WBS-FOR CREATING AN ER-MODEL

- Let $A(E_i)$ = the set of attributes of entity-set an E_i.

- Let $A(R_j)$ = the set of attributes (if any) of a relationship-set R_j.

  - For an R_j, if a collection of entities, one from each E_i partici-pating in R_j, can interact multiple times, then we need a primary key among the attributes $A(R_j)$ to distinguish those interactions. (See below; entity-attributes are not shown.)

  - In that case, each link's cardinality-upper-bound > 1 or $= \infty$.

| PAWS-USERS | 0:∞ | VISITS (*StartTimeDate*, Duration) | 0:∞ | SELECTED-WEB-SITES |

A sample table for VISITS

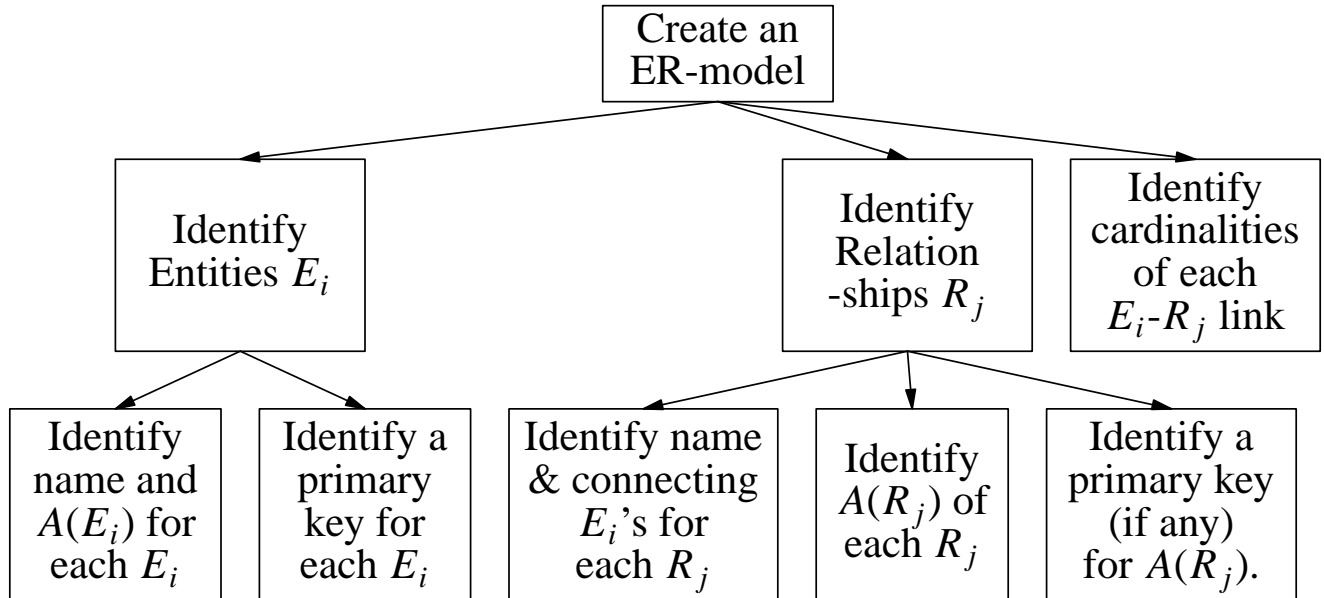| *PawsId*	*Web-URL*	*StartTimeDate*	Duration
124-12-1234	www.xyz.com	10:30:00+2011-Jan-01	2:30:10
124-12-1234	www.xyz.com	12:50:00+2011-Jan-01	1:30:30
234-55-2222	www.xyz.com	12:50:00+2011-Jan-01	2:00:10
234-55-2222	www.uvw.com	12:50:00+2011-Jan-01	0:30:20
234-55-2222	www.abc.com	10:30:00+2011-Feb-02	0:10:30
...	...	...	...

- The value of "Duration" in the VISITS-table is determined by the values of other three attributes; this kind of data-dependencies are called *functional dependencies* and are written as

$$\text{PawsId, Web-URL, StartTimeDate} \rightarrow \text{Duration}$$

Question:

- ? What do the rows 1 and 2 in the sample table illustrate (why did I include them)? How about the 2nd and 3rd rows?

- ? What problems would arise for VISIT-table if we did not know the keys of SELECTED-WEB-SITES and PAWS-USERS?

A WBS FOR CREATING ER-MODELS

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                        ┌─────────────┐
                        │  Create an  │
                        │  ER-model   │
                        └─────────────┘
        ┌───────────────────┐   ┌──────────────┐   ┌─────────────────┐
        │     Identify      │   │   Identify   │   │    Identify     │
        │   Entities $E_i$  │   │   Relation   │   │  cardinalities  │
        │                   │   │  -ships $R_j$│   │    of each      │
        └───────────────────┘   └──────────────┘   │ $E_i$-$R_j$ link│
                                                    └─────────────────┘
```

Identify name and $A(E_i)$ for each E_i	Identify a primary key for each E_i	Identify name & connecting E_i's for each R_j	Identify $A(R_j)$ of each R_j	Identify a primary key (if any) for $A(R_j)$.

Question:

•? State clearly how this WBS satisfies the property below (take the project to be "create an ER-model for an application").

> "each work-unit in a WBS for a project must relate to one or more data items relevant to the project and vice-versa."

•? What is a good reason for no further decomposition of the work-unit "Identify name and $A(E_i)$ for each E_i"?

•? Suppose someone applied the above WBS to create an ER-model for data related to the web-site-visits and came up with the ER-model shown on the previous page. Which work-unit in the WBS would have produced which part(s) of the ER-model?

•? In what way the above WBS is right or wrong?

•? Is there another WBS which is as good as or better than the one above for creating an ER-model? (Explain your answers.)