,644 B1	7/2001	Shibayama	
5,550,928 A	8/1996	Lu et al.	6,256,664 B1	7/2001	Donoho et al.	
5,557,686 A	9/1996	Brown et al.	6,256,737 B1	7/2001	Bianco	
5,584,050 A	12/1996	Lyons	6,263,371 B1	7/2001	Geagan	
5,594,934 A	1/1997	Lu	6,286,046 B1	9/2001	Bryant	
5,659,469 A	8/1997	Deaton et al.	6,338,066 B1	1/2002	Martin	
5,675,510 A	10/1997	Coffey et al.	6,351,810 B2	2/2002	Gupta	
5,710,887 A	1/1998	Chelliah	6,381,632 B1	4/2002	Lowell	
5,715,399 A	2/1998	Bezos	6,385,590 B1	5/2002	Levine	
5,727,159 A	3/1998	Kikinis	6,389,403 B1	5/2002	Dorak	
5,737,025 A	4/1998	Dougherty	6,389,462 B1	5/2002	Cohen	
5,737,026 A	4/1998	Lu	6,421,724 B1 *	7/2002	Nickerson	G06F 3/04847 709/219
5,751,450 A	5/1998	Robinson	6,421,733 B1	7/2002	Tso	
5,771,307 A	6/1998	Lu et al.	6,438,125 B1	8/2002	Brothers	
5,781,913 A	7/1998	Felsenstein	6,442,529 B1	8/2002	Krishan	
5,805,803 A	9/1998	Birrell et al.	6,442,687 B1	8/2002	Savage	
5,835,712 A	11/1998	DuFresne	6,449,739 B1	9/2002	Landan	
5,850,249 A	12/1998	Massetti	6,453,335 B1	9/2002	Kaufmann	
5,862,325 A	1/1999	Reed	6,463,457 B1	10/2002	Sletten	
5,870,546 A	2/1999	Kirsch	6,567,854 B1	5/2003	Olshansky	
5,872,850 A	2/1999	Klein	6,567,857 B1	5/2003	Gupta	
5,887,140 A	3/1999	Itsumi	6,584,567 B1	6/2003	Bellwood	
5,889,548 A	3/1999	Chan	6,606,581 B1	8/2003	Nickerson	
5,897,616 A	4/1999	Kanevsky	6,622,169 B2	9/2003	Kikinis	
5,918,014 A	6/1999	Robinson	6,678,685 B2	1/2004	McGill	
5,941,957 A	8/1999	Ingrassia	6,684,194 B1	1/2004	Eldering	
5,945,988 A	8/1999	Williams	6,694,431 B1	2/2004	Binding	
5,961,593 A	10/1999	Gabber	6,704,787 B1	3/2004	Umbreit	
5,970,469 A	10/1999	Scroggie	6,760,763 B2	7/2004	Jennings	
5,983,348 A	11/1999	Ji	6,839,680 B1	1/2005	Liu	
5,987,454 A	11/1999	Hobbs	6,856,963 B1	2/2005	Hurwitz	
5,991,735 A	11/1999	Gerace	6,857,009 B1	2/2005	Ferreria et al.	
6,006,197 A	12/1999	d Eon	6,883,032 B1	4/2005	Dempski	
6,006,260 A	12/1999	Barrick	6,892,235 B1	5/2005	Daude et al.	
6,012,090 A	1/2000	Chung et al.	7,020,700 B1	3/2006	Bennett et al.	
6,018,619 A	1/2000	Allard	7,039,599 B2	5/2006	Merriman	
6,021,439 A	2/2000	Turek et al.	7,080,077 B2	7/2006	Ramamurthy	
6,026,368 A	2/2000	Brown	7,092,296 B2	8/2006	Kato et al.	
6,049,821 A	4/2000	Theriault	7,092,926 B2	8/2006	Cerrato	
6,052,730 A	4/2000	Felciano	7,146,505 B1	12/2006	Harada	
6,058,381 A	5/2000	Nelson	7,181,412 B1	2/2007	Fulgoni	
6,062,474 A	5/2000	Kroll	7,243,129 B1	7/2007	Thomas	
6,070,145 A	5/2000	Pinsley	7,324,953 B1 *	1/2008	Murphy	G06Q 30/02 705/500
6,073,241 A	6/2000	Rosenberg	7,930,285 B2	4/2011	Abraham et al.	
6,081,900 A	6/2000	Subramaniam	8,751,461 B2	6/2014	Abraham et al.	
6,094,673 A	7/2000	Dilip	2001/0014868 A1	8/2001	Herz	
6,115,680 A	9/2000	Coffee	2001/0014915 A1	8/2001	Blumenau	
			2001/0020242 A1	9/2001	Gupta	
			2001/0034638 A1	10/2001	Kelley	
			2002/0023004 A1 *	2/2002	Hollander	G06Q 20/203 705/22
			2002/0032602 A1 *	3/2002	Lanzillo, Jr.	G06Q 30/02 705/14.66
			2002/0062223 A1 *	5/2002	Waugh	G06Q 30/02 705/1.1
			2002/0069368 A1	6/2002	Hines	
			2002/0077903 A1	6/2002	Feldman	
			2002/0099605 A1	7/2002	Weitzman	
			2002/0099832 A1	7/2002	Yaegerman	
			2002/0116266 A1	8/2002	Marshall	
			2002/0124074 A1 *	9/2002	Levy	G06F 11/3495 709/224
			2002/0128803 A1	9/2002	Skinner	
			2002/0128925 A1	9/2002	Angeles	
			2002/0178257 A1	11/2002	Cerrato	
			2003/0009762 A1	1/2003	Hooper	

(56)

References Cited

U.S. PATENT DOCUMENTS

2003/0065595 A1 4/2003 Anglum
 2003/0076305 A1 4/2003 Allen
 2003/0083938 A1* 5/2003 Smith G06Q 30/02
 705/14.53

FOREIGN PATENT DOCUMENTS

WO WO9831155 A2 7/1998
 WO 00/55783 A1 9/2000
 WO WO0054214 A1 9/2000
 WO WO0171620 A1 9/2001
 WO WO0152462 A3 1/2002
 WO WO0250694 A1 6/2002
 WO WO03067376 A3 12/2003

OTHER PUBLICATIONS

- Office Action dated Dec. 18, 2008, for U.S. Appl. No. 10/358,377.
 Office Action for U.S. Appl. No. 10/358,377, mailed Sep. 9, 2009.
 Office Action for U.S. Appl. No. 11/836,075, mailed Dec. 8, 2009, 27 pages.
 Non-final Office Action mailed Oct. 17, 2008 in U.S. Appl. No. 11/619,795 (30 pages).
 Final Office Action mailed Jun. 2, 2009 in U.S. Appl. No. 11/619,795 (41 pages).
 Non-final Office Action mailed Apr. 28, 2010 in U.S. Appl. No. 10/358,377 (25 pages).
 Final Office Action for U.S. Appl. No. 11/836,075, mailed Aug. 17, 2010, 26 pages.
 U.S. Notice of Allowance mailed Dec. 3, 2010 in U.S. Appl. No. 10/358,377 (19 pages).
 U.S. Advisory Action mailed Sep. 24, 2009 in U.S. Appl. No. 11/619,795, 3 pages.
 Office Action issued in U.S. Appl. No. 11/836,075 on Nov. 29, 2012, 46 pages.
 Office Action issued in U.S. Appl. No. 12/347,464 on Jun. 5, 2013, 56 pages.
 Office Action issued in U.S. Appl. No. 13/078,667 on Jul. 2, 2012, 42 pages.
 Office Action issued in U.S. Appl. No. 13/078,667 on Feb. 4, 2013, 38 pages.
 Office Action issued in U.S. Appl. No. 13/078,667 on Aug. 1, 2013, 15 pages.
 Notice of Allowance issued in U.S. Appl. No. 13/078,667 on Jan. 9, 2014, 13 pages.
 Office Action issued in U.S. Appl. No. 12/347,464 on Apr. 7, 2014, 26 pages.
 Bascou, Jean-Jacques & Redon, Laurence, "Improving Security by Analysing Users' Behavior," in Proceedings of the Pacific Telecommunications Council Seventeenth Annual Conference 615 (Dan J. Wedemeyer & Richard Nickelson eds. 1995).
 Boyan, J. "The Anonymizer—Protecting User Privacy on the Web," Computer-Mediated Communication Magazine, Online! 1997, XP002231197, <http://www.december.com/cm/mag/1997/sep/toc.html>, retrieved on 1997.
 Brad Hill, WebTV for Dummies, "Creating Family Accounts" (Foster City, CA, 2000), pp. 69-72.
 Chan, Yuen-Yan, "On privacy issues of Internet access services via proxy servers," Secure Networking—Core 'Secure!' 99, International Exhibition and Congress. Proceedings (Lecture Notes in Computer Science vol. 1740) Springer-Verlag Berlin, Germany, 1999, pp. 183-191, XP09055060.
 Chapman D. B. et al., "Building Internet Firewalls Proxy Systems," Building Internet Firewalls, Sep. 1995 (Sep. 1995), pp. 189-205, XP002911985.
 Choo C. W. et al. "A behavioral model of information seeking on the Web: preliminary results of a study of how managers and IT the American Society for Information Science, vol. 35, Inf. Today Medford, NJ, USA, 1998, pp. 290-302, XP009056075.
 Diffie W. et al., "Privacy and Authentication: An Introduction to Cryptography" Proceedings of the IEEE, IEEE, New York, US, vol. 67, No. 3, Mar. 1979 (Mar. 1979), pp. 397-426, XP000575227.
 Dossick, S. E et al., "WWW access to legacy client/server applications," Computer Networks and ISDN Systems, North Holland Publishing, Amsterdam, NL, vol. 28, No. 11, May 1996 (May 1996), pp. 931-940, XP004018197.
 Expert Report of Dr. Benjamin Goldberg re Invalidity Exhibit C to Expert Report, Civil Action No. 1:11-cv-290-LMB-TRJ, Jul. 1, 2011 (36 pages).
 Expert Report: of Dr. Benjamin Goldberg re Invalidity Exhibit D, Civil Action No. 1:11-cv-290-LMB-TRJ, Jul. 1, 2011 (24 pages).
 Expert Report of Dr. Benjamin Goldberg re Invalidity, Civil Action No. 1:11-cv-290-LMB-TRJ, Jul. 1, 2011 (119 pages).
 Furnell et al., "A comprehensive authentication and supervision architecture for networked multimedia systems," in Communications and Multimedia Security vol. 3 227 (Sokratis K Katsikas ed. 1997).
 Furnell et al., "Applications of keystroke analysis for improved login security and continuous user authentication," in Information Systems Security 283 (Sokratis K. Katsikas & Dirmtris Grizalis eds. 1996).
 Goldberg Reply Expert Report re Invalidity, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 5, 2011 (78 pages).
 Goldberg Supplemental Expert Report re Invalidity (*comScore v. Nielsen*), Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (13 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 1, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (190 pages).
 Goldberg Supplement Expert Report re Invalidity Exhibit 2, civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (80 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 3, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (2 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 4, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (4 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 5, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (4 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 6, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (3 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 7, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (4 pages).
 Goldberg Supplemental Expert Report re Invalidity Exhibit 8, Civil Action No. 1:11-cv-290-LMB-TRJ, Aug. 12, 2011 (5 pages).
 Hargittai, Eszter, "Beyond Logs and Surveys: In-Depth Measures of People's Web Use Skills," Journal of the American Society of Information Science and Technology, vol. 53, No. 14, pp. 1239-1244, 2002.
 Lee, J. et al., "Visualization and Analysis of Clickstream Data of Online Stores for Understanding Web Merchandising," IBM Institute of Advanced Commerce Technical Papers, Online!, Jan. 1, 2000 (Jan. 1, 2000), XP002208026, <http://www.research.ibm.com/iac/papers/lee.pdf>, retrieved on 2000.
 Leggett et al., "Dynamic identity verification via keystroke characteristics," in Int. J. Man-Machine Studies 859 (1991).
 Leggett et al., "Verification of User Identity via Keyboard Characteristics," in Human Factors in Management Information Systems 29 (Jane M. Carey ed. 1988).
 Mambo, M. et al., "Proxy Cryptosystems: Delegation of the Power to Decrypt Ciphertexts" IEICE Transactions of Fundamentals of Electronics, Communications and Computer Sciences, Institute of Electronics Information and Comm. Eng. Tokyo, JP, vol. E80-A, No. 1, Jan. 1997 (Jan. 1997), pp. 54-63, XP000742245.
 Monrose, F., et al, 'Authentication via keystroke dynamics', ACM Press, 1997, entire document, <http://delivery.acm.org/10.1145/270000/266434/p48-monrose.pdf?key1=266434&key2=9684754711&coll=portal&dl=ACM&CFID=14258302&CFTOKEN=37117304>.
 Monrose, F., et al., "Keystroke dynamics as a biometric for authentication," Future Generation Computer Systems 16 (2000) 351-359, XP4185847.

(56)

References Cited

OTHER PUBLICATIONS

Elsevier Science Publishers, Amsterdam, NL, vol. 16, No. 4, Feb. 2000 (Feb. 2000), pp. 379-391, XP004185850.

Sadun, Erica et al., WebTV, "Administrating Your WebTV Account" (Foster City, CA, 2000), pp. 311-319.

Song et al., "User Recognition by Keystroke Latency Pattern Analysis" (1998).

Srivastava, J., et al. "Web Usage Mining: Discovery and Applications of Usage Patterns from Web Data" ACM SIGKDD Explorations Newsletter, vol. 1, Issue 2, pp. 12-33, Jan. 2000.

Zaiane O. R. et al., "Discovering Web access patterns and trends by applying OLAP and data mining technology on Web logs," Research and Technology Advances in Digital Libraries, 1998, ADL 98, Proceedings, IEEE International Forum on Santa Barbara, CA, US Apr. 22-24, 1998, Los Alamitos, CA, USA, IEEE Compt. Soc, US, Apr. 22, 1998 (Apr. 22, 1998), pp. 19-29, XP010276880.

Zenel, B. "A General Purpose Proxy Filtering Mechanism Applied to the Mobile Environment," Wireless Networks, ACM, US, vol. 5, No. 5, Oct. 1999 (Oct. 1999), pp. 391-409, XP000902494.

International Search Report mailed Nov. 8, 2005 for International Application No. EP 01922473.

Search Report for PCT Appliation Serial No. PCT/US03/03225.

Supplementary Search for EP Application Serial No. 01922473.2 mailed Aug. 11, 2005.

Supplementary European Search Report for European Application No. EP 03 73 7601 mailed Nov. 10, 2008, 3 pages.

European First Examination Report for Patent Application No. 03737601.9 dated May 4, 2010 (5 pages).

European Examination Report for Application No. 03737601.9 mailed Mar. 15, 2011 (5 pages).

Memo Concerning Mexican Office Action for Application No. PA/a/2002/009205, Oct. 9, 2006 (2 pages).

Canadian Office Action for Application No. 2,474,815 dated Jun. 9, 2009, 2 pages.

Canadian Office Action for Application No. 2,474,815 dated May 18, 2011, 3 pages.

Canadian Office Action for Application No. 2,474,815 dated Dec. 4, 2007, 3 pages.

Supplementary European Search Report for Application No. 0373601.9 mailed Nov. 10, 2008 (3 pages).

European Patent Office Summon to attend oral proceedings pursuant to Rule 115(1) EPC for Application No. 03737601.9 mailed Nov. 8, 2011, 8 pages.

Canadian Office Action for Application No. 2,403,879 dated Dec. 8, 2011, 4 pages.

Canadian Office for Application No. 2,403,879 dated Jun. 3, 2013, 5 pages.

* cited by examiner

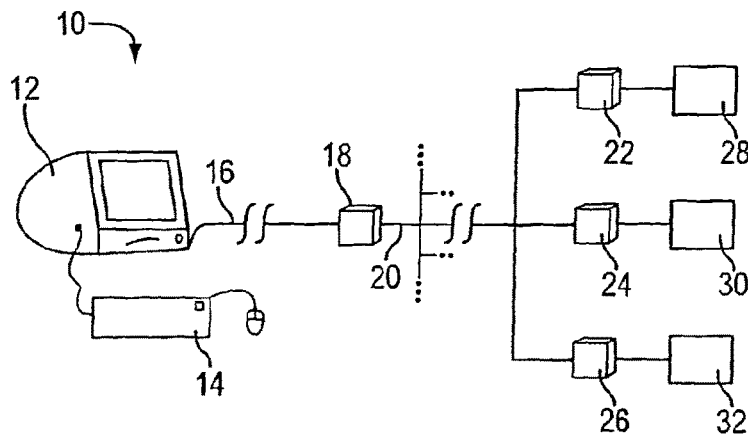


FIG. 1

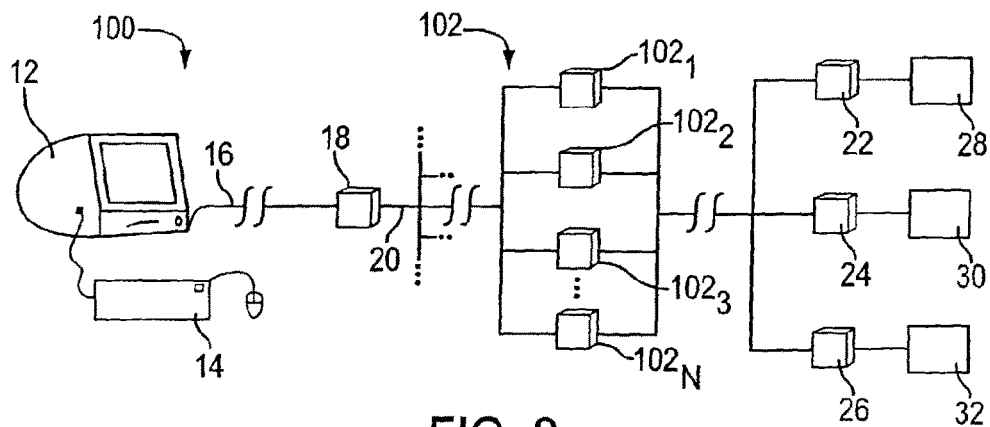


FIG. 2

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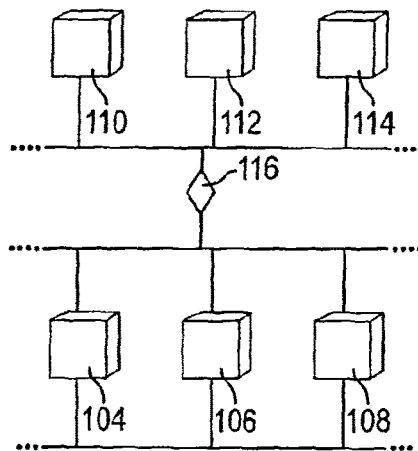


FIG. 3

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