Figure 17.1(a) Diagrams to illustrate different architectures. Physical centralized architecture.

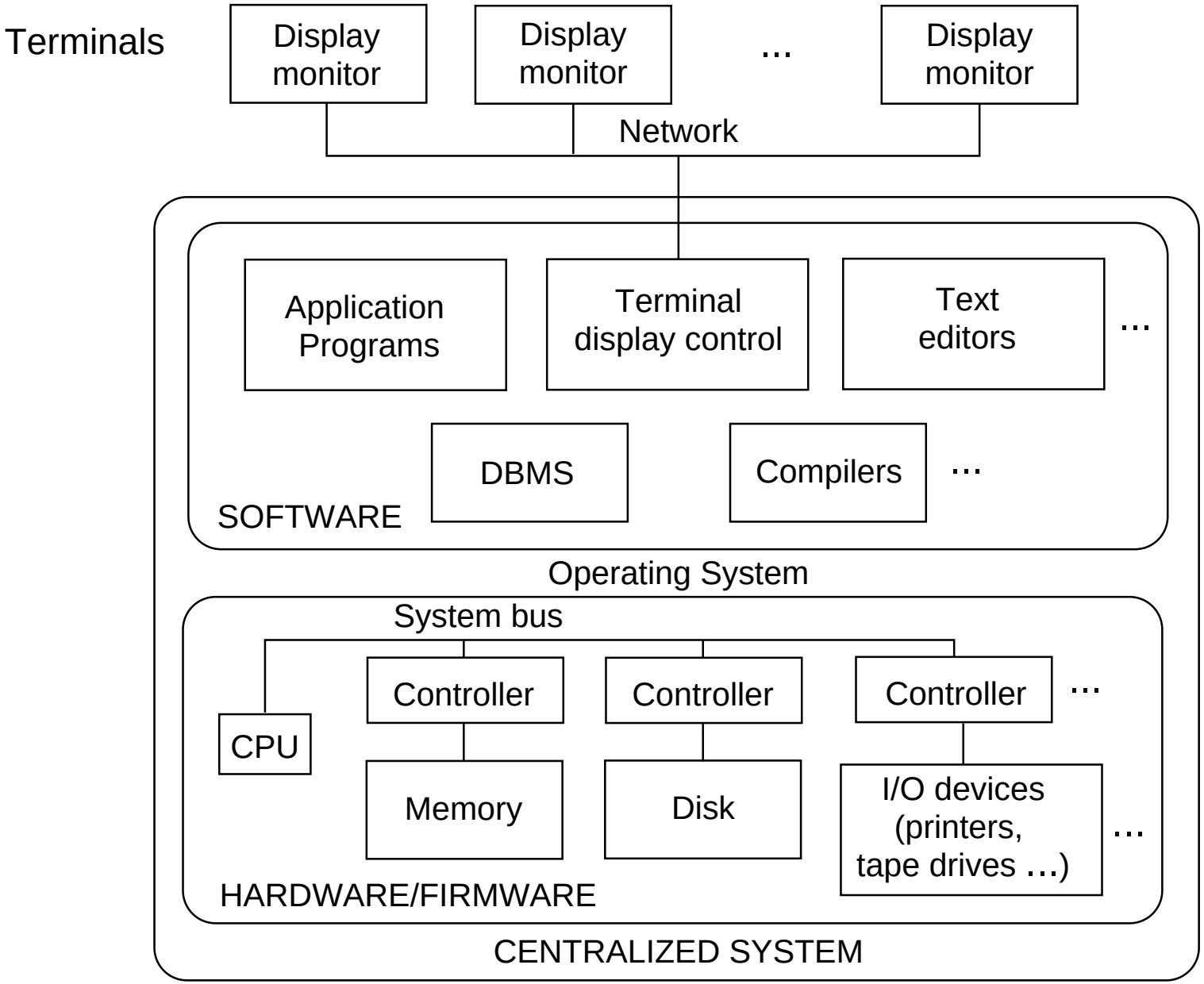

Figure 17.1(b) Diagrams to illustrate different architectures. Simplified logical client-server architecture.

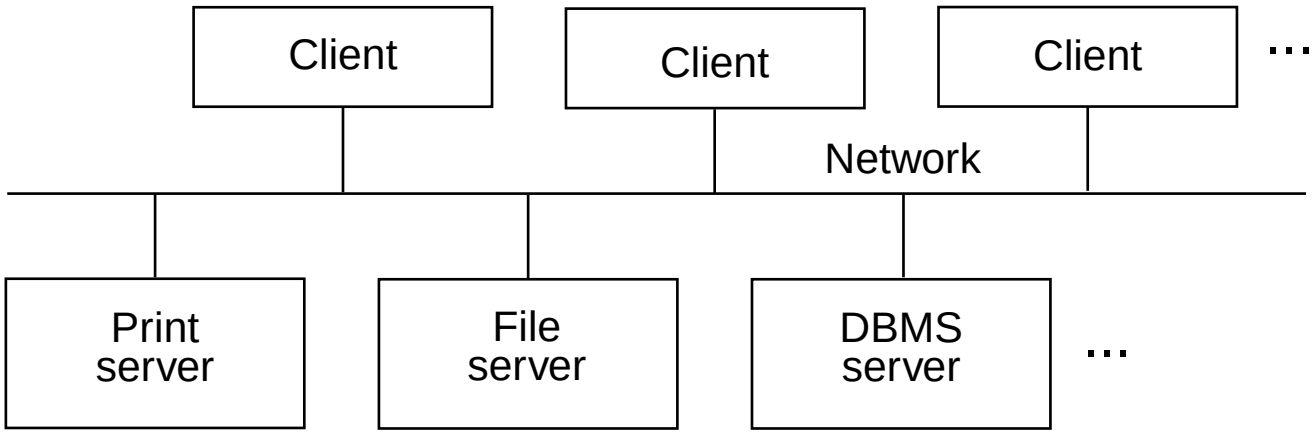

Figure 17.1(c) Diagrams to illustrate different architectures. Simplified physical client-server architecture.

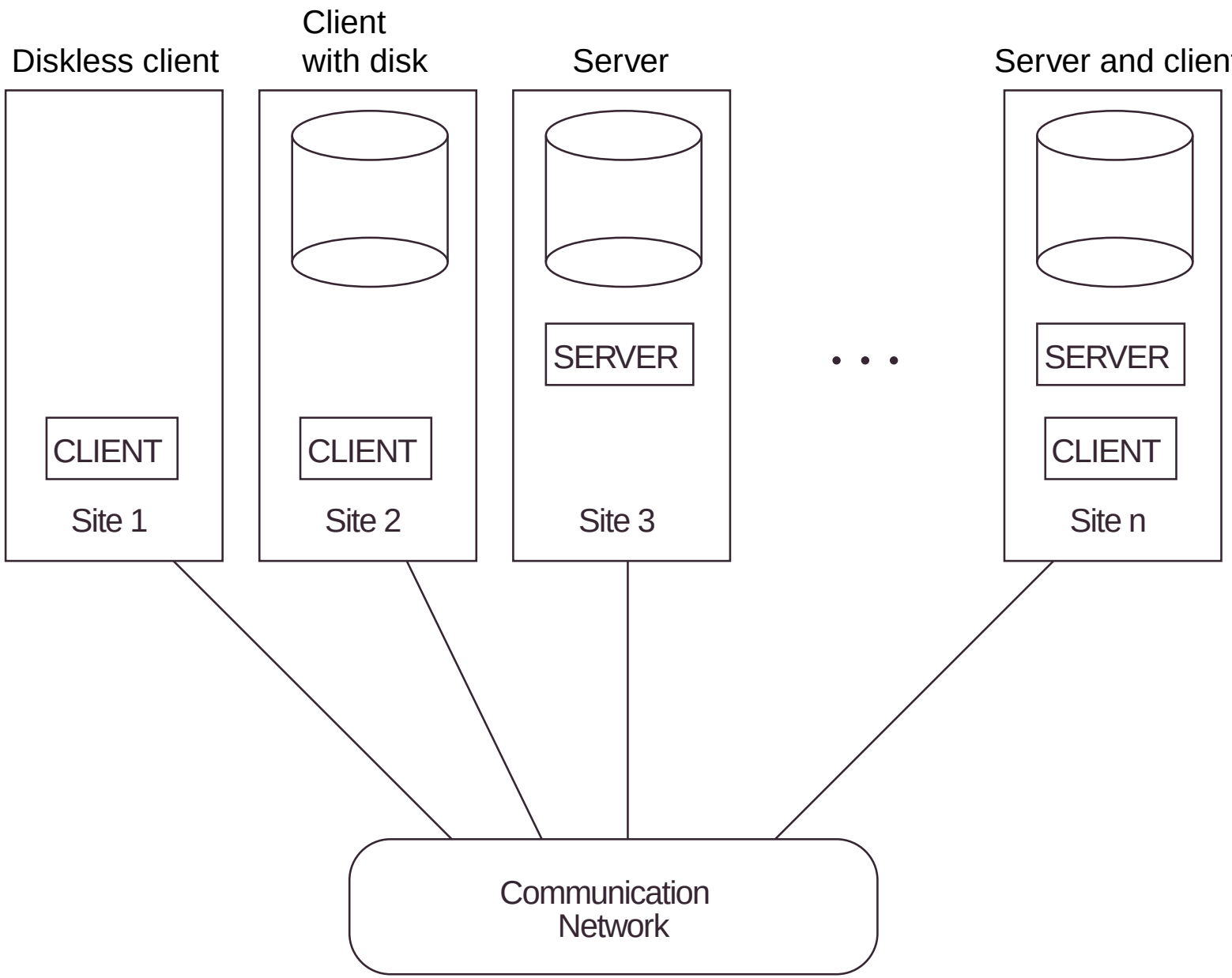

Figure 17.2 Basic catalog relation to describe the relation schemas in Figure 7.5.

REL_AND_ATTR_CATALOG

REL_NAME	ATTR_NAME	ATTR_TYPE	MEMBER_OF_PK	MEMBER_OF_FK	FK_RELATION
EMPLOYEE	FNAME	VSTR15	no	no	
EMPLOYEE	MINIT	CHAR	no	no	
EMPLOYEE	LNAME	VSTR15	no	no	
EMPLOYEE	SSN	STR9	yes	no	
EMPLOYEE	BDATE	STR9	no	no	
EMPLOYEE	ADDRESS	VSTR30	no	no	
EMPLOYEE	SEX	CHAR	no	no	
EMPLOYEE	SALARY	INTEGER	no	no	
EMPLOYEE	SUPERSSN	STR9	no	yes	EMPLOYEE
EMPLOYEE	DNO	INTEGER	no	yes	DEPARTMENT
DEPARTMENT	DNAME	VSTR10	no	no	
DEPARTMENT	DNUMBER	INTEGER	yes	no	
DEPARTMENT	MGRSSN	STR9	no	yes	EMPLOYEE
DEPARTMENT	MGRSTARTDATE	STR10	no	no	
DEPT_LOCATIONS	DNUMBER	INTEGER	yes	yes	DEPARTMENT
DEPT_LOCATIONS	DLOCATION	VSTR15	yes	no	
PROJECT	PNAME	VSTR10	no	no	
PROJECT	PNUMBER	INTEGER	yes	no	
PROJECT	PLOCATION	VSTR15	no	no	
PROJECT	DNO	INTEGER	no	yes	DEPARTMENT
WORKS_ON	ESSN	STR9	yes	yes	EMPLOYEE
WORKS_ON	PNO	INTEGER	yes	yes	PROJECT
WORKS_ON	HOURS	REAL	no	no	
DEPENDENT	ESSN	STR9	yes	yes	EMPLOYEE
DEPENDENT	DEPENDENT_NAME	VSTR15	yes	no	
DEPENDENT	SEX	CHAR	no	no	
DEPENDENT	BDATE	STR9	no	no	

Figure 17.3 Other possible catalog relations for a relational system.
(a) Possible catalog relation for storing general key information.
(b) Possible catalog relation for storing index information.
(c) Possible catalog relations for storing view information.

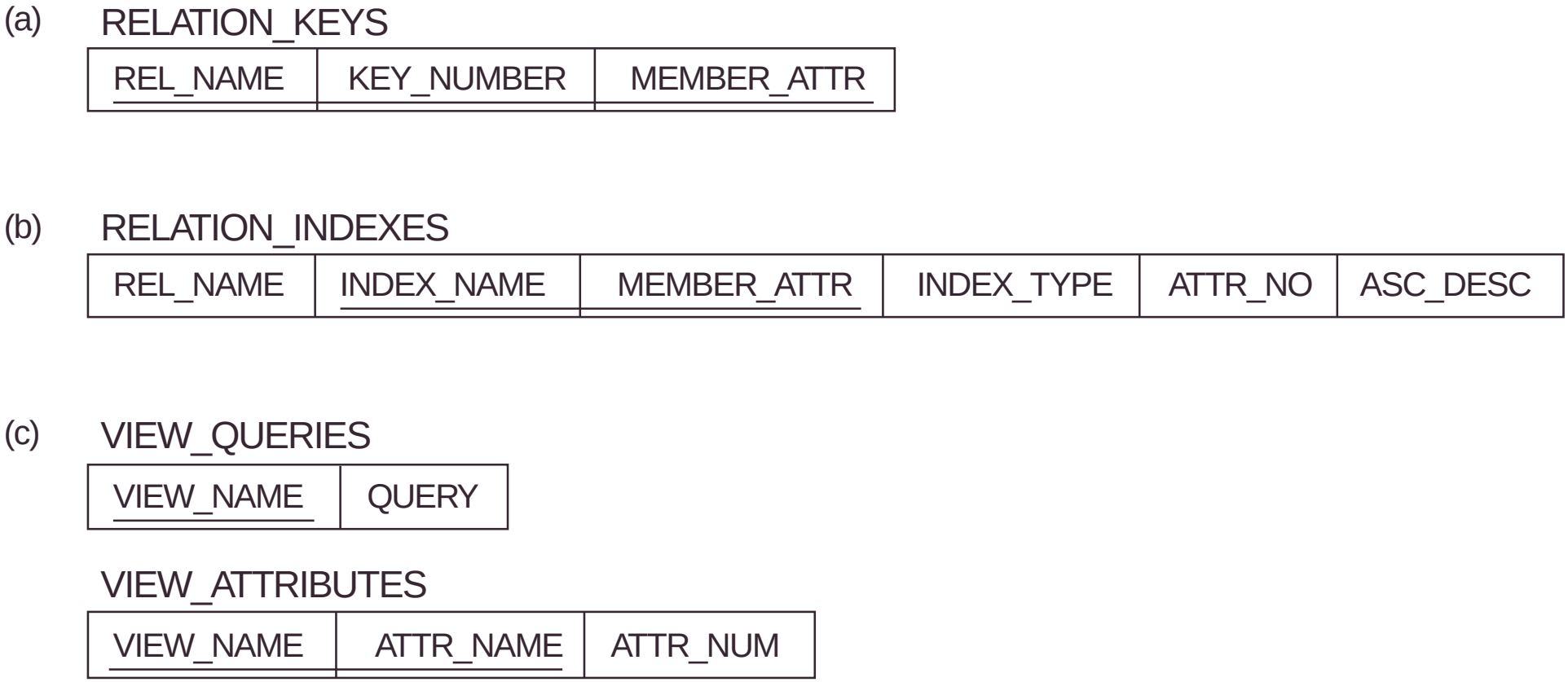

Figure 17.4 An example of an enhanced-ER (EER) diagram for part of a relational catalog.

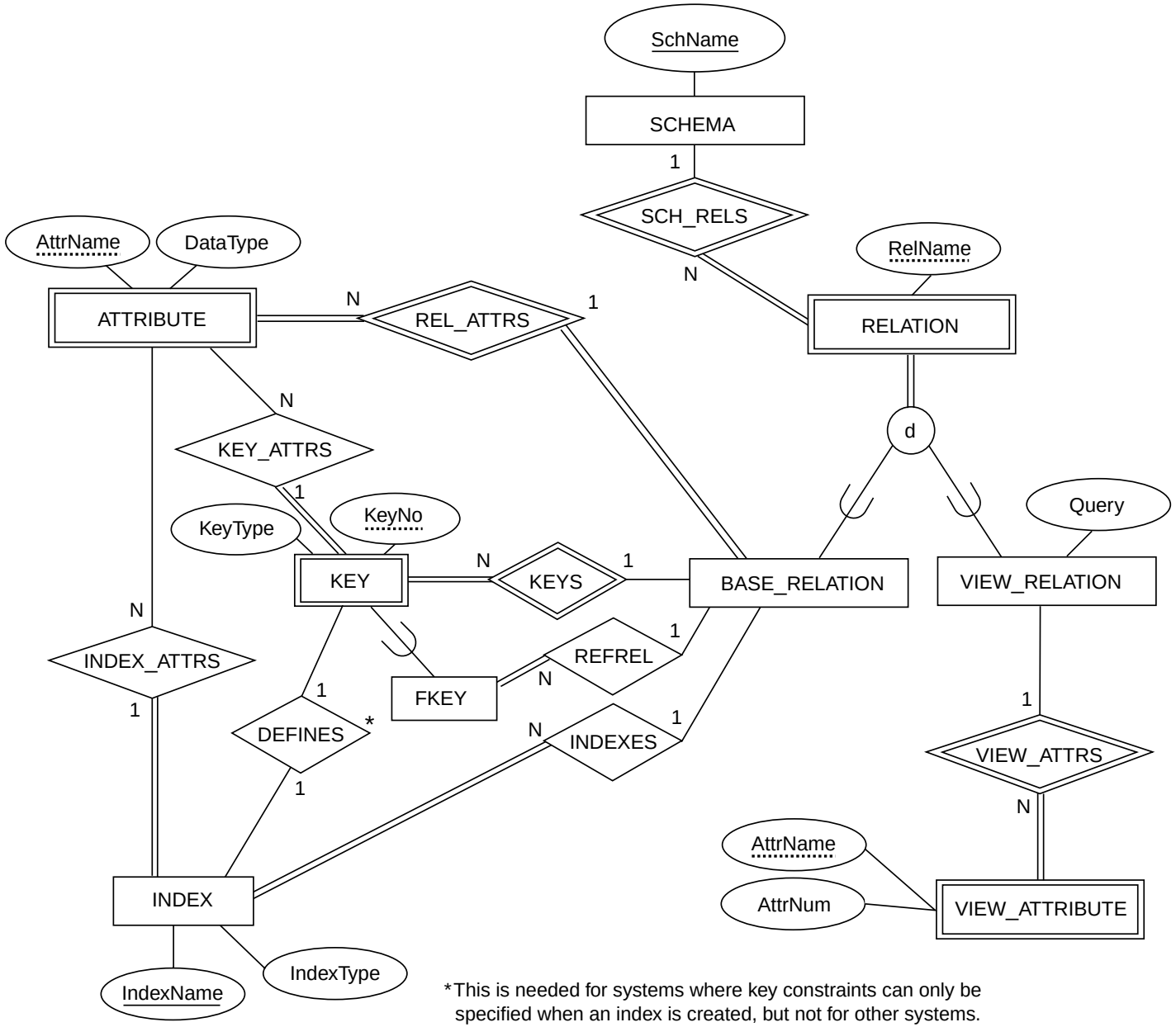

Figure 17.5 The result of querying ALL_CATALOG.

OWNER	TABLE_NAME	TABLE_TYPE
SMITH	ACCOUNT	TABLE
SMITH	CUSTOMERS	TABLE
SMITH	CUSTORDER	VIEW
SMITH	ORDERS	TABLE

Figure 17.6 The result of querying USER_TAB_COLUMNS.

COLUMN_NAME	DATA_TYPE	DATA_LENGTH	NUM_DISTINCT	LOW_VALUE	HIGH_VALUE
ORDERNO	NUMBER	22	4	C102	C105
CUSTNO	NUMBER	22	3	C102	C106
ORDERDATE	DATE	7	4	77BF0A1E010101	77BF0B06010101

Figure 17.7 Result of querying USER_TABLES.

PCT_FREE	INITIAL_EXTENT	NUM_ROWS	BLOCKS	EMPTY_BLOCKS	AVG_ROW_LENGTH
10	10240	4	1	3	17

Figure 17.8 The result of querying USER_INDEXES.

INDEX_NAME	UNIQUENESS	BLEVEL	LEAF_ BLOCKS	DISTINCT_ KEYS	AVG_LEAF_ BLOCKS_ PER_KEY	AVG_DATA_ BLOCKS_ PER_KEY
ORD_CUSTNO	NONUNIQUE	0	1	3	1	1

Figure 17.9 The result of querying USER_VIEWS.

VIEW_NAME	TEXT_LENGTH	TEXT
CUSTORDER	101	select custname,city,orderno,orderdate from customers,orders where customers.custno=orders.custno;

Figure 17.10 Result of querying USER_TAB_COLUMNS about the CUSTORDER view.

COLUMN_NAME	DATA_TYPE	DATA_LENGTH
CITY	CHAR	20
ORDERNO	NUMBER	22
ORDERDATE	DATE	7
CUSTNAME	CHAR	20

Figure 17.11 Human and software interfaces to a data dictionary.