

Note: Subclasses 707/600-831 were established as a result of the reclassification of 707/1-206 in January 2010. Documents from abolished subclasses 707/1-206 are in the process of being reclassified. Documents from 707/1-206 have been temporarily transferred to cross-reference art collections (XRACs) 707/999.001-999.206, pending completion of the reclassification of all documents in the abolished subclasses.

600	DATA WAREHOUSE, DATA MART, ONLINE ANALYTICAL PROCESSING (OLAP), DECISION SUPPORT SYSTEMS	630	....Push-to-nearest-neighbor
601	..Tools to automate schema definition process	631	....Push-to-broadcast
602	..Data extraction, transformation, and loading (ETL)	632	...Pull subscriptions
603	..Reporting, knowledge discovery (KD) systems	633	...Replication agent
604	..Using a denormalized schema	634	..Management, interface, monitoring and configurations of replication
605	..Using a star schema	635	..Replication-to-heterogeneous database
606	..Using a snowflake schema	636	..Distributor management
607	ONLINE TRANSACTIONAL PROCESSING (OLTP) SYSTEM	637	..Optimizing replication
608	COLLABORATIVE DOCUMENT DATABASE AND WORKFLOW	638	..Replication version control (i.e., version management)
609	FILE OR DATABASE MAINTENANCE	639	..Snapshot replication
610	..Synchronization (i.e., replication)	640	..Database backup
611	..Synchronous	641	..Merging data for backup
612	...Multiway synchronization	642	..Data dump
613	..Asynchronous synchronization (e.g., message or notification based)	643	..Batch
614	...Multiway synchronization	644	..Types of backup
615	...Transactional replication	645	...Full backup
616	...Merge replication	646	...Incremental backup
617	..Connection based synchronization	647	...Partial backup
618	..Scheduled synchronization	648	...Transaction log backup (i.e., audit file, journal)
619	...Background replication	649	...Database snapshots or database checkpointing
620	..Synchronization environment	650	...System data backup
621	...Portable devices	651	...Hierarchical backup
622	...Peer-to-peer	652	...Distributed backup
623	...Master/slave	653	...Customized backup
624	..Incremental synchronization	654	..Backup interface, scheduling and management
625	...Change records or delta	655	..Database mirroring
626	..Objects of replication	656	...Synchronous mirroring
627	...Publication	657	....Copy-on-write
628	...Push subscriptions	658	...Asynchronous mirroring
629	....Push-to-master	659	...Mirroring configuration and management
		660	...Mirroring optimization
		661	..Database archive
		662	..Deletion, retention or expiration of archive records
		663	...Deletion due to expiration
		664	...Deletion due to duplication
		665	..Rules for archiving
		666	...Records that have expired in the database
		667	..Means for or methods of archiving
		668	...Automatic archiving
		669	....Data dump
		670	....Transparently archiving data
		671	...Manual archiving

672	..Log of the archive	715	..Based on index optimization
673	..Indexing the archive	716	..Based on access path
674	.Database recovery	717	..Based on materialized view
675	..Database recovery model	718	..Query execution plan
676	...Full database recovery	719	..Query cost estimation
677	...Simple database recovery	720	...Based on resource consumption
678	..Database recovery phase	721	..Based on query history
679	...Database restore	722	.Post processing of search results
680	....Complete database restore	723	..Ranking search results
681	....Differential database restore	724	...Spatial (i.e., location based)
682	....Restoring backups of transaction log	725	...Temporal (i.e., time based)
683	...Redo (i.e., roll forward)	726	...Links from other files or link content analysis
684	...Undo (i.e., roll back)	727	...Frequency of document selection
685	..Incremental Recovery	728	...Relevance of document based on features in query
686	..Recovery optimization	729	...Location of features in the document
687	DATA INTEGRITY	730	...Frequency of features in the document
688	..Statistics maintenance	731	...Based on category of the query and the document
689	..Detection of expired data	732	...Personalized results
690	..Checking consistency	733	...Explicit profile
691	..Repair consistency errors	734	...Implicit profile
692	..Data cleansing, data scrubbing, and deleting duplicates	735	...Artificial Inflation of Search Rank
693	..Fragmentation, compaction and compression	736	..Preparing data for information retrieval
694	..Policy, rule-based management of records, files, and documents	737	..Clustering and grouping
695	..Version management	738	...Based on topic
696	..Index maintenance	739	...Latent semantic index or analysis (LSI or LSA)
697	..Using checksum	740	...Cataloging
698	..Using hash function	741	..Generating an index
699	..Using cyclic redundancy checking (CRC)	742	...Inverted index
700	..Range checking	743	...Spatial index
701	..Type checking	744	...Sparse index
702	..Triggers, stored procedures, user defined function (UDF)	745	...Bitmap index
703	..Transactional processing	746	...Temporal index
704	..Concurrent read/write management using locks	747	...Using a hash
705	DATABASE AND FILE ACCESS	748	..Ranking, scoring, and weighting records
706	..Search engines	749	...Based on record similarity and relevance
707	..Search engine portal (e.g., metasearch engine)	750	...Based on term frequency of appearance
708	...Analyzing or parsing query to determine topic or category	751	...Based on historical data
709	..Web crawlers	752	..Sorting and ordering data
710	..Category specific web crawling	753	...Sorting indices
711	..Index generation	754	..Filtering data
712	..Embedded or hardware based search engine		
713	..Query optimization		
714	..Based on joins		

755	..Parsing data structures and data objects	796	...Including structural features to support data retrieval and/or manipulation
756	..Transforming data structures and data objects	797	..Trees
757	..Hiding and masking database data	798	..Graphs
758	..Record, file, and data search and comparisons	799	..Queues
759	..Query statement modification	800	..Linked lists
760	...Translating a query to another language or schema	801	..Arrays
761	....Verifying or testing translated query	802	.Database and data structure management
762	....Legacy query generator	803	..Database, schema, and data structure creation and/or modification
763	....Query mapping	804	...Automatic generation based on input file or data
764	...For parallel processing system	805	...Via a graphical user interface
765	...Query expansion or refinement	806	....Maintaining schema version information
766	....Interactive query refinement	807	....Through the use of structural data to support dynamic schemas
767	....Recommending or suggesting search terms and queries	808	...Merging schemas
768	....Based on query history	809	..Moving data from one schema or structure to another
769	..Database query processing	810	...Through the use of a logical data model
770	..Distributed search and retrieval	811	...From unstructured or semi-structured data to structured data
771	...Analyzing or parsing query to determine topic or category	812	..Data storage operations
772	...Query-by-example	813	GARBAGE COLLECTION
773	...Recursive queries	814	.Reference counting
774	...Nested queries	815	..Cyclic
775	...Cascading queries	816	.Mark-sweep
776	...Data mining	817	.Mark-compact
777	....Taxonomy discovery	818	.Copying
778	....Hierarchical structures	819	.Generational
779	...Query templates	820	.Incremental
780	...Fuzzy searching and comparisons	821	FILE MANAGEMENT
781	.Database access control methods	822	.File systems
782	..Alternative access and redirection	823	..Disk file systems
783	..Privileged access	824	..Flash file systems
784	...Based on user profile	825	..Database file systems
785	....Access control lists	826	..Transactional file systems
786	....Hierarchical access control	827	..Network file systems
787	....Temporal access control	828	.File directory structure
788	....Spatial access control	829	..Hierarchical structure
790	DATABASE DESIGN	830	..Indexing structure
791	.Data structure types	831	..Virtual directory structure
792	..Database management system frameworks	899	MISCELLANEOUS
793	..Custom data structure types		
794	...Semantic network		
795	...Including data structures referencing externally stored data		

E-SUBCLASSES

The following subclasses beginning with the letter E are E-subclasses. Each E-subclass corresponds in scope to a classification in a foreign classification system, for example, the European Classification system (ECLA). The foreign classification equivalent to an E-subclass is identified in the subclass definition. In addition to U.S. documents classified in E-subclasses by U.S. examiners, documents are regularly classified in E-subclasses according to the classification practices of any foreign Offices identified in parentheses at the end of the title. For example, "(EPO)" at the end of a title indicates both European and U.S. patent documents, as classified by the EPO, are regularly added to the subclass. E-subclasses may contain subject matter outside the scope of this class. Consult the E-subclass definitions, or the documents themselves, to clarify or interpret titles.

E17.001 **INFORMATION RETRIEVAL; DATABASE STRUCTURES THEREFORE (EPO)**
 E17.002 .Data Indexing; Abstracting; Data Reduction (EPO)
 E17.003 ..Of chemical information (EPO)
 E17.004 ..Of images (EPO)
 E17.005 .Interfaces; database management systems; updating (EPO)
 E17.006 ..File format conversion (EPO)
 E17.007 .Concurrency control and recovery (EPO)
 E17.008 .Document retrieval systems (EPO)
 E17.009 .Information processing systems, e.g., multimedia systems, etc. (EPO)
 E17.01 .File systems; file servers (EPO)
 E17.011 .Processing chained data, e.g., graphs, linked lists, etc. (EPO)
 E17.012 ..Trees (EPO)
 E17.013 ..Hypermedia (EPO)
 E17.014 .Query processing for the retrieval of structured data (EPO)
 E17.015 ..Natural language query interface (EPO)

E17.016 ..Menu driven systems; graphical querying; query-by-example (EPO)
 E17.017 ..Query optimization (EPO)
 E17.018 .In geographical information databases (EPO)
 E17.019 .In image databases (EPO)
 E17.02 ..Based on image content (EPO)
 E17.021 ...Using color (EPO)
 E17.022 ...Using extracted text (EPO)
 E17.023 ...Using a combination of image content features (EPO)
 E17.024 ...Using shape and object relationship (EPO)
 E17.025 ...Using texture (EPO)
 E17.026 ..Based on bibliographical data of images (EPO)
 E17.027 ..The images having vectorial formats (EPO)
 E17.028 ..The images being video sequences (EPO)
 E17.029 ..By browsing (EPO)
 E17.03 ..By graphical querying (EPO)
 E17.031 ..Data organization and access thereof (EPO)
 E17.032 .Using distributed data base systems, e.g., networks, etc. (EPO)
 E17.033 .Processing unordered data (EPO)
 E17.034 ..Random access (EPO)
 E17.035 ...Using parallel associative memories (EPO)
 E17.036 ...By address calculation or conversion, e.g., hashing, etc. (EPO)
 E17.037 ...Using directory or table lookup (EPO)
 E17.038 ...Using more than one table in sequence, i.e., systems with three or more layers, etc. (EPO)
 E17.039 ..Sequential access, e.g., string matching, etc. (EPO)
 E17.04 ...On static storage (EPO)
 E17.041 ...Comparing simultaneously a plurality of search arguments with a simple file data, finite state machine (EPO)
 E17.042 ...Comparing simultaneously search arguments with more than one file data (EPO)
 E17.043 ...Comparing simultaneously search arguments with more than one file data (EPO)
 E17.044 .In structured data stores (EPO)

- E17.045 ..Relational databases (EPO)
- E17.046 ...Clustering or classification (EPO)
- E17.047Including cluster or class visualization or browsing (EPO)
- E17.048 ...Entity relationship models (EPO)
- E17.049 ...Physical indexing structures (EPO)
- E17.05Trees, e.g., B+ trees, etc. (EPO)
- E17.051Vectors, bitmaps or matrices (EPO)
- E17.052Hash tables (EPO)
- E17.053Index managing details (EPO)
- E17.054 ...Relational operators, e.g., joins, transitive closure, partitioning, etc. (EPO)
- E17.055 ..Object oriented databases (EPO)
- E17.056 ..Multidimensional databases (EPO)
- E17.057 ...Indexing (EPO)
- E17.058 .Of unstructured textual data (EPO)
- E17.059 ..Filtering based on additional data, e.g., user or group profiles, etc. (EPO)
- E17.06 ...Profile generation, learning or modification (EPO)
- E17.061 ..Querying (EPO)
- E17.062 ...Query formulation (EPO)
- E17.063Reformulation based on results of preceding query (EPO)
- E17.064Using relevance feedback from the user, e.g., relevance feedback on documents, documents sets, document terms or passages, etc. (EPO)
- E17.065Using graphical result space presentation or visualization (EPO)
- E17.066Using system suggestions (EPO)
- E17.067Using document space presentation or visualization, e.g., category, hierarchy or range presentation and selection, etc. (EPO)
- E17.068Natural language query formulation or dialogue systems (EPO)
- E17.069 ...Query processing (EPO)
- E17.07Query translation (EPO)
- E17.071Selection or weighting of terms from queries, including natural language queries (EPO)
- E17.072Syntactic pre-processing steps, e.g., stopword elimination, stemming, etc. (EPO)
- E17.073Translation of the query language, e.g., Chinese to English, etc. (EPO)
- E17.074Query expansion (EPO)
- E17.075Query execution (EPO)
- E17.076Using Boolean model (EPO)
- E17.077Using phonetics (EPO)
- E17.078Using natural language analysis (EPO)
- E17.079Using probabilistic model (EPO)
- E17.08Using vector based model (EPO)
- E17.081Reuse of stored results of previous queries (EPO)
- E17.082 ...Presentation or visualization of query results (EPO)
- E17.083 ..Indexing (EPO)
- E17.084 ...Selection or weighting of terms for indexing (EPO)
- E17.085 ...Physical indexing structures (EPO)
- E17.086Inverted lists (EPO)
- E17.087Trees (EPO)
- E17.088Index managing details (EPO)
- E17.089 ..Clustering or classification (EPO)
- E17.09 ...Into predefined classes (EPO)
- E17.091 ...Including class or cluster creation or modification (EPO)
- E17.092 ...Including cluster or class visualization or browsing (EPO)
- E17.093 ..Browsing or visualization (EPO).
- E17.094 ...Summarization for human users (EPO)
- E17.095 ..Based on associated metadata or manual classification, e.g., bibliographic data, etc. (EPO)
- E17.096 ...Using identifiers, e.g., barcodes, radio frequency identifications, etc. (EPO)
- E17.097 ...Using citations (EPO)
- E17.098 ..Creation of semantic tools (EPO)
- E17.099 ...Ontology (EPO)
- E17.1 ...Thesaurus (EPO)

- E17.101 .Of audio data (EPO)
 E17.102 ..Based on associated metadata, e.g., bibliographic data, images associated with audio data, etc. (EPO)
 E17.103 ...Wherein the metadata is a transcript of the audio data (EPO)
 E17.104 ..Processing sequentially ordered data, e.g., alpha-numerically ordered, etc. (EPO)
 E17.105 ..Binary access (EPO)
 E17.106 ..Sequential access (EPO)
 E17.107 ..Retrieval from the Internet, e.g., browsers, etc. (EPO)
 E17.108 ..By querying, e.g., search engines or meta-search engines, crawling techniques, push systems, etc. (EPO)
 E17.109 ...With filtering and personalization (EPO)
 E17.11 ..Spatially dependent indexing and retrieval, e.g., location dependent results to queries, etc. (EPO)
 E17.111 ..By navigation, e.g., using categorized browsing, portals, synchronized browsing, visual networks of documents, virtual worlds or tours, etc. (EPO)
 E17.112 ..By using information identifiers, e.g., encoding URL in specific indicia, browsing history, etc. (EPO)
 E17.113 ...By using bar codes (EPO)
 E17.114 ..Bookmark management (EPO)
 E17.115 ..URL specific, e.g., using aliases, detecting broken or misspelled links, etc. (EPO)
 E17.116 ..Web site content organization and management, e.g., publishing, automatic linking or maintaining pages, etc. (EPO)
 E17.117 ...Access to data in other repository systems, e.g., legacy data or dynamic web page generation, etc. (EPO)
 E17.118 ...Document structures and storage, e.g., HTML extensions, etc. (EPO)
 E17.119 ..Browsing optimization (EPO)
 E17.12 ..Of access to content, e.g., by caching, etc. (EPO)
 E17.121 ...Optimizing the visualization of content, e.g., distillation of HTML documents, etc. (EPO)
 E17.122 .Of semistructured data, the underlying structure being taken into account, e.g., mark-up language structure data, etc. (EPO)
 E17.123 ..Indexing, e.g., of XML tags, etc. (EPO)
 E17.124 ..Mapping or conversion (EPO)
 E17.125 ...Mapping to a database (EPO)
 E17.126 ...Mark-up to mark-up conversion (EPO)
 E17.127 ..XML native databases, structures and querying (EPO)
 E17.128 ...Query formulation (EPO)
 E17.129 ...Query processing (EPO)
 E17.13 ...Query translation (EPO)
 E17.131 ...Query optimization (EPO)
 E17.132 ...Query execution (EPO)
 E17.133 ...Results presentation (EPO)
 E17.134 .Details of database functions independent of the retrieved data type (EPO)
 E17.135 ..Querying (EPO)
 E17.136 ...Query formulation (EPO)
 E17.137 ...Using system suggestions (EPO)
 E17.138Using search space presentation or visualization, e.g., category or range presentation and selection, etc. (EPO)
 E17.139 ...Natural language query formulation or dialogue systems (EPO)
 E17.14 ...Query processing (EPO)
 E17.141 ...Presentation or visualization of query results (EPO)
 E17.142 ..Browsing or visualization (EPO)
 E17.143 ..Retrieval based on associated meditate (EPO)

CROSS-REFERENCE ART COLLECTIONS

- 912 **APPLICATIONS OF A DATABASE**
 913 ..Multimedia
 914 ..Video
 915 ..Image
 916 ..Audio
 917 ..Text
 918 ..Location
 919 ..Geographic
 920 ...Navigation

921	..Spatial	974	....Vertical partitioning
922	.Communications	975	.Portable database architecture
923	.Intellectual property	999.001	DATABASE OR FILE ACCESSING (707/1)
924	..Patent procedure	999.002	.Access augmentation or optimizing (707/2)
925	...Drafting an application	999.003	.Query processing (i.e., searching) (707/3)
926	...Drafting drawing or figures	999.004	..Query formulation, input preparation, or translation (707/4)
927	...Validation	999.005	..Query augmenting and refining (e.g., inexact access) (707/5)
928	...Electronic submission	999.006	..Pattern matching access (707/6)
929	...Docketing	999.007	.Sorting (707/7)
930	..Intellectual property analysis	999.008	.Concurrency (e.g., lock management in shared database) (707/8)
931	...Patent comparison	999.009	.Privileged access (707/9)
932	....Infringement detection	999.01	.Distributed or remote access (707/10)
933	...Citation analysis	999.1	DATABASE SCHEMA OR DATA STRUCTURE (707/100)
934	...Analyzing patent activity	999.101	.Manipulating data structure (e.g., compression, compaction, compilation) (707/101)
935	....Company or stock valuation	999.102	.Generating database or data structure (e.g., via user interface) (707/102)
936	..For use in research and development	999.103	.Object-oriented database structure (707/103R)
937	..Intellectual property searching	999.104	..Object-oriented database structure processing (707/103Y)
938	..Intellectual property markets	999.105	..Object-oriented database structure network (707/103X)
939	..Idea solicitation	999.106	..Object-oriented database structure reference (707/103Z)
940	.Infrastructure	999.107	.Application of database or data structure (e.g., distributed, multimedia, image) (707/104.1)
941	.Human sciences	999.2	FILE OR DATABASE MAINTENANCE (707/200)
942	.Legal/academic	999.201	.Coherency (e.g., same view to multiple users) (707/201)
943	.News	999.202	..Recoverability (707/202)
944	.Business related	999.203	..Version management (707/203)
945	..Contract negotiation	999.204	..Archiving or backup (707/204)
946	..Real estate	999.205	.File allocation (707/205)
947	..Human resources	999.206	..Garbage collection (707/206)
948	..Product or catalog		
949	..Inventory		
950	.Financial		
951	.Calendar or scheduling		
952	.Malicious software		
953	ORGANIZATION OF DATA		
954	.Relational		
955	.Object-oriented		
956	.Hierarchical		
957	.Multidimensional		
958	.Data cubes		
959	.Network		
960	.Object-relational		
961	.Associative		
962	.Entity-attribute-value		
963	.Hybrid		
964	DATABASE ARRANGEMENT		
965	.Standalone		
966	.Distributed		
967	..Peer-to-peer		
968	...Partitioning		
969	....Horizontal partitioning		
970Vertical partitioning		
971	..Federated		
972	...Partitioning		
973Horizontal partitioning		

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CLASS 707 DATA PROCESSING: DATABASE AND FILE MANAGEMENT OR DATA
STRUCTURES

FOREIGN ART COLLECTIONS

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS