



How to Keep ERD and Data Dictionary Synchronized?

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Data modeling is often the first step in database design as the developers will typically create a conceptual model of how data items relate to each other. Data modeling involves a progression from conceptual model to logical model to physical schema. While a conceptual or logical Entity Relationship Diagram (ERD) will focus on the high-level business concepts, a Data Dictionary will provide more detail about a business concept, such as standard definitions of data elements, their meanings, and allowable values.

What is Data Modeling?

Data modeling is the process of representing data objects and their relationships to other objects. Data modeling is performed to define data requirements of an information system in supporting business processes.

What is Data Dictionary?

Data dictionary is the textual description of data objects and their inter-relationships. It is commonly used in confirming data requirements and for database developers to create and maintain a database system. A data dictionary describes the physical attributes of a data element. What is the data type (string, boolean, integer, etc.)? What is the maximum length? What is the format?

What is this Tutorial about?

This is data modeling tutorial written to outline the steps you need to take to perform data modeling and producing data dictionary in Visual Paradigm.

Preparation

In order complete this tutorial, make sure you have Visual Paradigm downloaded and installed. [Click here to download Visual Paradigm](#) if you do not have it installed.

Part I - Data Modeling

In this section, we are going to use the ERD tools to create a simple database design.

1. Create a new project in Visual Paradigm. You can create project by selecting **File > New Project** from the main menu.
2. To create an Entity Relationship Diagram, select **Diagram > New** from the toolbar.

3. In the **New Diagram** window, select **Entity Relationship Diagram** and click **Next**. Give the diagram a name and click **OK** to confirm.
4. Draw a *Company* entity. To draw an entity, select **Entity** from the diagram toolbar (on the left hand side of the diagram) and click on the blank area of the ERD to create one.
5. Right-click on the *Company* entity and select **New Column** from the popup menu.
6. Enter + *ID : integer*. "+" stands for a primary key, while *ID* is the name of the column and *integer* is its type.
7. Press **Enter** and create another column *name : varchar(255)*. This column is not a primary key so you don't need to add "+" before it. It's a *varchar*, with *255* as type length.
8. Press **Enter** to confirm editing.
9. Press **Esc** to complete column creation.
10. Let's create one more entity. Move your mouse pointer over the *Company* entity. Press on the **Resource Catalog** icon at top right and drag it out.
11. Release the mouse button at the empty space on the right hand side. Select **One-to-Many Relationship -> Entity** from the Resource Catalog.
12. Enter *Employee* as entity name.
13. Right-click on the *Employee* entity and select **New Column** from the popup menu.
14. Again, enter +*ID : integer* to create a primary key for this entity.
15. Press **Enter** and create another column *name : varchar(255)*.
16. Press **Enter** and create another column *jobtitle : varchar(50)*.

17. Press **Enter** to confirm editing.
18. Press **Esc** to complete column creation.

19. Let's describe the entities and columns in detail. Open the **Description Pane** by clicking on **Show Description** button at the bottom right of the application window.

20. Click on the *Company* entity and enter its description: A company is a business unit that provides good or service.

21. Similarly, click on *Employee* and enter its description: An employee is someone who work in a company.
22. Repeat the steps for columns in *Company* entity:
ID - For the unique identification of company records.
name - Name of the company.

23. Repeat the steps for columns in *Employee* entity:
ID - For the unique identification of employee records.
name - Name of the employee.
jobtitle - The position of the employee in a company.

Part II - Producing Data Dictionary

Time to produce a data dictionary! There are several reporting tools you can select in producing a data dictionary. In this tutorial, let's try Doc. Composer.

1. Select **Tools > Doc. Composer** from the toolbar.
2. Select **Build Doc from Scratch** in Doc. Composer.

3. This creates an empty report. What you have to do is to fill it up with contents. In this tutorial, the data dictionary. Now, click on the ERD listed under the **Diagram Navigator**.

4. The **Template Pane** (at bottom left of the application window) lists the available templates of ERD. Select **Data Dictionary** and drag it to the document.

5. Release your mouse button to produce the content of data dictionary.

6. Are you happy with the content? Let's try something different. Create a new document. Again, select **Tools > Doc. Composer** from the toolbar and then select **Build Doc from Scratch** in Doc. Composer.
7. Click on the ERD listed under the **Diagram Navigator**.
8. This time, select **Basic** template and drag it onto the document.

9. Select the **Data Dictionary 2** template and drag it onto the document, under the ERD image.

10. Let's change the pages to show in landscape. Click on **Document Properties...** in the toolbar.

11. In the **Document Properties** window, open the **Page Setup** tab.
12. Select **Landscape** for **Page Orientation**.

13. Click **OK** to return to Doc. Composer. Look pretty nice now?
14. Now, let's produce a Word document from Doc. Composer. Click on the **Export** button at the top right corner of Doc. Composer, and then select **Word Document...** from the popup menu.

15. In the **Export Word Doc.** window, specify the output path of the Word file and click **Export**.

You now got a Word document of your data dictionary. In practice, you can send this to your client, the database administrator or anyone who need to refer to it.

Part III - Keeping Data Dictionary Up-to-Date

One of the most important, and yet challenging part of documenting a design is to keep the document up-to-date, showing the latest changes made in the design. Imagine if you have added more entities in ERD, or have updated the definition of some entities, you probably need to update the data dictionary to reflect the latest changes. The Doc. Composer provides you a 'refresh' function to accomplish this. Let's try it.

1. Open your ERD.

2. Add an entity *Project* from the *Employee* entity, with a One-to-Many relationship in between.
3. Now, go back to your document with data dictionary.
On top of the document there is a toolbar. Click on the **Refresh** button.
4. You should see the document content updated by showing the new entity in image.

So now, you can export an updated data dictionary, and send it to anyone who need it. :-)

Resources

1. [Company-and-Employee-ERD.vpp](#)
2. [sample-data-dictionary.docx](#)

Related Links

- [User's Guide - Drawing entity relationship diagram](#)
- [User's Guide - Developing a report in Report Composer](#)
- [Tutorial - How to Customize Element Templates in Doc. Composer?](#)
- [What is Entity Relationship Diagram \(ERD\)?](#)



Visual Paradigm home page
(<https://www.visual-paradigm.com/>)

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