Research Methodology
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Lecture - 65
Writing Grant Proposals, Part 01

If you choose research as your carrier, one of the things that you have to conduct is sponsored research. This is because any research that we conduct, requires equipment, manpower, consumables and other things. The way the scientific establishment in India and most other countries work is that, if you are a member of faculty in an institution, the institution is supposed to provide your salary, your office, maybe a space for setting up the lab. But, the rest you have to bring by writing grant proposals and bringing in money from external agencies.

So, writing project proposals, getting the money, properly utilizing the money for conducting your own research, finally, delivering the deliverables -- these are very important components of one's research career. Today we will learn how to actually go about doing that.

Many of you might say that my area of work is theoretical research. So, why do I need any financial support like that? Now, a theorist also needs computational power, a theorist also needs manpower. You need a bit of freedom in the funding. You might need to visit a collaborator, you might need to go to conferences within India. Conferences abroad are not supported normally by funding agencies, but within India you might need to go to conferences. So, in order to do networking you need money. You might need to employ manpower in order to do certain things and those things are not normally supported by the institute. You have to get money for that.

Importantly, having a project, having the fund from the project, gives a faculty member a lot of freedom in doing things. So, it is always advisable to have projects in hand.

There are, in India, various funding agencies that fund this kind of projects. There are some funding agencies that are general in nature. They fund projects in various diverse areas, not area specific. There are also funding agencies that fund area specific research. General funding agencies, for example, the Department of Science and Technology, the

DST, its branch but more or less works independently, the SERB, the Science and Engineering Research Board. There is the CSIR, the Council for industry Scientific and Industrial Research, there is also the Department of Atomic Energy whose funding body is BRNS.

These bodies normally fund research in diverse areas, while there are area-specific funding agencies also. For computer science related projects there is the Department of Information Technology, for biology related projects there is a Department of Biotechnology, for Earth Science related projects there is the Ministry of Earth and Environmental Sciences. So, these are the agencies that either support general research or they support a specific area of research.

Always you have to have a very clear idea. “I will do research and therefore, give money” -- that does not work. You have to have a very focused idea as to what you want to do. You have to convince a body that this idea is worth pursuing and you are able to pursue that. That is the whole purpose of writing a proposal and defending a proposal.

So, you have an idea. That idea has to be propagated. You have to convince a body about that idea and that is a challenge every researcher has to face. Apart from these funding agencies, now under the National Education Policy 2020, it has been proposed to form another nationwide research funding agency called National Research Fund. It is not yet clear what will be the status of the other existing funding agencies when the NRF starts functioning in full form, but as yet the proposal is that it will be an additional funding agency. So, whatever I have mentioned as existing so far, you have to add this NRF.

Now every funding agency sometimes identifies some thrust areas and they advertise for projects on that. That means, they identify thrust areas and they invite projects in these thrust areas. Sometimes development of a specific material can be a thrust area, sometimes alternative energy resources can be a thrust area. Sometimes solving the water problem can be a thrust area. These are identified as thrust areas and if you submit a proposal in a thrust area then, since some money is allocated for the thrust area, it becomes relatively easier to get funding. But otherwise, any idea that you have, if you are able to convince a body that the idea is workable and you were able to do that, then this is normally funded.

So, the first thing is to identify the funding agency to which you want to submit it and then you have to write up the project proposal. Every funding agency has a format in which you have to write and submit the project proposal. These formats might be different, but in general they ask for the same set of informations, may be arranged in a different order, but ultimately they need the same set of information in order to judge whether the project is fundable or not.

So, what I will do is to take one such example and go by that. For other funding agencies, all you need to do is to download their format and write accordingly. But the same set of information will have to be provided. Before you start writing you have to figure out which agency you will submit it to.

If it is a general purpose agency, you might anticipate that the reviewers might not be very area-specific. So, you have to be bit explicit in writing the proposal. If it is very area specific, then you might get area-specific reviewers.

The way the whole process is conducted is that, after you submit it (mostly these days submission is online), the agency sends it to a few peers in that area within India. That means, scientists within in India who are working in that area or related areas are asked to comment on the suitability of this proposal and whether or not the agency should fund it.

Any badly conceived and badly written proposal is sieved out immediately. These do not stand any chance. It has to be a well conceived and well written proposal. After the first set of review is done, a few of the proposals are shortlisted and the proposers of these proposals are asked to defend their proposals before a committee. Either you have to go there physically or it is online. You have to give a short talk on your idea and you have to defend. Not only defend the idea, but also defend the budget.

Finally, if the body is convinced, they approve it. Then you get a letter from that agency saying that your project is approved. Then the money comes and your institution then has to open a file. Normally there is a section in every institution that handles the clerical part of this project handling. They open a file, give a number, and from then onwards every expenditure incurred by that project is entered in that file, so that every year you can send the financial and other reports.

So, you have to remember that the project proposal that you submit is, in some sense, similar to submission of a paper: in the sense that it will also be subjected to peer review. It has to be written that way. Your objective is to convince the reviewers that you are able to do this and your idea is worth pursuing. In case of a paper, it is a work that you have done. In case of a proposal it is a work you have not done. It is only in the form of an idea and therefore, the whole idea is to sell the idea. The whole idea is to convince that the idea is workable. It is a little more difficult, but doable.

So, what I will do is, I will take one such funding agency's format and whatever they demand. So, we are now talking about sponsor. Let us go by that.

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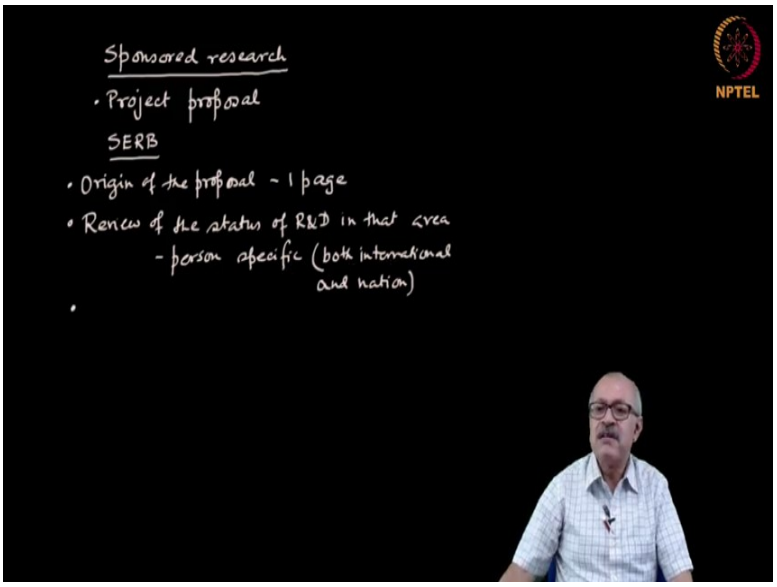

As I said, today we are handling sponsored research, and for that you have to write a project proposal. Now as I said, there are different funding agencies and each have their own proposal format, but since the same set of information needs to be presented, I will take the proposal format from the SERB (Science and Engineering Research Board), one of the prime funding agencies in science.

Their format demands that certain sets of information have to be uploaded in the online form itself, in the text boxes, and in addition there is a detailing of the proposal to be submitted as "Other technical details" as a separate PDF file. What I will do is, I will first refer to that file, the "Other technical details" file, whatever it contains and then I will go to the things that we have to upload as the text boxes.

The first is the origin of the proposal: why do we want to do this? Why is it interesting? Why is it worth doing? What is the background on the basis of what you are doing this? The origin of the proposal is a brief statement of that, from which anybody will get an idea of what it is all about. So, it is normally about one page. These are flexible. In case of the text boxes they normally define the maximum limit, the word length. But in case of the material that you are to provide as a pdf file, there is no such limit. But it is always better to be explicit, but brief. Writing pages after pages, nobody will read.

You have to write only what is really relevant and interesting for the reviewer. What you want the reviewer to read. So, that is the origin of the proposal. Then as in preparing a research paper, you have to state what is already known in that area, then you have to review the status of R&D, research and development, in that subject.

Here you have to state what is already known. But the difference between the literature review part in a paper and in a project proposal is that, here the reviewers would like to know who is working on what. Suppose it is related to a development of a specific material, then which group is doing what? Every group around the globe is trying in a particular way to develop similar materials. So, one group might adopt one method, another group might adopt different materials or components and so on and so forth. So, you need to know those and you have to present those. That means, the reviewer then is clear that this group is trying this way, that group is trying that way, or if it is so that no group is trying what the proposer wants to do, then what is already known in that area on the basis of which the proposer has to defend that the proposal is meaningful.

So, this has to be more or less person-specific. We write person-specific in the literature review of papers also, but here it is to be more person-specific. And moreover, you have to write both the international and national status. That means, the reviewer definitely would like to know who, within India, are working on similar areas. What are their expertise? How are they trying it? How much progress have they made in that particular direction? This will justify your own attempt.

If somebody is doing that and you want to do exactly the same thing, there is no point doing that because another person is doing it. So, you have to justify in what way your proposal differs from what is being done elsewhere, internationally as well as in the nation. Sometimes, if it is a very high-end project, a lot of expenditure is needed, a lot of

high-end equipment are needed, and if there is another group working nearby, then you might be asked to share the equipment.

So, the reviewers want to know exactly who, in this area, is working within India and also internationally, and how much progress have they made. That is important.

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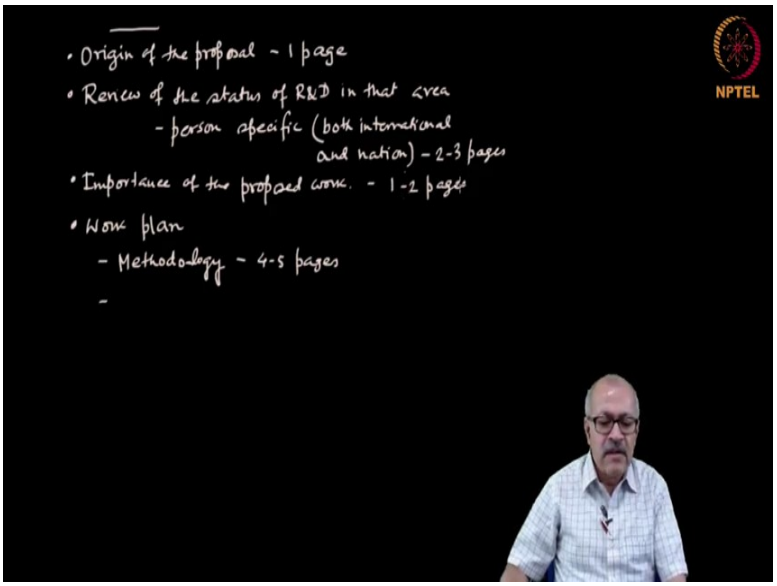

And then, on that basis, you have to state the importance of the proposed project. There you have to contextualize. That means, in the context of the work that has already been done or are being done, in that context, what is the importance of your work, what actually are you trying to do which is different from what the others are doing.

In this part, you have to very clearly state the motivation of this work: why is it important, why is it interesting. So, that has to be brought out very clearly in this part. What will be achieved if this project is successful? What is the difference between the project having been done and the project not having been done? There must be a difference. That means, you have to also specify the deliverables.

So, after having stated the importance of the proposed work, the motivation, the novelty of the proposed work, then comes how will you do it, the work plan. In the work plan, you have to specify what will you do. Will you perform an experiment? Will you do some simulation? Will you develop some theoretical models? Will you go to the field and do some field work? Will you rent some observation time in a telescope? What

exactly will you do? That has to be clearly specified in this part and the work plan is actually divided into a few components.

Firstly, you have to state the methodology. What will you do? Every research, as I earlier said, has a question. It is trying to answer a question, and that question has to be very clearly stated. Then you have to state how will you try to obtain the answer to that question and that comes under 'methodology'. So, the methodology will include whatever you plan to do, what exactly will you do, and the succession in which various steps will be taken.

You can say these in around 4 to 5 pages. This is a major part and you have to convince the reviewer that this is how I will actually achieve, what I intend to achieve. The review of the status: this will be around 2 to 3 pages. The importance of the proposed work normally is 1 to 2 pages.

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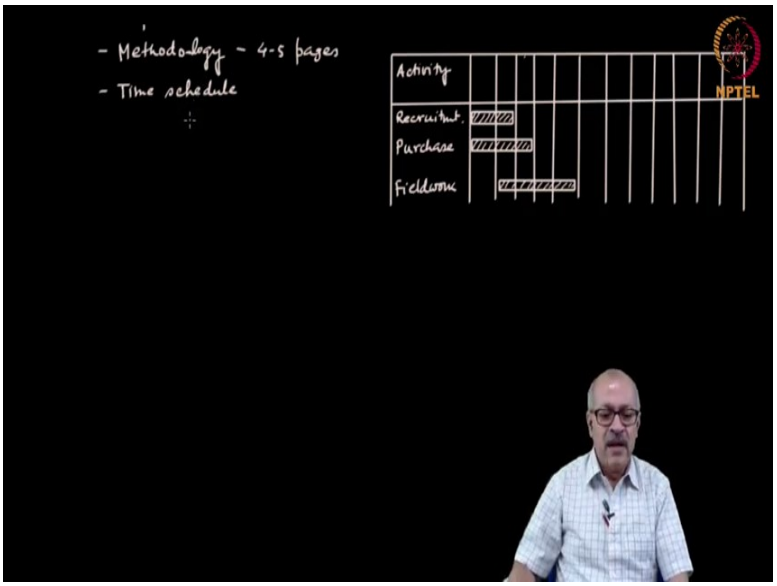

If you state the methodology, the things that you will do, you have to also state the time schedule. The whole period, normally it is about 3 years, the 3 year period will be divided into the quarters, each year is divided into 4 quarters, and in each quarter what will you do.

For example, the first quarter normally goes in buying and setting up the equipment, buying the consumables, recruiting the manpower. So, these are the things that normally

takes up the first quarter and then you start setting up the experimental set up and thus it goes.

In each quarter what you do, what you plan to do, that is to be stated. The normal style of writing that is in the form of a chart. So, you will have to produce a chart, something like this. There would be the activity, here we will have to write the activity and here there would be 3 years divided into quarters.

So, there has to be 12 such quarters. Now, suppose here you write recruitment, then you write say purchase of equipment. Now, recruitment will be a something that might take up two quarters. So, it is like this. Purchase might take up three quarters, something like this. Then the different components of the actual work.

If you are going to the field work, then you might say that I will go to the fieldwork in this period, then I will do analysis of the result in another quarter. Finally, the last quarter has to be rounding up the results, writing the papers, writing the final project report, and so on and so forth.

So, it has to be in this form, the way I have just shown. That means, these are in the form of the bars that take up certain quarters. And here the different activities that you have specified in the methodology section ok. So, that is how the time schedule is written.