How to Present R&D Activities to Non-Technical Audiences

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Research groups rely on public and private funding to finance their research work. The different people involved in the financing of R&D are the public officials who administer the funding programmes, the technical experts who evaluate the 'scientific excellence' of the research, the business executives who require new technologies and the politicians who prepare economic and social policy. Researchers are under more and more pressure to present their activities to a wide range of audiences. Many books and courses exist on presentation skills. This article concentrates on the skills that are specific to the needs of researchers. The article is based on twenty years of presenting R&D activities at technical conferences, business conferences, contractors' meeting and at public events. The article is also based on a training course developed by the author.

Problems encountered by researchers presenting their work.

The most common presentation problems quoted by researchers include the following:
- Getting to the point;
- Having time to prepare the presentation (either due to short notice or trying to be perfect);
- Tailoring the presentation to the audience;
- Knowing how much detail is required.

Other problems include nervousness and technical problems with equipment (especially the LCD projectors for PowerPoint presentations). Speaking in another language is quoted as a major problem.

When researchers present their activities to non-technical audiences the following problems are observed:

Researchers use presentations to demonstrate that they know their subject and that they work hard !

These two problems consume over 50% of the time in technical presentations. Researchers use public presentations to demonstrate their depth of knowledge in their field and the complexity, intensity and sophistication of their work. If a researcher can avoid the above they can save 50% of the available presentation time.

Researchers tell us what they do NOT why they do it !

In a presentation the researcher must first educate the audience on why the topic is important. At the beginning of every presentation the researcher must answer the following questions: Why bother with this type of work? Why not purchase the solution on the market? If it is so important, why wait until now (and not 5 years ago)? Is this totally new or are you building on other peoples work?

Jargon, buzz words, terminology

This problem is common to all professions but science seems to generate acronyms and buzz words at a faster rate. Examples include acronyms such as IPR (Intellectual Property Rights), SME (Small and Medium Sized Enterprises) and WP (work plan). These acronyms should be avoided in presentations. Use the full words rather than the acronyms.

Researchers focus on their activities rather than on their results

Most organisations and individual describe what they do based on what they produce e.g. Microsoft produce Excel, PowerPoint, etc. Siemens produce computers, controllers etc. Researchers, on the other hand, are often content to describe what they do solely on their activities. Researchers claim that they undertake research on nanotechnology, biotechnology etc. But what do researchers produce ? Researchers produce new knowledge, prototypes, documents, software, data, transgenic mice, new materials, etc. In presentations researchers must focus on their activities AND on their results.

It is also essential that   the results must be expressed in the words of the user. Some examples are shown in the following table.

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Table 1: Examples: Translation of research language into user language

Scientific Result	User of the Result	What the User Calls It
Report on the system	Design Engineer	Design Specification
Performance Improvement	Production Manager	Process Improvement
Instrument Data	Instrument Designer	Calibration Curve
Engine Data	Engine Designer	Performance Data
Results of tests	Medical Personnel	Screening Criteria
Data	Policy Maker	Environmental Indicators
CD ROM	Trainer	Training Material
Database	Researcher	Search Engine
New Knowledge	Researcher	Scientific Publications

NB: In a presentaion the researcher would   present Column 2 and Column 3 e.g. "a design specification for a design engineer" or " a calibration curve for an instrument designer".

How to Prepare a Technical Presentation

The following emotional phases are common to all <u>IMPORTANT</u> presentations.

> **Phase 1: Privileged to be asked**
> **Phase 2: Realisation of work involved**
> **Phase 3: Start planning** *(Sorry you agreed)*
> **Phase 4: Preparation of talk** *(Really sorry you agreed)*
> **Phase 5: Before presentation** *(Panic !)*
> **Phase 6: Presentation (*I feel great*)**
> **Phase 7: Audience applauds** *(All the effort was worth it)*
> **Phase 8: Asked to give another talk** *(Go to phase 1)*

The important message here is that presentations have three very distinct phases: (1) The Planning Phase (2) The Preparation Phase (3) The Presentation Phase. The following section summarises what is required in each phase.

Sample Presentation
A researcher, specialising in nanocomposites, has been asked to make a presentation at a conference organised by the European Plastics Industry Association.

The Planning Phase
All presentions have a generic format and this is summarised in Figure 1.

Figure 1: LAYOUT OF THE PRESENTATION

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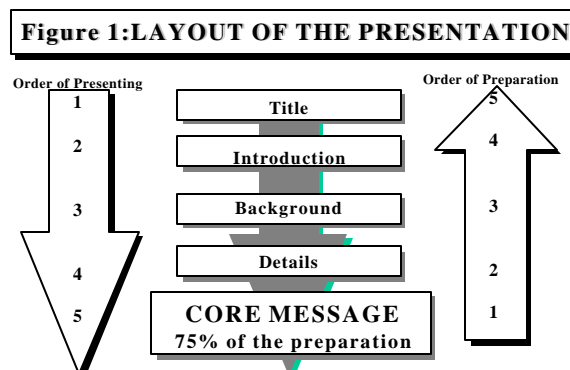
The important message here is that 75% of the planning consists of defining the **Core Message.** This is the most important issue in any presenation. **The Core Message will depend on the audience.** For example if we use the case of the researcher making the nanocomposites presentation the Core Message could vary in the following ways:

Table 2: How the Core Message depends on the audience

EXAMPLES OF DIFFERENT AUDIENCES	POSSIBLE CORE MESSAGE
Business Enterprises funding the development of a new nanocomposite process.	*" The system works"*
Funding Agency who is providing funding to the researcher.	*"The work is on schedule"*
Business Enterprises interested in funding a pilot process.	*"We have the technical solution. It is working in the laboratory and we need funding to demonstrate it at a pilot scale".*
Presentation to a multinational company interested in funding the activities of the researcher.	*" We already work with companies like yours"*

When you identify the **Core Message** everything else must lead up to this. The best way to test a **Core Message** is to imagine if someone woke up at the end of the presentation they would have a clear understanding of the presentation. The **Core Message** should also be structured so that it can be discussed after the presentation.

To find the **Core Message** the presenter must first understand how the presentation will be judged (a) by the audience (b) by the researcher's organisation and (c) by the presenter themselves.

In the cases of the researcher preparing the presentation for the Plastics Industry Association the Core Message would be identified in the following way:

a) The Plastics Industry will say the presentation was brilliant if:

They understand the relevance of nanocomposites to their business.
They have facts and figures to compare nanocomposites with their existing products.
They receive a roadmap on how to incorporate nanocomposites into their business.
They identify funding to support the above.

b) The researcher's organisation will say the presentation was brilliant if:

The industries were interested in funding R&D activities
Meetings were requested to discuss cooperation

c) The researcher (the individual) will say the presentation was brilliant if:

The researcher is respected by the industry as an expert in the field.
Ther researcher is requested to submit proposals for R&D funding

The Core Message ?

- Nanocomposites market estimated at 10 billion € by 2010
- First markets for nanocomposites: Aerospace, automotive, packaging, computers.
- We are one of the European Leaders in this field.
- Funding is available in European Union R&D Programmes (CRAFT).

(This was actually a real case. The researchers submitted a proposal based on the above and received a score of 5/5 for economic relevance of their proposal. They also received the full amount of funding they requested. The presentation was later published in the Plastics Industry Yearbook 2000)

Preparing the Content

Title: This should be based on the **Core Message** e.g.

The Importance of Nanocomposites to the European Plastics Industry over the Next 10 Years.

Background:
Educate the audience with facts and figures that support the Core Message. For example in the above presentation the following table was presented:

Table 3: Improved Performance of Plastics with a 3-5% weight nanocomposite loading.

Performance Properties	Improvement over existing products
Tensile Strength	100-700 %
Flexural Modulus	50-300 %
Thermal Stability	30-80%
Gas Permeability Reduction	100-400%
Heat Release Rate Reduction	60-80%

Details of the Presentation:
This section should only contain details you need to support the **Core Message.**

In the above example the presenter would demonstrate the samples of products made using nanocomposites, list industries already active in this area (Toyota Central R&D Labs, Inc) and would describe the changes that would have to be made to the industrial processes. The presenter would also provide an overview of the European Union R&D programmes and the programme that would support this type of project.

WHAT DIFFERENT AUDIENCES LOVE/HATE TO HEAR

The following table summarises how different audiences judge presentations.

Audience	What they like to hear	What they hate to hear
Business Executives	Commercial awareness of <u>their</u> needs Business Arguments Facts and figures relevant to their business Technical competence in the subject Professional image Ability to communicate ideas	Lectures Theories Jargon Pet Projects
Public Officials (Funding Agency)	Relevance to their policies Serious scientists Respect for deadlines/paperwork Real successes	Money hunters (with no science) Contractual Problems Problems without solutions Surprises
Politicians	Issues which support their ideas Image and public relations for themselves Success Stories Slogans e.g. 'The future is nano'	Controversial issues Complex issues
Other Scientists	Latest breakthroughs Sources of information (websites) Relevant conferences/seminars Sources of funding Technical leaders in the field	Old stories

TIPS DURING PRESENTATIONS

Many books have been written on this subject. Here we will simply include the most important points that should be remembered by researchers:

1. **When you stand up on the podium everyone is with you !** This should help you overcome any nervousness you may have.
2. **DO NOT EXPECT A REACTION FROM THE AUDIENCE** This is the most important point I have learned over 20 years. If people are genuinely interested in your presentation all their brain cells are used to concentrate on your presentation and very few brain cells are left to control their facial expressions.
3. **Speak slowly and clearly.** People speaking in their non-native language have a major advantage here – they have no option but to speak slowly and clearly.
4. **How to deal with interruptions** (e.g. your notes falling on the floor) Pause, Correct, Continue. It looks very professional.
5. **Adopt a confident poise, have a simple plan for your hands and scan the audience.**
6. **How to finish** You must have your own closing line. For example " Thank you for your attention and if you have any questions I would be delighted to answer them. THANK YOU VERY MUCH.

CONCLUSION

When you make a professional presentation the experience can be magic. All the planning, all the preparation and all the practice is worth the effort. Next to science, the ability to communicate your ideas to any audience is the most important skill for a researcher. The important point to remember is that when you are planning the presentation start with the **Core Message**, then identify the details you need to support the **Core Message** and finally include background information to educate the audience on issues which will help them understand the **Core Message**. You make the presentation in the reverse order i.e. background, details and then the **Core Message**. To perfect your presentation skills you must practice, observe, refine, practice, observe, refine….

AUTHOR

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