Unit of Analysis: Individual, Organization, Groups, and Data Series

Units of Analysis

Units of Analysis are the objects of study within a research project. In sociology, the most common units of analysis are individuals, groups, social interactions, organizations and institutions, and social and cultural artifacts. In many cases, a research project can require multiple units of analysis.

Identifying your units of analysis is an important part of the research process. Once you have identified a research question, you will have to select your units of analysis as part of the process of deciding on a research method and how you will operationalize that method. Let's review the most common units of analysis and why a researcher might choose to study them.

Why is it called the 'unit of analysis' and not something else (like, the unit of sampling)? Because it is the analysis you do in your study that determines what the unit is. For instance, if you are comparing the children in two classrooms on achievement test scores, the unit is the individual child because you have a score for each child. On the other hand, if you are comparing the two classes on classroom climate, your unit of analysis is the group, in this case the classroom, because you only have a classroom climate score for the class as a whole and not for each individual student. For different analyses in the same study you may have different units of analysis. If you decide to base an analysis on student scores, the individual is the unit. But you might decide to compare average classroom performance. In this case, since the data that goes into the analysis is the average itself (and not the individuals' scores) the unit of analysis is actually the group. Even though you had data at the student level, you use aggregates in the analysis. In many areas of social research these hierarchies of analysis units have become particularly important and have spawned a whole area of statistical analysis sometimes referred to as hierarchical modeling. This is true in education, for instance, where we often compare classroom performance but collected achievement data at the individual student level.

Concept of Unit of Analysis

- **Inanimate objects can serve as units of analysis.** For instance, if a researcher is interested in understanding how to make web pages more attractive to its users, then the unit of analysis is a web page (and not users).

- **Understanding the units of analysis can sometimes be fairly complex.** For instance, if we wish to study why certain neighbourhood have high crime rates, then our unit of analysis becomes the neighbourhood, and not crimes or criminals committing such crimes. This is because the object of our inquiry is the neighbourhood and not criminals.

- **Understanding the unit of analysis is important because it shapes what type of data you should collect for your study and who you collect it from.** If your unit of analysis is a web page, you should be collecting data about web pages from actual web pages, and not surveying people about how they use web pages.

- **Your unit of analysis is the "who" or the "what" that you are analyzing for your study.**

- **Your unit of analysis could be an individual student, a group, or even an entire program.**

- It is important to understand that **unit of analysis is not the same as unit of observation.** It is possible to analyze data in various ways.

For instance, data from the student survey was recorded for individual students (i.e., the unit of observation), but you could group the students by city and compare Boston students to New York students, thus creating a new unit of analysis (i.e., groups of students).

Level of Analysis

The units of analysis of studies may be classified into fewer categories or levels. It may not seem very significant to do so, but it, in fact, may help to see the hierarchical relations between the units of analysis possibilities that one can choose of, for her study.

1. Individual Level:

- Individuals – **most typical UA in social science: gender, race, income**. Example. 1. Older people are more afraid of crime than younger people. Variables: Age and fear of crime

- **Individuals are the most common units of analysis in social sciences.** Students, employees, union members, registered voters, citizens, political party members, managers, teachers, faculty members, officers, customers, sales representatives can be given as examples of individual level units of analysis.

- They **are important as in sociology, things revolves around understanding the relationships between individuals and society**, so we routinely turn to studies composed of individual people in order to refine our understanding of the ties that bind individuals together into a society.

- Taken together, **information about individuals and their personal experiences can reveal patterns and trends that are common to a society or particular groups within it, and can provide insight into social problems and their solutions.**

2. Group Level:

- Sometimes, **groups, which consist of multiple individuals, are the main focus of a study such as; study groups, work teams, departments, families, divisions, project teams,** residents of an apartment building/a block/a neighbourhood.

- The **groups which consist of only two individuals who have a defined relationship** (usually called dyads) may also be of interest in a study (e.g. subordinate-supervisor or mother-son dyads or married couples).

- In studies where the unit of analysis is specified as groups, **instead of the individual attributes of the members of the group, the attributes of the group as a whole are of interest** (such as group size) although they might be considered as the sum or mean of individuals' scores (e.g. the success of a class can be defined as the average score of the students in that class. These types of data are called aggregated data).

- Sociologists are keenly interested in social ties and relationships, which mean that they often study **groups of people, be they large or small**.

- **Groups can be anything from couples to families, to people who fall into particular racial or gender categories, to friend groups, to whole generations of people** (think Millennial and all the attention they get from social scientists).

- **By studying groups sociologists can reveal how social structure and forces affect whole categories of people on the basis of race**, class, or gender, for example. Sociologists have done this in pursuit of understanding a wide range of social phenomena and problems.

- **For example** this study that proved that living in a racist place leads to Black people having worse health outcomes than white people; or this study that examined the gender gap across different nations to find out which are better or worse at advancing and protecting the rights of women and girls.

3. Organizational Level:

- **Organizations differ from groups in that they are considered more formal and, well**, organized ways of collecting people together around specific goals and norms.

- **Organizations take many forms, including corporations, religious congregations and whole systems like t**he Catholic Church, judicial systems, police departments, and social movements, for example. Social scientists who study organizations might be interested in, for example, how corporations like Apple, Amazon, and Walmart impact various aspects of social and economic life, like how we shop and what we shop for.

- **In sociology, managerial sciences and other social science disciplines, investigating units that are wider than groups** (and usually these wider units involves multiple groups within themselves) are not rare at all.

- Studies that analyze business corporations, not-for-profit organizations, unions, army divisions, schools and universities are some of them. **Even a wider social entity may be the unit of analysis of scientific studies such as those in which societies, cities, nations are investigated.**

4. Social Artifacts and Social Interaction Level:

Other than individuals and social entities that comprise of individuals, sometimes products of social beings or interactions between social beings may be the unit of analysis of a social science study. Research in which the buildings, books, songs, jokes, tales, scientific discoveries, weddings, wars, strikes, laws, constitutions and meetings are investigated, are examples of studies with these kinds of unit of analysis

Data Series

A data series is used to create a Chart. A data series is a group of rows and columns. It is necessary to have a data series when we want to move from table view to chart view.

One or more data series can be plot in a chart. We first need to create a chart and then alter it with the various ways.

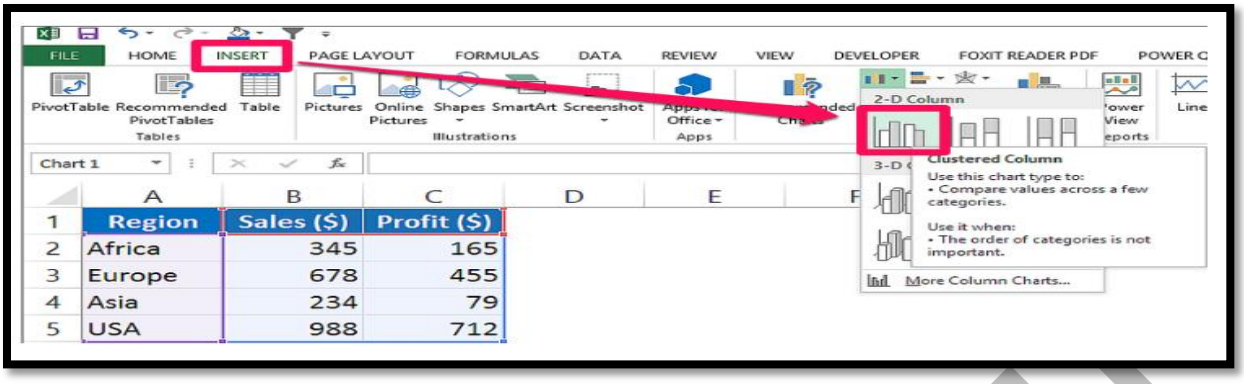
Steps to Add Data Series are

Step 1: Select the range of cells or Highlight the cells. Here A1:C5 range is selected

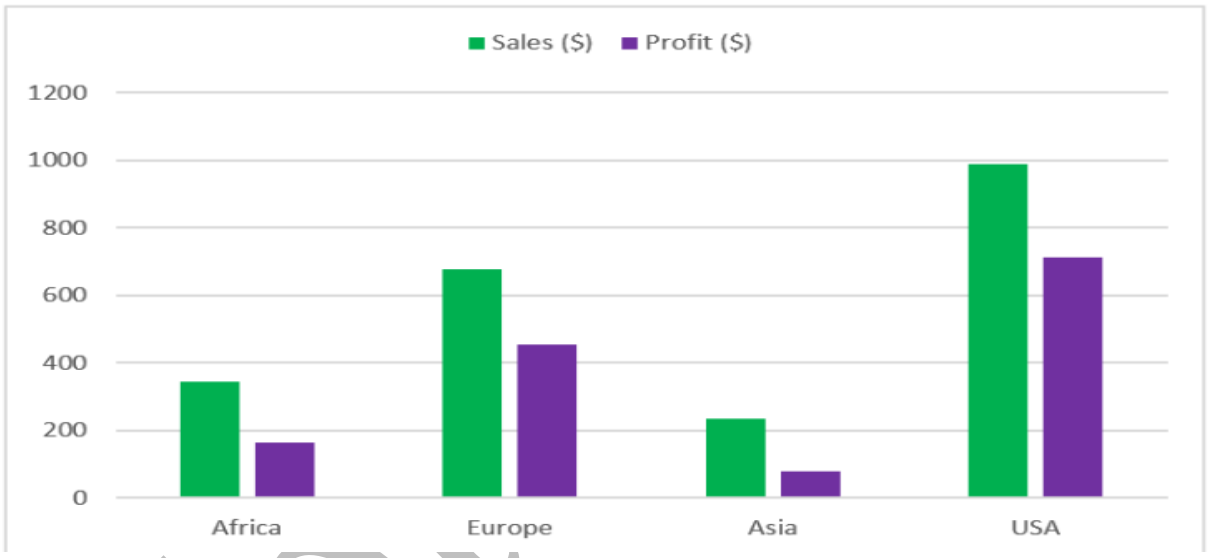
	A	B	C
1	Region	Sales ($)	Profit ($)
2	Africa	345	165
3	Europe	678	455
4	Asia	234	79
5	USA	988	712

Data Series - Data Example

Step 2: Go to the Insert Tab, Chart group, Click on Column Chart. From the drop down menu, Select the Clustered Column chart



Step 3: The result that is the clustered chart will be displayed in the worksheet.



Data Series - Clustered Column

To change the data series in a chart, you have two ways:

1. Add Data Series to the Chart

a) Chart located in the Same Worksheet:

After you have created the chart, you might need to add additional series to the chart which is located in the same worksheet. Here we have added Percentage series next to the Profit column. Percentage will be calculated by typing the percentage formula or =C2/B2*100. Use the fill handle to find the percentage for the remaining regions.

Steps to add data series to the existing chart in the Same Worksheet is as follows:

Step 1: Add a new data series next to or below the existing data series.

	A	B	C	D
1	Region	Sales ($)	Profit ($)	Percentage
2	Africa	345	165	47.83
3	Europe	678	455	67.11
4	Asia	234	79	33.76
5	USA	988	712	72.06

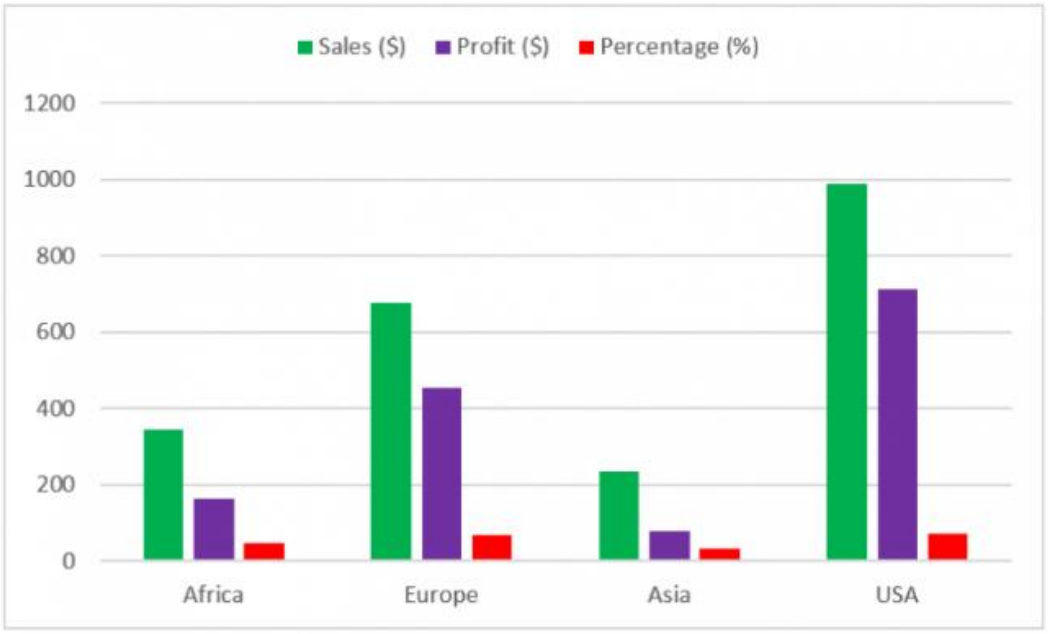
Step 2: Click on the chart. You see that the data which you added new is not selected in the data series in Excel.

	A	B	C	D
1	Region	Sales ($)	Profit ($)	Percentage
2	Africa	345	165	47.83
3	Europe	678	455	67.11
4	Asia	234	79	33.76
5	USA	988	712	72.06

Step 3: Drag the Selection area to the new data series as well.

	A	B	C	D
1	Region	Sales ($)	Profit ($)	Percentage (%)
2	Africa	345	165	47.83
3	Europe	678	455	67.11
4	Asia	234	79	33.76
5	USA	988	712	72.06

Step 4: You will see that your chart is updated automatically.



b) Chart located in the New Worksheet:

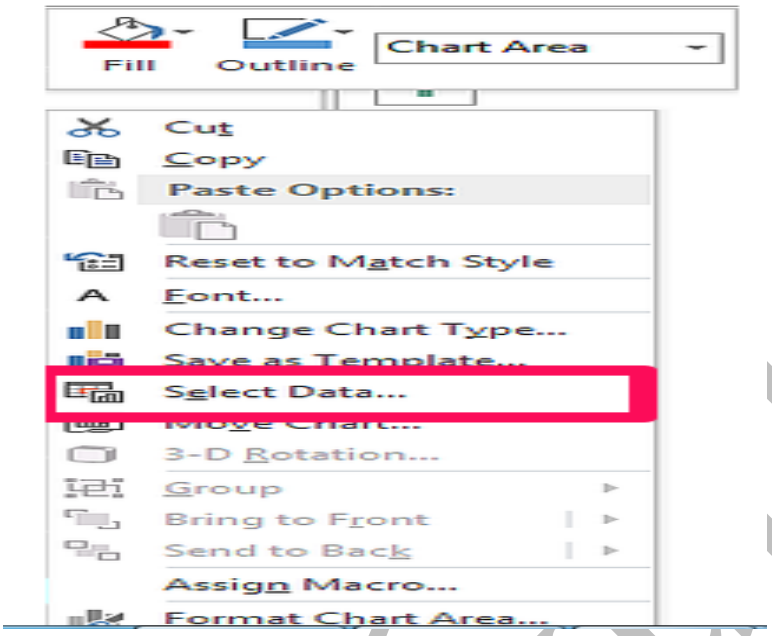
After you have created the chart, you might need to add additional data series to the chart which is located in another worksheet. Here it won't be a great idea to add drag the selection as you did while adding data series to the chart in the Existing worksheet. Steps to add data series to chart located in another worksheet is as follow:

Step 1: Add a new data series next or below the Existing data series.

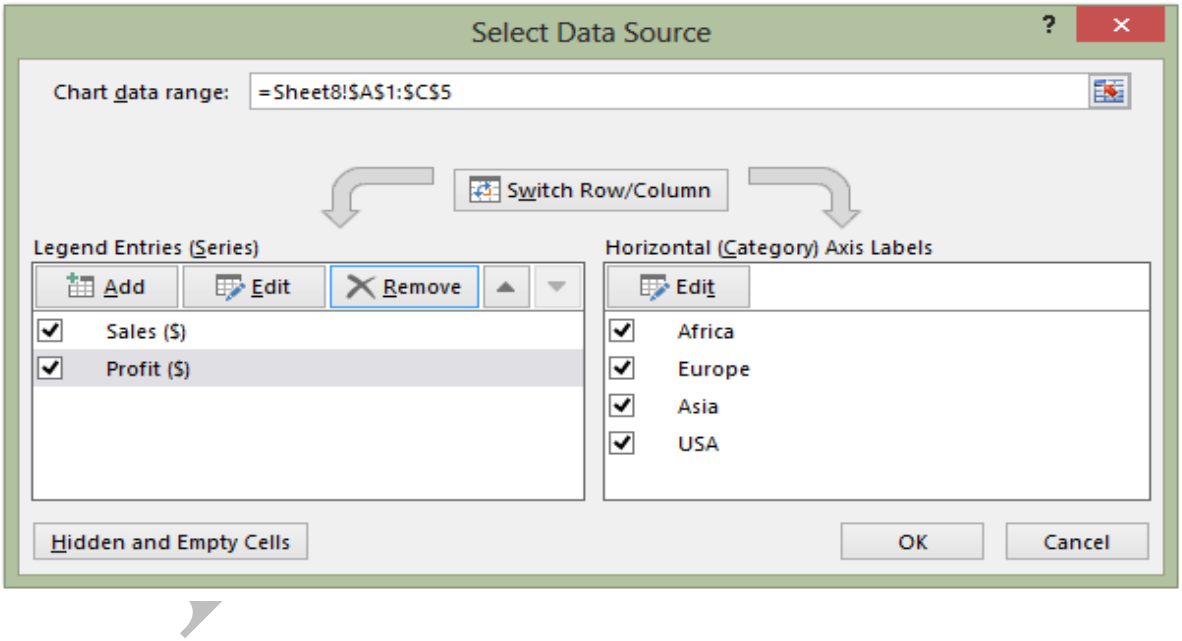
	A	B	C	D
1	Region	Sales ($)	Profit ($)	Percentage (%)
2	Africa	345	165	47.83
3	Europe	678	455	67.11
4	Asia	234	79	33.76
5	USA	988	712	72.06

Step 2: Click on the worksheet where your chart is located.

Step 3: Right click on to the chart and Click on Select Data.

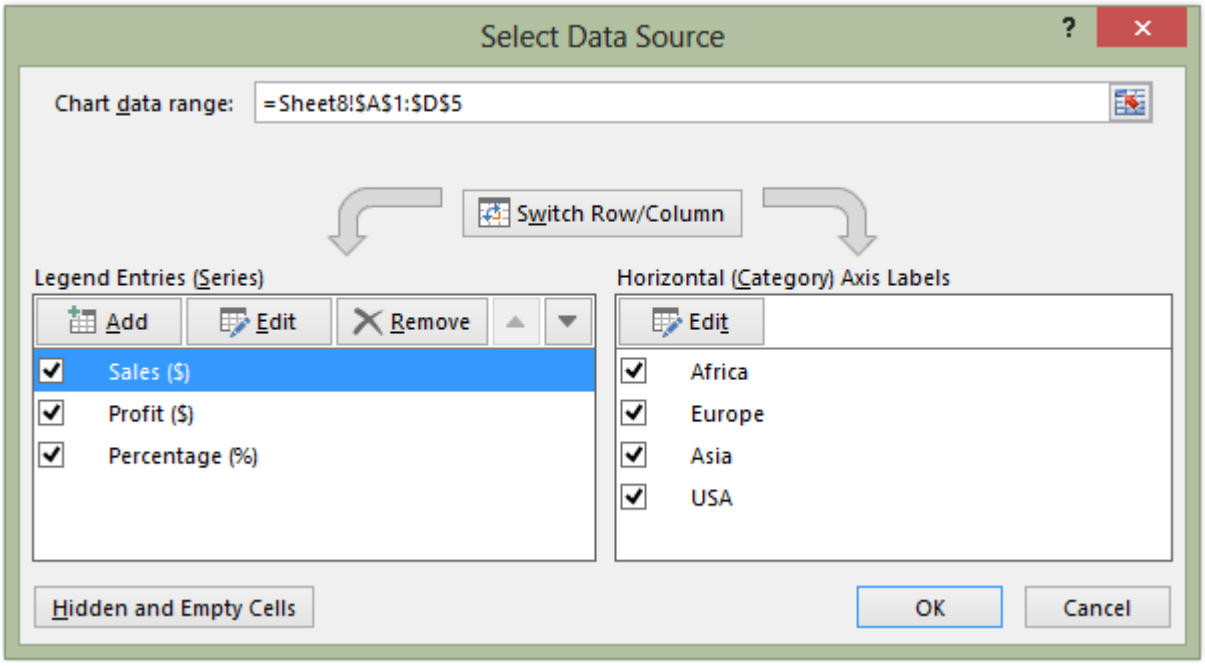


Step 4: The Select Data Source dialog pops up.



a. Click in the worksheet, and then click and drag to select the data you want to add to the chart new as well as existing.

b. Data series will appear under Legend Entries



Step 5: Click on Ok