

Visio: Logical Database Model

CIS 3730

Designing and Managing Data

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Overview / Introduction

- ◆ Use Visio for logical database modeling

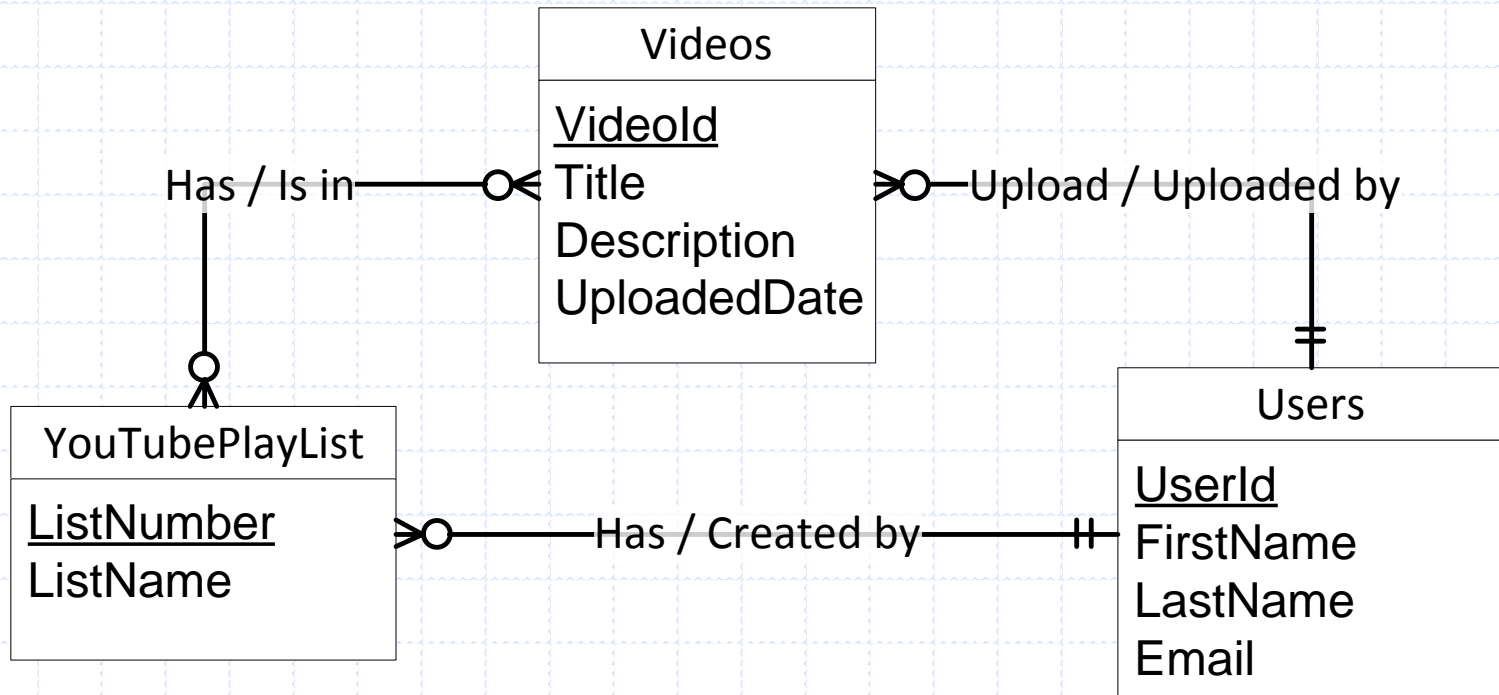
- ◆ **Note**

- The database model diagram template in Visio is really a logical database model (plus physical model), not really a conceptual ERD model

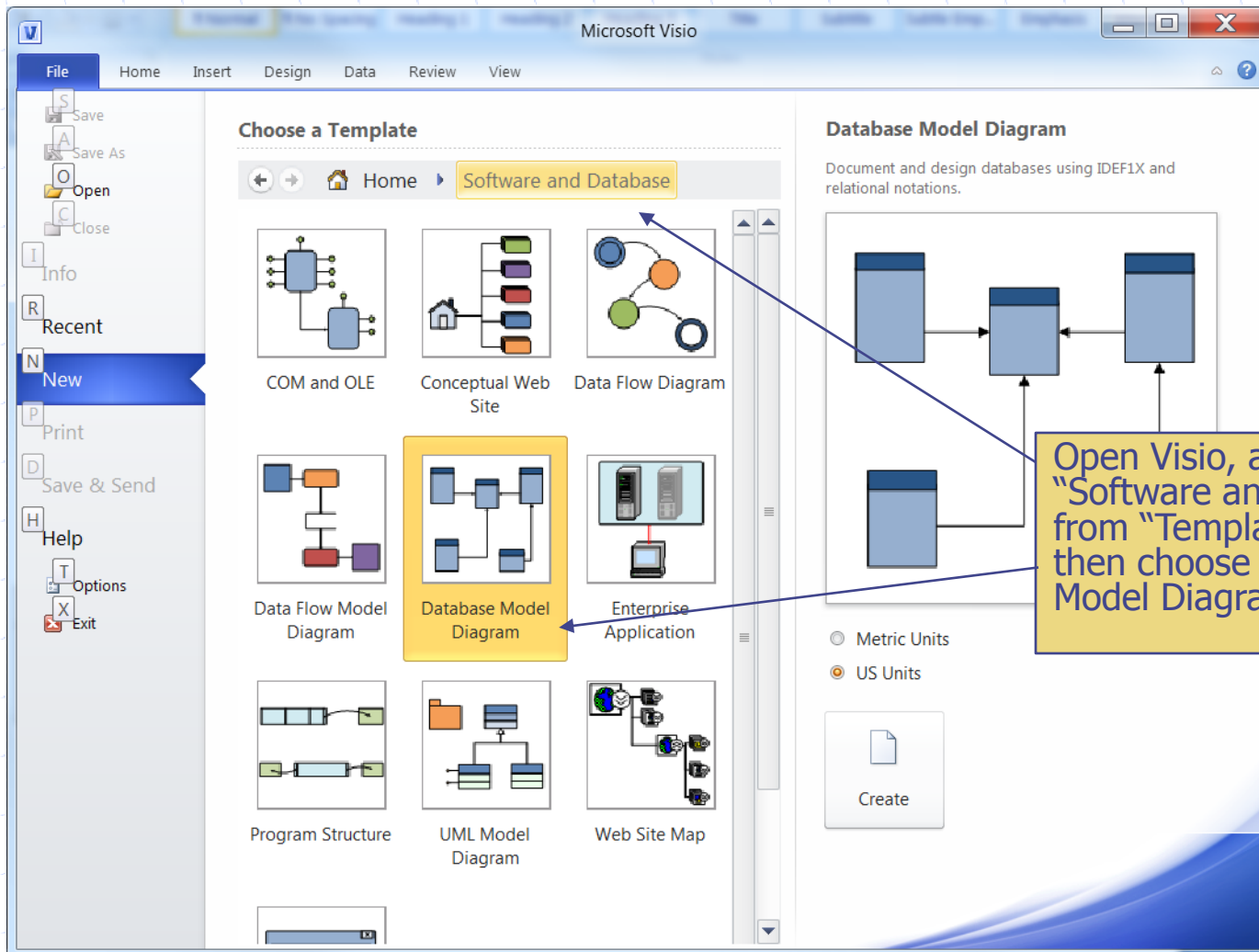
- ◆ Download examples

- <http://jackzheng.net/teaching/cis3730/>

Starting from an ERD Example



Open Visio 2010



Open Visio, and choose "Software and Database" from "Template Categories", then choose "Database Model Diagram"

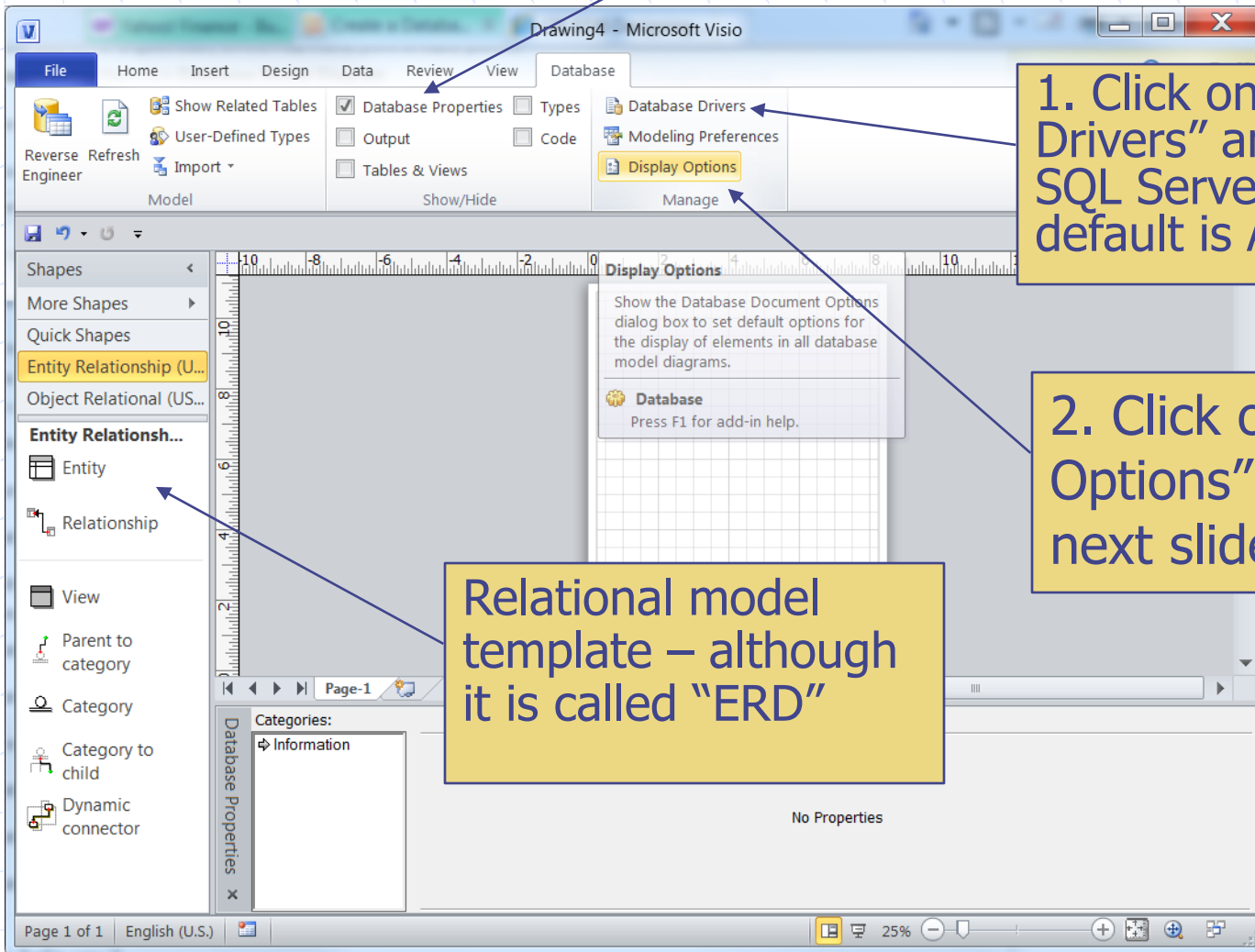
Settings First

Make this "Database Properties" is checked

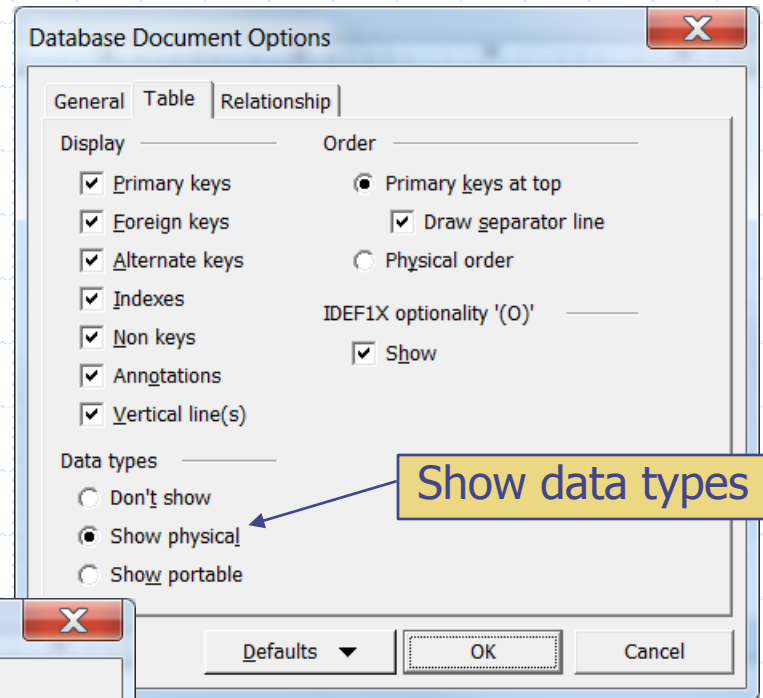
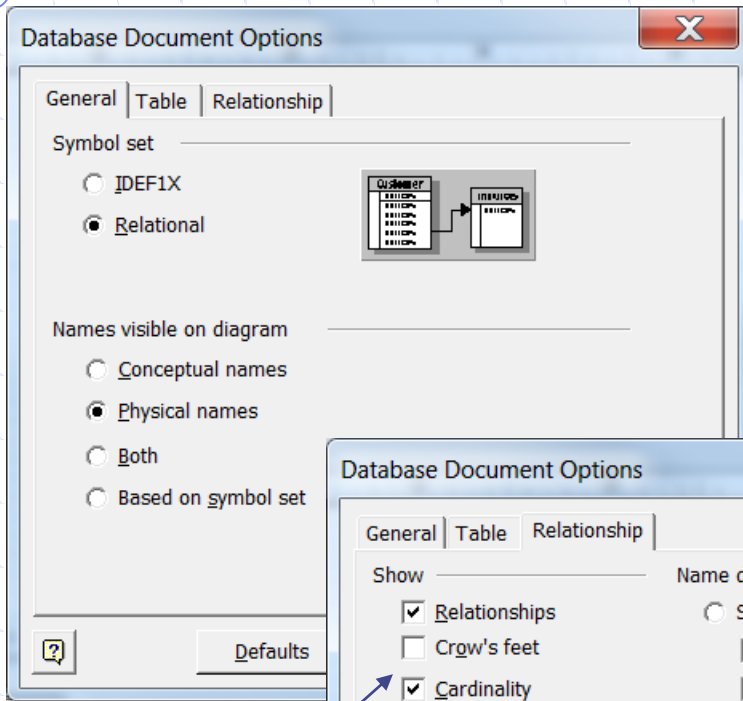
1. Click on "Database Drivers" and select SQL Server. The default is Access.

2. Click on "Display Options" and see next slide

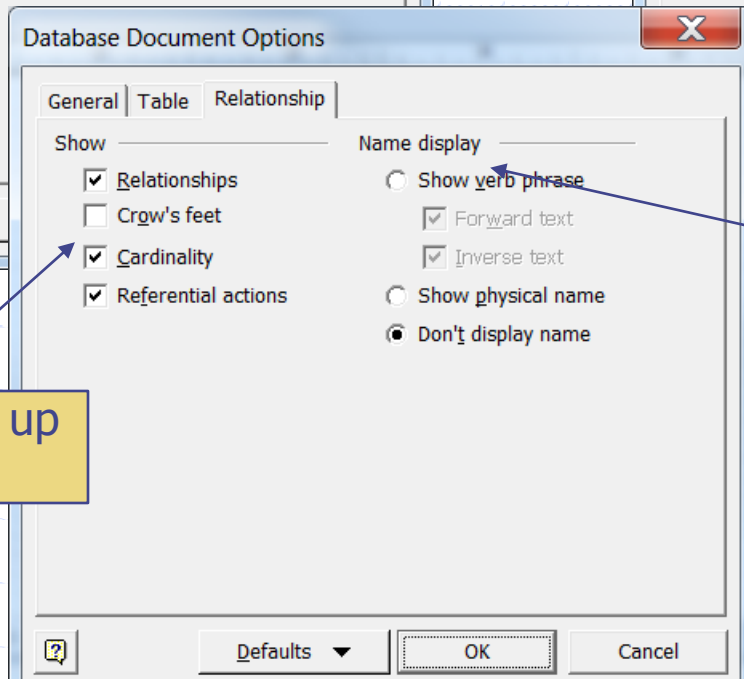
Relational model template – although it is called "ERD"



Display Options



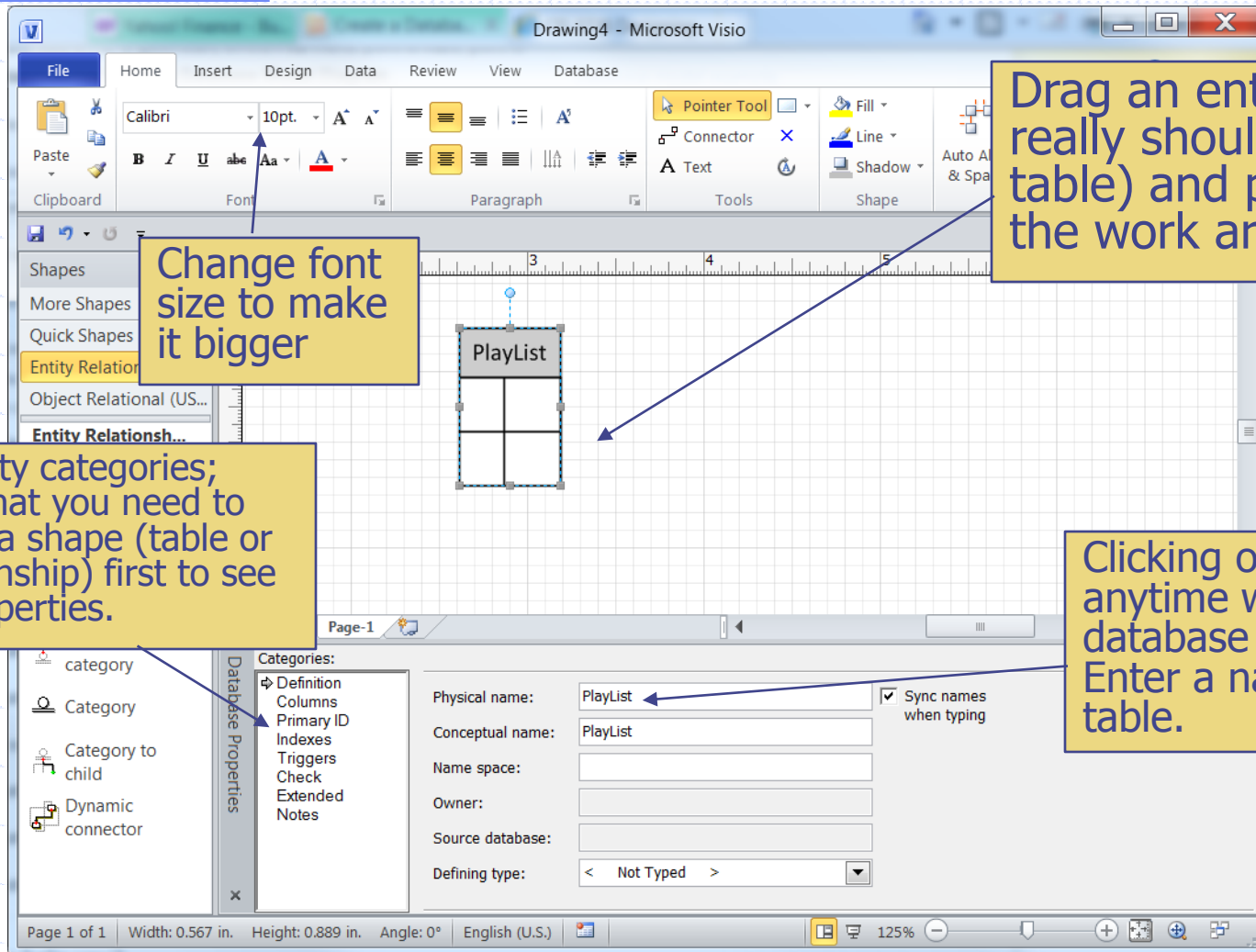
Show data types



Again, up to you.

"Crow's feet" is up to you.

Create the First Table



Change font size to make it bigger

Drag an entity (it really should be a table) and place it on the work area.

Property categories; note that you need to select a shape (table or relationship) first to see its properties.

Clicking on the table anytime will bring up this database property panel. Enter a name for the table.

Defining Columns

The screenshot shows the Microsoft Visio interface with the Database Properties panel open. The panel displays the definition of a table named 'Playlist'. The table has two columns: 'ListNumber' (int, PK, required) and 'ListName' (char(10), not required). The 'ListNumber' column is identified as the primary key, and 'ListName' is identified as a foreign key to 'ListNumber' in the same table. The 'Database Properties' panel is set to 'Physical data type' for 'Microsoft SQL Server'.

No direct editing in the shape. Use "database properties" panel

Continue to create other 2 tables directly transformed from entities.

Enter name, choose data type, required or not, primary key (PK) here based on the transformation guidelines; double-click a data type to edit column size.

Advanced properties for columns

Zooming

Physical Name	Data Type	Req'd	PK	Notes
ListNumber	int	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ListNumber identifies Playlist
ListName	char(10)	<input type="checkbox"/>	<input type="checkbox"/>	ListName is of Playlist

Page 1 of 1 Width: 1.763 in. Height: 0.889 in. Angle: 0° English (U.S.) 125%

Defining Relationships

The FK column is automatically added by Visio. Sometimes you have another same column already. Just delete one which is not assigned as FK.

Drag a relationship shape from the template. Connect the arrow end to the "one" side, and the other end to the "many" side. When the red border appears, it's connected.

Visio will automatically detect the PK/FK pair. If not correct, click on the relationship and change it here.

Entity Relationships

- Entity
- Relationship
- View
- Parent to category
- Category
- Category to child
- Dynamic connector

Database Properties

Categories:

- Definition
- Name
- Miscellaneous
- Referential Action

Parent: Users

Child: PlayList

Foreign key role name:

Videos	
PK	VideoId char(10)
	Title char(100)
	Description nvarchar(500)
	UploadDate datetime

Users	
PK	UserId char(10)
	FirstName nvarchar(20)
	LastName nvarchar(20)
	Email nvarchar(50)

PlayList	
PK	ListNumber int
	ListName char(10)
FK1	UserId char(10)

Cardinality

Make sure the cardinality is consistent with the ERD (cardinality on the many side, or the foreign key side table).

This will change the PK. Be careful. Use "Non-identifying" usually.

PK	<u>Videoid</u>	char(10)
	Title	char(100)
	Description	nvarchar(500)
	UploadDate	datetime

PK	<u>UserId</u>	char(10)
	FirstName	nvarchar(20)
	LastName	nvarchar(20)
	Email	nvarchar(50)

PK	<u>ListNumber</u>	int
FK1	ListName	char(10)
	UserId	char(10)

Relationship: PlayList (*) to Users (1) (u:C d:C)

Database Properties: Cardinality: Zero or more, One or more, Zero or one, Exactly one, Range: At least: [] Relationship type: Identifying, Non-identifying Child has parent: Optional Parent-to-child relationship is: 0 or 1 to 0 or more

Referential Actions

The screenshot shows Microsoft Visio's interface for creating a database diagram. The main diagram features three entities: **Playlist**, **Videos**, and **Users**. **Playlist** has a primary key **ListNumber** (int) and a foreign key **UserId** (char(10)) that references the **Users** entity. **Videos** has a primary key **VideoId** (char(10)) and a foreign key **UserId** (char(10)) that also references the **Users** entity. The **Users** entity has primary keys **FirstName** (nvarchar(20)) and **LastName** (nvarchar(20)).

The **Database Properties** window is open, showing the **Referential Action** tab. It displays options for **On parent update** and **On parent delete**. The **On parent delete** options are: Cascade, No action, Set NULL, Set default, and Do not enforce. The **On parent update** options are: No action, Cascade, Set NULL, Set default, and Do not enforce.

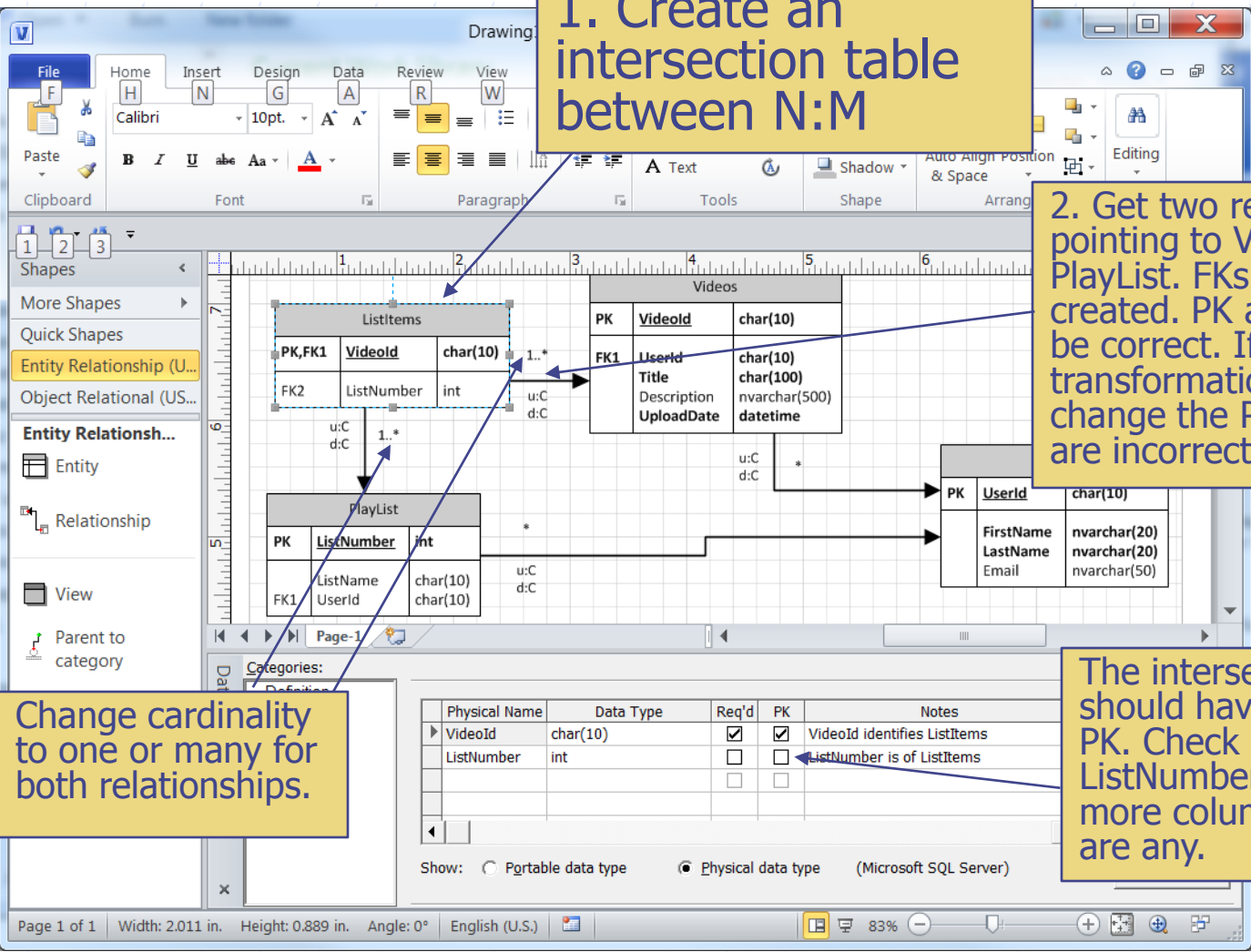
Three callout boxes provide additional information:

- Referential action notations.** (Points to the relationship lines between entities)
- Create another relationship between Videos and users.** (Points to the relationship between Videos and Users)
- Some choices will be disabled if not applicable. For example, if FK required=yes, then "SET NULL" will be disabled.** (Points to the disabled "Set NULL" option in the Database Properties window)

Transforming N:M Relationship

1. Create an intersection table between N:M

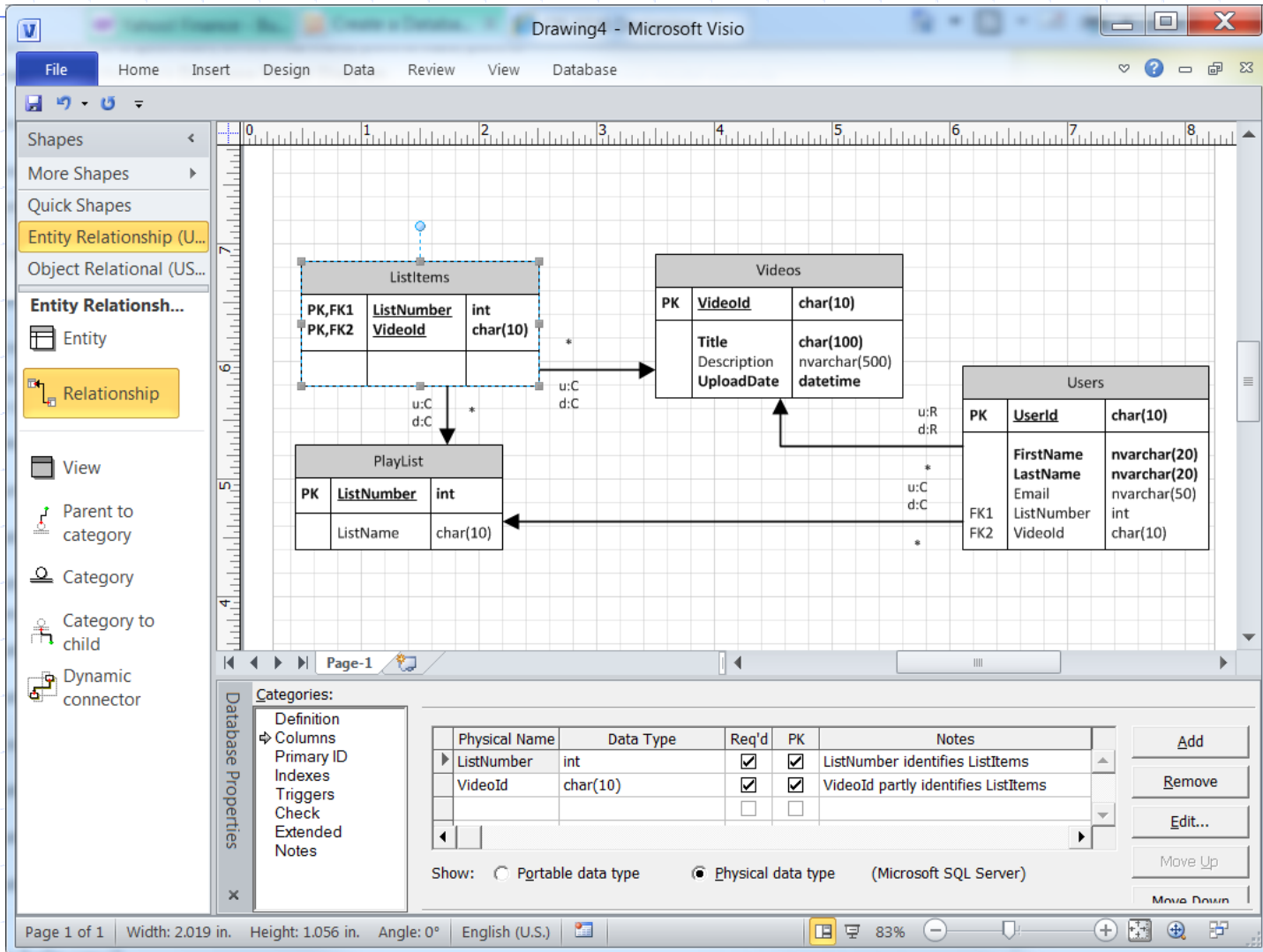
2. Get two relationship lines pointing to Videos and PlayList. FKs are automatically created. PK and FK may not be correct. If so, follow transformation guidelines to change the PK or FK if they are incorrect.



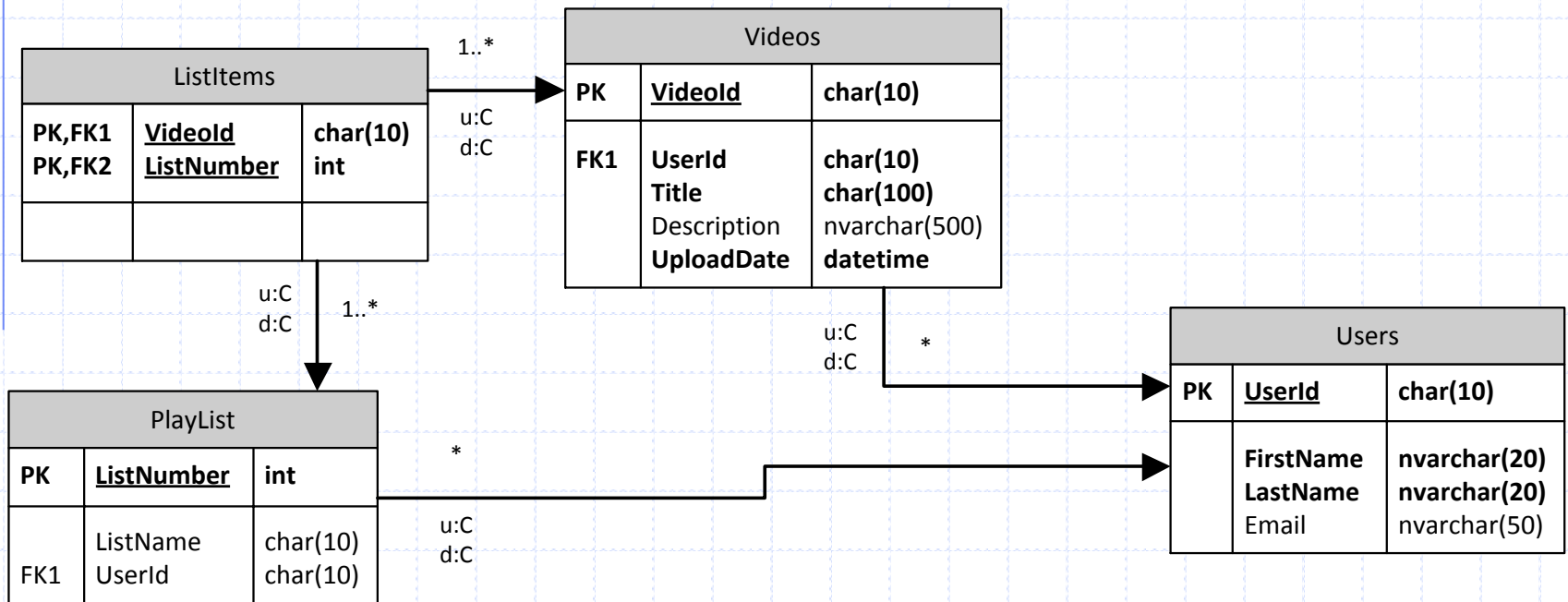
Change cardinality to one or many for both relationships.

The intersection table should have a composite PK. Check PK for ListNumber as well. Add more columns if there are any.

Completed



Final Design in Visio



Additional Tutorials

◆ Create a database model

- <http://office.microsoft.com/en-us/visio-help/create-a-database-model-also-known-as-entity-relationship-diagram-HA010115477.aspx>
- Check out section 1 (should be 0, "create a new model diagram from scratch") and 1

◆ Database Concepts 5th edition Online Appendix D

- <http://www.pearsonhighered.com/kroenke>

◆ Visio 2007 video tutorial (there are three parts)

- <http://www.youtube.com/watch?v=1BYt3wmkgXE>