# Video transcript

**Video 3.1: Reading and constructing a data flow diagram**

In this series of videos, we will be looking at three different techniques for defining or designing systems using diagrams. First, we are looking at data flow diagrams. In subsequent videos we   
will look at flowcharts and system diagrams, which are all used for slightly different purposes.

Data flow diagrams are often abbreviated to DFDs.

They are used to model or define the data that flows in and out of a system as inputs and outputs.

The data flow runs between the system and what are called external entities. These are not part   
of the system itself: they can be people like customers or employees or other organisations like   
a bank or a supplier. Data cannot flow directly between the external entities, it must flow through the system.

Drawing a DFD is actually a progressive technique with several drawings made, each one adding more detail to the previous one.

The first drawing is known as a top level or level 0 DFD. There are other levels such as level 1 and level 2 but we don’t need to worry about those, we are just concerned with level 0 DFDs.

Let’s have a go at drawing a level 0 DFD for a simple scenario.

This is based on an app called Qber, which allows people who want a taxi ride to request one using the app.

The app finds the nearest driver and sends instructions to them, the driver acknowledges they have accepted the request and are on their way to pick up the customer.

Once the driver is on their way to pick up the customer, the app notifies the customer.

The first step in drawing a level 0 DFD is to draw a box in the middle. This represents the system, which in this case is the Qber app which accepts data input and provides data output. With the level 0 DFD you don’t need to worry about how the system does any processing. The second step is to decide on what the external entities are for the system. They interact with the system by sending input to it or accepting output from it.

In the Qber app the external entities are the customers and the taxi drivers. External entities are drawn using an oval shape around the system box, but remember to leave a gap as we need to draw something between the system box and the external entities. Write the name of the external entity inside the oval.

The final stage is to add arrows which show how data flows to or from the external entities. Input data should have an arrow pointing into the system, output data should have an arrow pointing into the external entity. Every arrow should have a brief description of the data flow written next to it.

The first data flow we will add is the customer request for a ride, which the customer inputs to   
the app.

Then the instructions to pick up the customer are output to the taxi driver.

The third data flow we will add is the acknowledgment from the taxi driver that they are on their way; this is an input to the system.

Finally, there is a data flow from the system to the customer, confirming that the driver is on   
their way.

That is the diagram completed.

Data flow diagrams are quite simple to draw; here are a few hints to help you get them right.

The key to getting the diagram correct is to read the scenario carefully.

The system should be fairly obvious and remember that external entities can be organisations such as a bank as well as people.

You will probably draw your DFDs by hand, so take care to use the correct shapes. That is a rectangle for the system and ovals for the external entities.

Having identified the data flows, make sure you understand which are inputs and which are outputs. Add the arrow at the correct end of the data flow line, pointing into the system for inputs and out of it for outputs.

Finally, remember that external entities cannot have data flows between them, all data flows must go into or out of the system.