

Presenting your work to different audiences: what to consider?

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My experience as a presenter

I remember the anxiety of presenting my work for the first time to...

- ▶ a group meeting
- ▶ an international conference
- ▶ a dissemination activity
- ▶ my thesis defence

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⋮

- ▶ a lecture (today)

What I was afraid would happen...



Same person, same topic — very different presentations

Same person.

Same research background.

Same technical expertise.

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But the **presentations were not** the same.

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Why?

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Why?

The audience was different.

The audience is not a parameter of the talk.
It is **the main design constraint**.

A presentation is not a transfer of content

The goal is not to move information
from your slides into the audience's heads.

The goal is to **transform** what they **know, believe, feel and do**.

The same message requires a completely different presentation
depending on **who** is listening and **what** you want them to take away.

A presentation is not a transfer of content

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Transformation means change in the audience

Before and **after** your talk,
something in the audience should be **different**.

	Before	After
Know	What do they already understand?	What should they understand that they did not?
Believe	What assumptions or doubts do they bring?	What should they now trust or reconsider?
Feel	What is their attitude toward your topic?	What should resonate, concern, or inspire them?
Do	What would they do without your talk?	What should they be willing or able to do after it?

The presentation content is what drives the transformation.

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Example: a HumanIC transformation table

The presentation: Our active airflow control strategy can reduce infection risk while improving efficiency and thermal comfort by ...

	Before	After
Know	Operating rooms are already highly sterile environments.	There is still infection risk in operating rooms.
Believe	Infection control, thermal comfort, and energy use are mostly separate engineering problems.	Airflow control influences how contaminants move and is coupled with comfort and energy performance.
Feel	Distant from HumanIC topics.	Interested and motivated by possible cross-disciplinary connections.
Do	Listen as external observers.	Ask questions, propose ideas, and look for possible collaborations.

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Example: content needed for the transformation

To change what they know:

- ▶ Thousands of patients develop healthcare-associated infections every year.
- ▶ This happens despite modern ventilation systems, which cannot adapt to changing conditions.

To change what they believe:

- ▶ We designed a real-time active strategy based on sensors and ventilation systems.
- ▶ The design accounts for energy efficiency, thermal comfort, and infection prevention.
- ▶ The results show benefits in thermal comfort, energy efficiency, and infection prevention.

To change what they feel:

- ▶ Contaminant dispersion, as a fluid-dynamical problem, can be attenuated by airflow manipulation.
- ▶ CFD simulations show that airborne contaminants are transported toward the surgical field.
- ▶ CFD simulations with the strategy activated show that contaminants are reduced by $X\%$ around the patient, while efficiency improves by $Y\%$.

To change what they do:

- ▶ Real-time deployment in experiments remains an interesting challenge for the future.
- ▶ Future challenges requiring collaboration between diverse experts.

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Example: reshaping the transformation into presentation content

Presentation part	Content used to produce the transformation
Introduction	Thousands of patients develop healthcare-associated infections every year ...
Problem framing	This happens despite modern ventilation systems ...
Method	We designed a real-time active strategy ...
Design objectives	Design accounts for energy efficiency, thermal comfort, and infection prevention ...
Mechanism	Contaminant dispersion can be attenuated by airflow manipulation ...
Evidence and Results	CFD simulations show that...
Conclusions	The results show benefits ...
Future perspectives	Real-time deployment requires expert collaboration

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Why is presenting generally so hard?

Why do we struggle to adapt to different audiences?

The curse of knowledge

When you know something well,
it becomes very difficult to imagine *not* knowing it.

You forget what it felt like to encounter the idea for the first time.

This is why experts oversimplify for some audiences
and over-complicate for others.

The solution is not more expertise.
It is **deliberate empathy** — understanding your audience before you speak.

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Part 1 of 3

Who is your audience?

What do they know, what do they care about,
and what do you want to change in them?

Before preparing a talk: ask three questions

What does my audience already know?

vocabulary, familiarity with the topic, level of expertise

What do they expect from this presentation?

to learn, to evaluate, to be convinced, to decide

What do I want them to think, feel, or do at the end?

the desired transformation — your call to action

These three questions define **what** you say,
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Audience	What they care about	What they distrust	Desired change
Same-field scientists	Novelty, correctness	Oversimplification	<i>Trust the method, result</i>
Other scientists	Relevance, transferability	Jargon	<i>Understand why it matters</i>
General public	Meaning, impact	Abstraction	<i>Care and remember</i>
Stakeholders	Decision, action	Uncertainty	<i>Support or ask more</i>

Different audiences require a **different version** of the **same message**.
Not a different topic — a different transformation.

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Audience	What they care about	What they distrust	Desired change
Same-field scientists	Novelty, correctness	Oversimplification	<i>Trust the method, result</i>
Other scientists	Relevance, transferability	Jargon	<i>Understand why it matters</i>
General public	Meaning, impact	Abstraction	<i>Care and remember</i>
Stakeholders	Decision, action	Uncertainty	<i>Support or ask more</i>

Different audiences require a **different version** of the **same message**.
Not a different topic — a different transformation.

Translate the transformation into a concrete goal

Scientific conference:

“At the end, they should trust my methodology, results and why they matter.”

General public or dissemination event:

“At the end, they should understand why this research matters.”

Stakeholders or funding bodies:

“At the end, they should want to support the project.”

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One sentence summary of your presentation.

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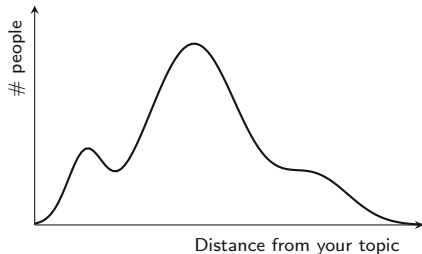
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Different events, different audience compositions

Event	Audience
Big scientific conference	Few people are exactly on your topic; most are specialists in related areas.
Small or thematic colloquium	Most people are closely aligned with your topic.
Dissemination activity	Most people are far from the technical topic but may care about its impact.
Group or lab meeting	They know the scientific context, but not necessarily your specific problem.
Thesis defence	A mixed audience: examiners, committee members, colleagues, and non-specialists.

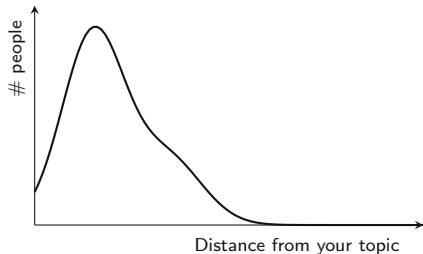
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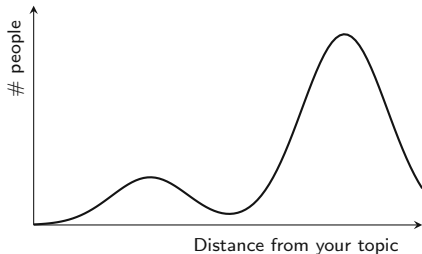
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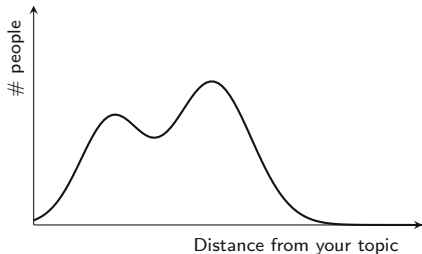
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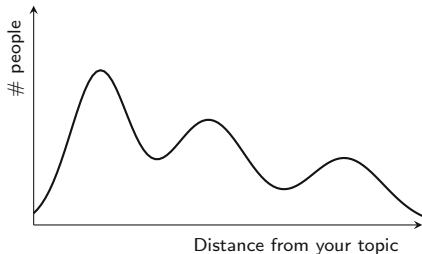
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Part 2 of 3

How do you reach them?

Narrative structures, language, and the path
from your message to their understanding

You know the audience and the transformation. Now what?

Once you know *who* is listening
and *what* you want to change in them,

you need a **path** to take them there.

That path is the **narrative**
the structure that gives your talk tension, direction, and meaning.

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The default trap: And–And–And

This happened. And this happened. And this happened. And this happened.

A typical research talk

We modelled airflow in an operating room.



We simulated airborne particle transport.



We added local sensing near the surgical field.



We designed a predictive control strategy.

So what?

There is no tension.

There is no reason to keep listening.

And–And–And is a list of facts,
not a story.

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And–And–And is a list of facts,
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And–But–Therefore: context, tension, consequence

Context. Tension. Resolution.

HumanIC example

Operating rooms need clean, safe, and comfortable airflow **and** current ventilation systems are designed for room-scale control.



But exposure near the surgical field is local, transient, and driven by heat plumes and clinical activity.



Therefore we developed a predictive control strategy to reduce airborne particle exposure near the surgical field.

Why does it work?

It gives the audience a reason to care **before** giving them the solution.

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Problem–Tension–Resolution: make the difficulty visible

What is at stake? Why is it hard? What changes?

HumanIC example

Problem: Operating rooms are subject to airborne infection risk. The surgical field must be protected from airborne contamination.



Tension: A high ventilation rate does not guarantee low *local* exposure. The dynamics near the patient are dominated by transient effects.



Resolution: A sensor-informed predictive controller adapts airflow in real time to reduce contaminant exposure while accounting for people movement and operating-room activity.

What is the advantage?

It makes the **difficulty** visible, not only the result.

Best for scientific audiences.

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Pixar spine: cause and effect, not chronology

A simple causal chain that anyone can follow.

HumanIC example

Operating-room ventilation has been designed to keep the room clean.



Until we realised exposure is not only a room-scale problem.



Because people move, equipment generates heat, and airflow changes locally.



So we designed a controller that reacts to local airflow near the patient.



Now the goal is not only a clean room, but a protected human microenvironment.

Why use it?

It replaces technical density with **cause and effect**.

Best for the general public and dissemination events.

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Claim–Evidence–Implication: for individual results

What should they believe? Why? So what?

HumanIC example

Local airflow control reduces airborne particle exposure near the surgical field.



Simulations and tracer-particle experiments show a X % reduction in exposure in the protected zone.



Operating-room ventilation should be evaluated at the human microenvironmental scale, not only at the room scale.

Where is it strongest?

Use it to structure
individual result slides.

It tells the audience how to read the result before they interpret it.

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Which narrative should I use?

There is no single right answer. A talk usually combines structures at different scales.

Scale / context	Recommended structure
Whole talk (any audience)	Problem–Tension–Resolution
Introduction	And–But–Therefore to establish context and tension
Technical core	Problem–Tension–Resolution to show the difficulty and the contribution
Individual result slides	Claim–Evidence–Implication
Dissemination / public	Pixar spine or simplified And–But–Therefore
Stakeholder conclusion	Problem–Tension–Resolution with an explicit call to action

The point is not to choose one structure and stick to it.

The point is to choose the **right structure for each communicative job**.

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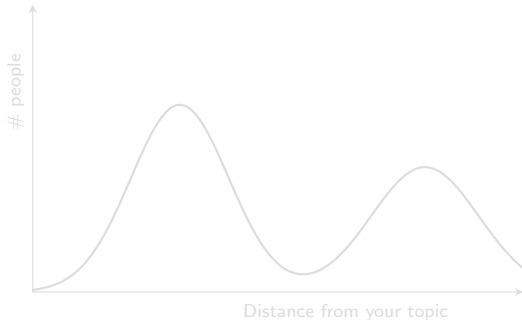
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How to handle a mixed audience

Mixed audiences often have different levels of distance from your topic



Talking to two groups at once risks reaching **neither one**.

A practical rule of thumb

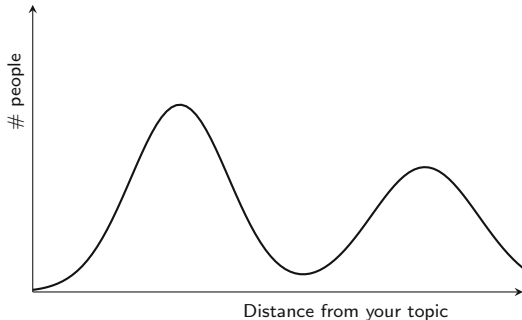
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Reserve **20 %** for the deeper technical points that specialists need.

Broad enough for all,
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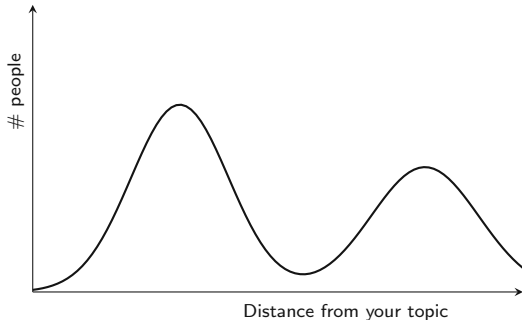
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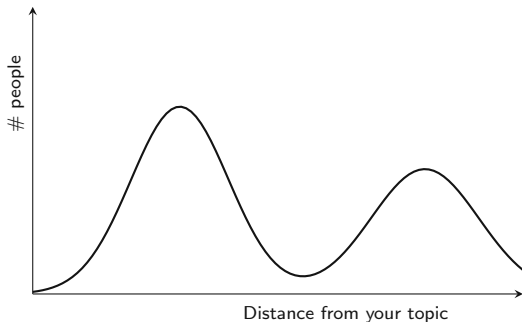
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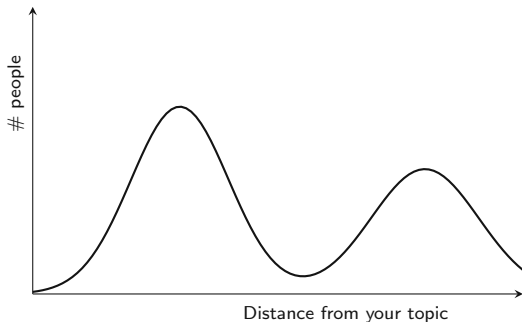
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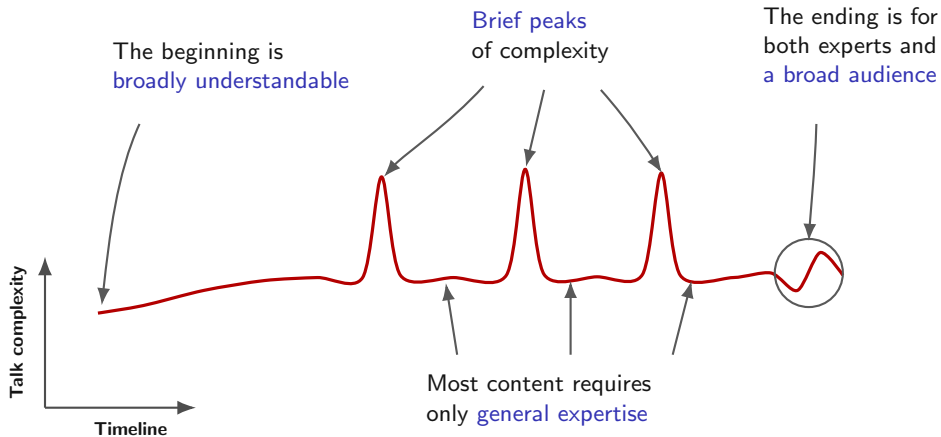
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A useful structure

Broad discussion with **brief, controlled peaks of complexity**



Part 3 of 3

How do you design your slides?

Focus attention · Reduce effort · Show evidence

Slides are not the presentation

Slides support the speaker.
They are not a substitute for the speaker.

The audience should follow **you**, not decode your slides.

Three design goals for every slide:

Focus attention · **Reduce effort** · **Show evidence**

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Focus attention: one slide, one message

Each slide should carry **one** main message.

Fewer slides is not automatically better.

The right question to ask

If I removed this slide, what would the audience *lose*?

Less is better only when it **preserves the intended transformation**.

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Focus attention: guide the eye deliberately

Size, colour, and contrast tell the audience **where to look**.

Focus attention: guide the eye deliberately

Size, colour, and contrast tell the audience **where to look**.

This is some context.

Your attention is here!

This is another detail.

This is a secondary explanation.

This is additional information.

Focus attention: guide the eye deliberately

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Your attention is here!

This is another detail.

This is a secondary explanation.

This is additional information.

Focus attention: do not turn your slide into a puzzle

Dense slides force the audience to *decode* instead of *listen*.

Avoid:

- ▶ equations presented without interpretation,
- ▶ figures dropped without context,
- ▶ notation assumed to be self-explanatory,
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Reduce effort: give the audience a map

A classic structural principle for reducing effort *across the whole talk*:

Tell them what you are going to tell them.

Tell them.

Tell them what you told them.

Repetition of structure, helps the audience build a map of where the talk is going and where it has been.

Not a universal law — some of the most memorable speeches break it. But for technical talks, it reliably reduces the audience's effort to follow.

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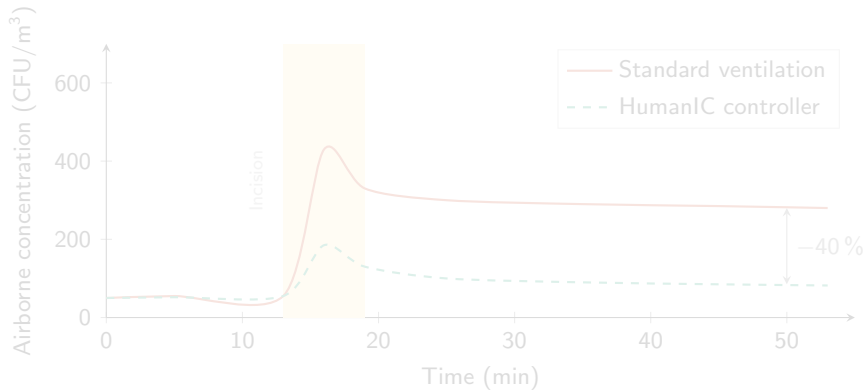
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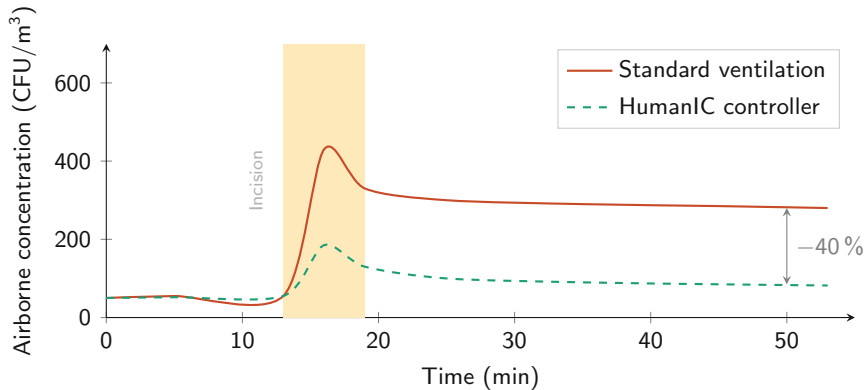
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Reduce effort: explain figures before you interpret them



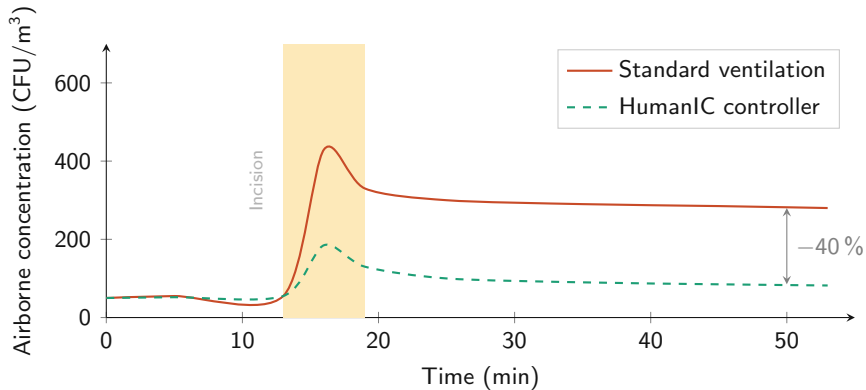
First, walk through the figure. Then state the result.

Reduce effort: explain figures before you interpret them



First, walk through the figure. Then state the result.

Reduce effort: explain figures before you interpret them



First, walk through the figure. Then state the result.

Reduce effort: attention is a limited resource

How many elements can an audience hold at once?

Miller (1956): 7 ± 2 items

Cowan (2001): 4 ± 1 items

Others suggest even **fewer**, depending on task complexity

The experts disagree on the number.
They agree it is small.

Every unnecessary element on a slide consumes working memory that should go to **understanding your argument** (*extraneous cognitive load*).

When in doubt: **remove an element** rather than squeeze it in.

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Make evidence visible: the title is a claim

A weak title *labels* the topic.

A strong title *states* the message.

Weak title

Simulation results

(What should I take away from this?)

Strong title

The controller reduces
contaminant exposure
near the surgical field

(The title *is* the message.)

The figure below the title should then **show the evidence for that claim.**

Make evidence visible: the title is a claim

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Three questions to ask about every slide

Does it focus attention?

One message. Visual hierarchy. No unnecessary elements.

Does it reduce effort?

Context before interpretation. At most 4/7 elements. Images only when they help.

Does it show evidence?

The title is the claim. The body is the proof.

If the answer to all three is yes, keep the slide.
Otherwise, revise it.

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Other considerations: jargon is efficient only when shared

Technical vocabulary is a shortcut —
but only if both sides have the same map.

Same-field audience

Jargon compresses meaning.
Use it freely.

*"The RANS-based model
was calibrated against
PIV measurements."*

General audience

Jargon creates distance.
Replace it or explain it.

*"We used a computer simulation
validated with real
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Other considerations: use metaphors to cross the knowledge gap

A good metaphor does not simplify the idea.
It *translates* it.

The same result — two audiences

To a scientist:

"The feedback controller uses real-time sensor measurements to regulate the local airflow field and minimise airborne particle exposure in the vicinity of the surgical field."

To a general audience:

"Imagine watering an entire garden just to keep one tree healthy. Our controller is like a smart irrigation system that delivers water exactly where it is needed, adapting as the soil dries or the weather changes. This is how our approach works."

A metaphor connects the topic to something the audience already knows.

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Other considerations: tone, pauses, and timing

Language is not only the words you choose.

- ▶ **Tone** should adapt to the audience.

Formal and precise with scientists; warm and direct with a general public.

- ▶ **Timing** reflects your priorities.

If you spend 70 % of the time on methods, you are signalling that methods matter more than impact. Budget your time to match the desired transformation.

- ▶ **Pauses** give the audience time to process.

A pause after a key sentence is more powerful than repeating it. [Link](#)

How you say something shapes what the audience **believes about it**.

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Summary

What to take away from today

The full design chain

Audience

Who are they? What do they know? What do they distrust?



The full design chain

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Who are they? What do they know? What do they distrust?



Desired change

What should they know, feel, believe or do at the end?



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Message

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Narrative

Which structure creates the right tension and path?



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Which words, tone, and metaphors fit this audience?



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Which structure creates the right tension and path?



Language

Which words, tone, and metaphors fit this audience?



Slides

One message per slide.
Focus attention, reduce effort, show evidence.

One sentence to remember

A presentation is not a transfer of content.

It is the design of a transformation
in an audience.

One sentence to remember

A presentation is not a transfer of content.

**It is the design of a transformation
in an audience.**

Final exercise: design a real presentation

Work in 4 groups. Choose one HumanIC-related topic:

- ▶ PhD thesis;
- ▶ a research problem you are currently working on;
- ▶ a scientific result you obtained;
- ▶ any other technical topic related to HumanIC.

Each group designs a different presentation scenario:

- | | |
|----------------|--|
| Group 1 | 8-minute talk at a large conference on a broad topic related to your work. |
| Group 2 | 10-minute talk in a small research colloquium close to your topic. |
| Group 3 | 10-minute dissemination presentation for a non-specialist audience. |
| Group 4 | 3-minute thesis-talk. |

Goal: adapt the same technical content to a specific audience, time constraint, and communication objective.

Final deliverable

Each group must produce:

1. A short description of the expected/target audience.
2. A one-sentence summary of the whole presentation.
3. A clear statement of what the audience should know, think, believe and do BEFORE and AFTER.
4. The number of slides you would use.
5. A title for each slide.
6. A one-sentence message for each slide.
7. A short description of what they would show on each slide (approximately).

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HINT

Before preparing any future presentation,
use this exercise as your to-do list.

It is a practical checklist
for designing your talk.

THANK YOU

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