

Course Name: Technical Communication for Engineers

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Lecture 12- Tables and captions

Hello everyone, Namaskar and welcome to the new discussion which we are going to have under this Technical Communication for Engineers course. In that discussion, we will concentrate on how to present tables and captions. because captions are equally important as tables and also captions are equally important in case of figures also. So, we will try to touch all these aspects in this discussion. As we know that tables and figures are used to display quantitative information. I would repeat the important point is try to display as much as figures instead of table. If a data can be represented in terms of simple figures or graphs, one should prefer that one rather than presenting in form of table. But sometimes certain data, you may not be having a completely numeric data. or a data is altogether a different type which cannot be displayed in any form of graphs or figures then it is fine. So, preference should always be given to graphs, charts, figures because what they are basically bringing out the quantitative information in a easily understandable manner.

Sometimes as we have also discussed in case of scatter plots or pie charts or bar graphs that they also brings the relative information. A table one has to go through line by line and row by row and then only one can understand some variations or some relationship between the data. Instead of tables, figures should be preferred but depending whether if you are having that possibility or not. Second point is whenever we are trying to represent or bringing technical information to readers, then we know that it is easy to provide ease for understanding to the reader. We should use the visual elements. And, the same saying that a picture tells 1000 words. So, that is what that kind of advantage we should take. Sometimes, figures and tables do not replace technical information but rather they make easier for readers to understand large quantities of data. So, they are not really replacing your technical but they are bringing large quantities of data in a just one plot or one figure. So, now while we organize the data, few important tips or points one should remember. The first one, if the results can be stated in one sentence, no visual is needed. Unnecessary over visuals are also not good or under visuals, under figures are also not good. A balance has to be struck. So, if it is possible that you can write in one or two sentences, then you do not require any figure or graph. If the numbers are more important than the trend, use a table. If you do not want to show the trend but numbers are important, use a table. And if the trend is more important then the numbers use a graph. So, here both possibilities are there that use a table because the trend can be shown very clearly, very easily using graphs. And we also know that even for preparing a graph we have to feed the

data in the excel. So, that is excel is a table or work sheet that is nothing but a table.

So, these are quite easily constructed using word processor, stable function or spread sheet program such as Excel. And then because in word or similar kind of word processor softwares a lot of you know analysis of the data, sorting of the data and other things cannot be done. It is only possible in the worksheet programs like excel. So, one has to see that what kind of plotting he is going to have. If that is required, it is fine.

But only for tables, then you need not to go for excel. Just do create a table using the word processors. whatever the one you are having. But there are few key elements of table and those are like a legend. You should have a legend for the table or the title I would say, a more preferable word here. Then column titles, the heading of the column should be there or in case of excel we say the field values. So, whatever the column is there, what is the meaning of that column. So, that field values are there and then table body that is the quantitative or qualitative data whatever is there and that should come in different rows and columns. So, the first row will be devoted completely for the column title and top of the table you should have a legend and title. One practice which is followed in almost all publication, thesis, project reports and there that the title of the table would always come at the top or caption if I make it very simple, caption of the table would come on the top whereas, caption for the figure will come at the bottom or a graph will come at the bottom.

But the title one can still have for a table or graph and that is inbuilt in the graphics itself. So, further these tables also can include subheadings or footnotes as per the requirements. Now, it is further important to think about organization of table as it think about the organization of paragraphs. As they are referred into the text or body of the text, the same way they should be organized. And within a table, the data should also be properly organized.

And that you may have a kind of sorting for the year if I am saying or minimum value, maximum value likewise. So, the organization of the table is very-2 important. And if a table is well organized which will then allow the readers or audience to grasp the meaning of the data presented with ease. very easily because while you are making a presentation using power point, you do not have much time to discuss a table. So, you just show the main points associated with the table or main data. And therefore, well-organized table would be easy for the audience to understand very easily. Otherwise, if you put too much data in one table and showing in one slide in a PowerPoint presentation, that may create confusion among the readers or audience and you will miss the point. Now, the title of the table headed by a number followed by a clear description title or caption. Caption is very much required and before that if there are more than or even there is one table, that table number will come and then it is referred whenever within the text. So, therefore, a number has to be there.

And in case of thesis, the table numbers will come according to the chapter. So, if the table

is coming in the chapter 2 and there are various tables, so that would be 2.1 and so on so forth. So, whenever somebody opens the thesis, if he finds a table 2.1, it can very easily be assumed that this table belongs to a chapter 2. Similarly, the title will let the reader know that what is the table about through this caption or table title and how it has been organised. And that information about the organization of the table or data in the table can also be mentioned within the caption. Now, I always prefer to provide as good information as possible within the caption. And that makes things very clear to the audience or readers. So, one should always try. And the same case in case of figures also. That the caption which we write in the below, describe the figure as much as possible. And the caption may be lengthier, but it is really very-very useful for readers. See, whenever somebody is evaluating or going through a document or thesis, report, what they do is, also said in earlier, that they read the title, if they find interesting, they read the abstract, keywords, introduction and then they start seeing the figures. And if they find any figure interesting, they will read the caption of the figure. So, if figure does not have much description of that, it is not good that the reader may lose the interest in that one. And therefore, it is as per the requirements, provide as much as information within the caption of a table and figure. So, this length and other things as I have already mentioned should be as per the requirement, but preferably more detailed information is always good. Descriptive, it should be descriptive, explanatory and whatever the interpretation of data is there that can also be provided in the capsules. And see, the good practice is to see examples from published papers, publish books.

And I will give you an example from a published book that is by S. Drury, Remote Sensing Geology. And if you open his book, you would find that every figure image is having quite good descriptive, good explanation about figure or image. And so, you just read the, see the figure, read the caption, you know what he would be talking in the text. And if I am further interested, then I will read the text which is printed in the surrounding or a previous page or later page. So, tables are read from the top down and remember this thing. Therefore, title should go first in the body of the table. That is why the caption of the table comes in the top, caption for the figure comes at the bottom. Now, the goal of column headings that is the field headings, field declaration and that is simply and clarify the table. If it is a given, say one column is having age, then age is days in months or years. That unit should also be there. And, so that the reader can understand these things or the details or columns or components of a table quite easily. So, the title should be, of course, this applies for everything and should have units all the time. If the data is having units, must mention units in the column of the table for each column. And, or the characteristics, if you do not have the numeric data, then you can write the characteristics of the, you know, heading for the column. So, now about the remaining part of the table. So, it should be the body of the table. That is, it should be organized in a way that helps the reader to understand the significance of the data. And of course, first you think that how reader will compare and will interpret, will understand the table and accordingly you should try. And the best practice is try 2-3 times to prepare table or organize the data within the body of the table and see which one is more convincing, is going to be more convincing in the users. Because what we are trying between different columns. We will be or the reader will be comparing the data. So, in that

way, one has to organize the body of the table. And, if a numerical data is there, if it is possible to plot, prepare a graph, if it is not, then one has to make, if it is in decimals, having some certain precision, say 2 place of decimal, then each row values should have the same decimal.

You may have even 0 0. 0.00 something like that. But they will look more organized way rather than just you know haphazard way. And in some case you are typing just one place of decimal value, in some case you are not typing, in some case you are typing two decimal places. This is not good. Keep the consistency within this precision of your numeric value.

And if there are whole numbers, means no real numbers without any decimals, then whole numbers should be lined up on the right side of the column. Sometimes table may be more appropriate for displaying data than a graph, sometimes only. I always prefer that if it is possible to present through a graph, one should do better. Tables are great for displaying multiple variables, specific values and comparing categories. But if you are having too many rows then again tables are not preferable. And also table will often require an audience to look up specific information to understand the data. So, picture is more or a graph would be more logical to put rather than a table. But again it will depend on what kind of data you are having and what kind of information you would like to share with the audience or readers. And therefore, that should be done. Again these points are coming that neat and logical manner.

So, everything should be prepared whether it is a table or graph. It is also important that all raw data should not be added to the table. Only the relevant data which has been discussed in the body of the text of your manuscript, paper or thesis, that data only should come. The raw data which you might have collected but you have processed the data, so do not bring that data in your table. And the same thing is also for the graphs that one need to consider the message in the data that to be communicated. What you want to communicate? What you want to convince the audience? And accordingly, one should choose. If you have done a statistical analysis then the data may be performed or summarized in the results section of your work or manuscript paper. And then you can use again a table to inform about that particular information. Now, this is another important thing, it is possible nowadays using our word processors or whatever. So, if someone has to really present a large tables, then alternate shading pattern for columns and rows is important. So, that one can really understand in a very effective manner. So, finally for this section of this discussion, the common features of a table. I am giving an example that what we are having the column heads are there and each column is further divided. So, that information is there for year wise and 2014-15 in row section, you are having the parameters or characteristics and then you are giving these values and of course, the numeric values are fed here.

Also, try to see what is the caption of the table. As said, it has to come on the top part and this should be neatly aligned. label columns with no guidelines and the units or percentage whatever is there. If required some information you want to add additional information

then you can have a footnote for this using an asterisk and then showing that the footnotes explain the parameters or statistical significance. So, this is one of the good examples of showing data is not cluttered, the entire space has been used and comparison between 3 years between these characteristics, the number of nests, nests hatching and other things is coming quite clearly here. So, that is one of the best way. Now, once we see the good example, we also would like to see the bad example. I always prefer to see the good example first and then bad. So, that one can really compare what went wrong in the bad example. So, first of all, the title or caption is really bad. Table number 1 does not say anything. So, there has to be a column and then lot of information related with this table should have come here. Rest of the things are alright but incomplete things are not preferred. Secondly, the division between these boundaries should have been shifted so that we are having just one line row like this. And these gaps are not also light. So, it is a poorly organised table. This is poor example or bad example. Table lacks a complete title. The sources of information is not provided. The row title straddles two lines as I have just mentioned. Each cell is bounded as if in a spreadsheet. And the alphabetical listing of regions could have been better for any understanding or searching for the information. So, that is also missing. This has been sorted out based on the region in alphabetical order that should have been a better way of representing data. Now, let us see almost the same data is being presented here through the information that this is the title of the table. Though the size of font is different, but just I wanted to highlight this part. So, that not instead of just writing table 1 and leaving as it is, it is giving full information. about the data which is inside the body of the table. So, it is giving the information and then the same data is represented here in a nice manner so that one can easily understand and looks also good compared to the previous bad examples. Now I would show you the examples from published tables or tables which have been published in literature. This is from our own publication. As you can see that there are multiple columns are there. Each column is having information plus table also says the details of studied earthquakes. And then these three earthquakes, their details have been shown here. the date, time, their lat long, geographic location, magnitude, focal depth all these things. So, because this data cannot be represented easily in the line graph or pie chart.

So, therefore, the decision was to have a table and that becomes much easier and then you can see that what is happening here. And, this the sorting here is with the less magnitude first and large magnitude later that has been shown here. Some sorting, some organization has to be there. Another example of you know the data is here that we are showing the thermal infrared anomaly from a different or the same publications. So, in here we have added the magnitude, focal and then pre earthquake rise the same earthquakes are here and the title or caption is also having full details. So, this is the best way of showing the data in form of tables. So, tables may be centered on the page. This is what publication prefers or in thesis or reports one should do it. Tables and figures are numbered independently in the sequence in which they are represented. in the text and start with table 1 and figure 1 of course.

In case of thesis there are chapters. So, if table is coming in chapter 1 or a figure then say 1.1, 1.2 and so on. So, that will automatically indicate that that table or that figure belongs to chapter 1. So, it is acceptable to abbreviate the word figure. Sometimes you would find in the text or the title you are having just fig and number. But in case of table, tab word cannot be used because it will give a complete different meaning. So, this should not be abbreviated. And labeled with the table number and description title above the table which we have also discussed previously that a title and descriptive title has to be there. That is very-2 useful. It is something like a subject line in case of an email or letter. Similarly, here this is the subject line of the table. So, all columns should be labeled properly. If there are some units, they should be mentioned in that one like unit of measurements, time, whatever is there. Sufficient details should be there against each column of the table. Sufficient details should be there against each column of the table. That will be always helpful. And, set apart from the text itself, the text does not flow around the table. So, keep table and text separately and let the publisher fit a text around it or whatever. In case of thesis, we need not to do such things because these can make reading little difficult.

So, table and text can come very separately, very easily. Now we come to about the figures and figure numbers also. So, figure numbers can be used as figure 1 or fig 1. It is important that all figures should have the number, all figures should be referred in the write-up, dissertation or rather cited in that. And because we would be providing a list of figures before the real text of the thesis comes. The figure numbers is used to allow the audience to find the figures which is have referred in the text. So, proper figure numbers are must. Figure title again the same conditions that it has to be descriptive or assertive and as much details one can provide needed that should be there. So, the descriptive title briefly describe what figure is displaying. But also lets the reader to identify any trends or relationships and is guided by the text you include in the result section. Because as I have said the reader might read first the figure or go through the figure and the title. If he finds very interesting then he might read the text, body of the text for much detail. Another way of you know writing a title for the figure is assertive. Title can help the audience to quickly identify the key message contained within the figure. But one should be sure that the title does not mislead the audience or overstate the results. It is something like the heading in newspapers that the heading should not mislead. So, here what is the heading of a figure we are talking. So, that should not mislead, overstate or understate. Balance has to be there in all such cases. Assertive titles can be used to identify specific trend found in a graph, highlight the key message of the diagram. But sometimes we may write that there is a correlation exists between these two parameters and the reader finds that there is no correlation.

So, that will come under this overstate the results. That is not good. So, then the audience may close, may not read further and basically you are losing here one of the audiences. So, the example like descriptive one is the effect of dam construction on fish biodiversity. This is descriptive example and the assertive is the dam construction results in loss of fish diversity. So, slight change in the wordings can bring quite good change between these

examples. Now, descriptive another example is that height distribution of two eucalyptus grandis plantation in Queensland. And the assertive one is figure 2, insects defoliation of eucalyptus grandis reduced canopy height. So, that kind of differentiation is there. I always prefer this kind of tone for a caption of the figure but it is up to you. Now, descriptive caption, example of descriptive caption from one of the publications which is Ramnathan and Ramana of 2005. And they are showing that, see this caption you know it starts with figure.14 and there are two maps. First is the A is the wind patterns in the month of January. B is the regional distribution of natural anthropogenic aerosol optical depth AOD. And each figure is having their own legend like AOD is there in the right figure.

Here it is having legend in the left figure. And likewise, it is there and this data has been from where it has been derived that is also mentioned derived from moderate resolution imaging spectroradiometer that is MODIS instrument on board of Terra satellites, December 2002. So, you are providing the date also. Therefore, it is very good example of a descriptive caption. Complete relevant details are here including you are having markings of A and B. No confusion. People can compare with the wind directions, ocean winds direction or ocean currents. Similarly, they can compare with the regional distribution of anthropogenic aerosol optical. Lot of discussion about the smog over Northern India, especially over Delhi. And even this year we are hearing lot about smog over Mumbai also. And so, if we see the wind direction, so these current directions, how they are influencing, why the concentration of this smog is mainly in the Indo-Gangetic plain and so on.

So, that kind of comparison can be done very easily if we are having such kind of plotting. And of course, descriptive captions. Another example is here and this I am talking from a book of Drury I referred back. And see that there are two images shown here of different bands data of Landsat. A shows the patches and B again the band 5 and this is band 7. Very clear, full description and once you read the entire description or the caption of the figure and go through these images, you would be able to understand very nicely. So, basically we are ending this discussion. Thank you very much. Namaskar.