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(54) **USER SEGMENT POPULATION TECHNIQUES**

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(52) **U.S. Cl.** ..... **707/747**

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See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

5,530,939	A	6/1996	Mansfield, Jr et al.
5,721,831	A	2/1998	Waits et al.
5,742,806	A	4/1998	Reiner et al.
5,870,746	A	2/1999	Knutson et al.
6,003,036	A	12/1999	Martin
6,078,891	A	6/2000	Riordan et al.

6,112,186	A	8/2000	Bergh et al.	
6,374,263	B1 *	4/2002	Bunger et al.	1/1
6,377,993	B1 *	4/2002	Brandt et al.	709/227
6,430,539	B1	8/2002	Lazarus et al.	
6,609,131	B1	8/2003	Zait et al.	
6,615,258	B1 *	9/2003	Barry et al.	709/223
6,629,102	B1 *	9/2003	Malloy et al.	1/1
6,694,322	B2 *	2/2004	Warren et al.	1/1
6,785,666	B1 *	8/2004	Nareddy et al.	1/1
6,839,682	B1	1/2005	Blume et al.	
6,873,981	B2 *	3/2005	Nareddy et al.	1/1
6,917,972	B1 *	7/2005	Basko et al.	709/224
6,993,529	B1 *	1/2006	Basko et al.	1/1
7,035,925	B1 *	4/2006	Nareddy et al.	709/224

(Continued)

**OTHER PUBLICATIONS**

Maurer, W. D. And Lewis, T. G. 1975. Hash Table Methods. ACM  
Comput. Surv. 7, 1 (Mar. 1975), 5-19. Doi= <http://doi.acm.org/10.1145/356643.356645>.\*

(Continued)

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(57) **ABSTRACT**

A facility for populating a segment from a population of individuals is described. The facility accesses two or more fact tables, each containing data about attributes of a number of users who are members of a number of arbitrary user groups. The facility generates a number of column chunks from each fact table. Each column chunk contains data about a single attribute of users that are members of a single arbitrary user group. The facility applies a segment membership test that tests particular user attributes to each arbitrary user groups in turn. In doing so, the facility collects the generated column chunks that contain data about attributes of users that are members of the current arbitrary user group tested by the segment membership test. The facility applies the segment membership test to the collected column chunks to identify individuals within the arbitrary user group that satisfy the segment membership test.

**12 Claims, 24 Drawing Sheets**

