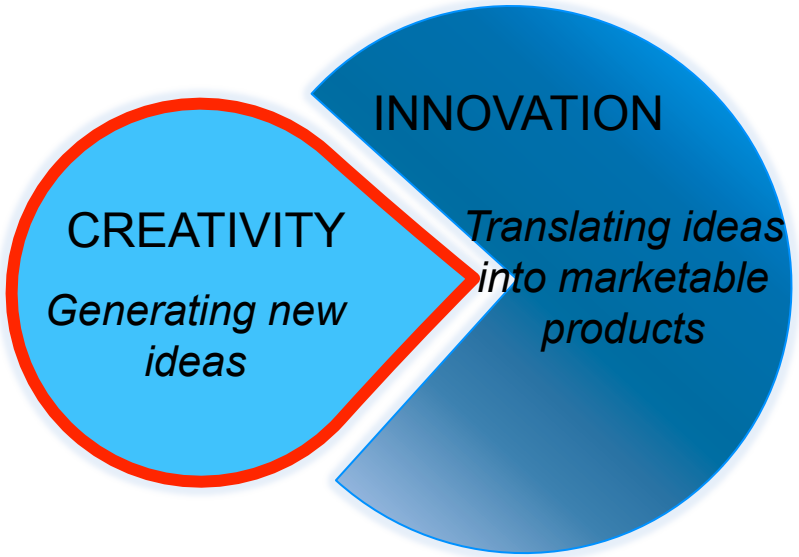
ESI 2019 Project Day – Ideation (Slides prepared by Thomas Bouvet, ESA)

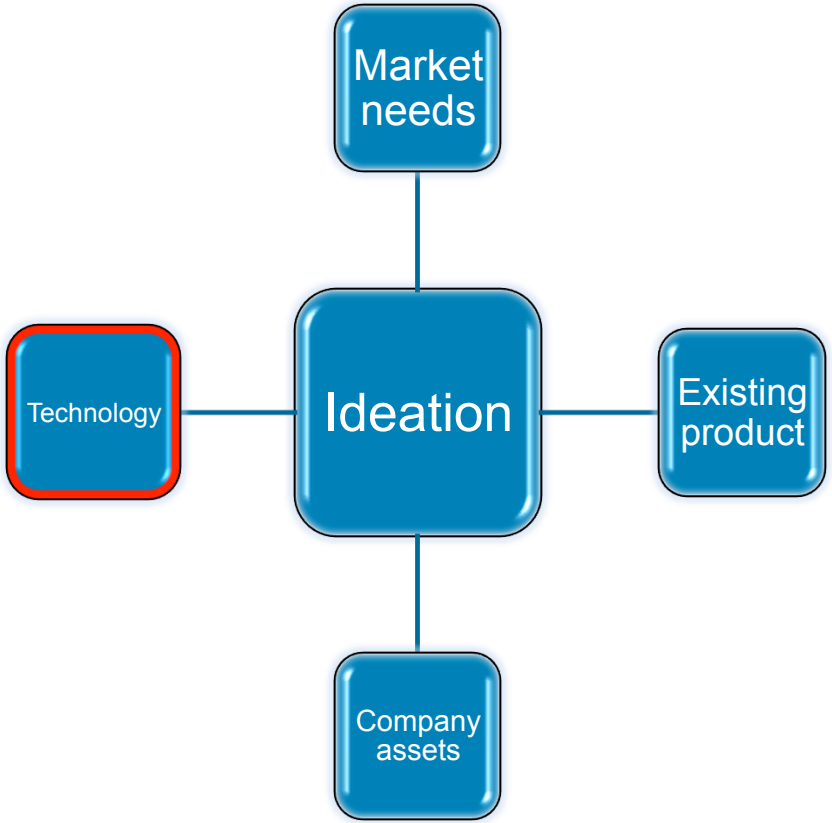
Objectives & contents

- ✓ The place of ideation in the innovation process
- ✓ Ideation: Where to start?
- ✓ How to ideate, alone and in a team
- ✓ Triz and canvas!

Ideation – What are we talking about?



Ideation – What are we talking about?



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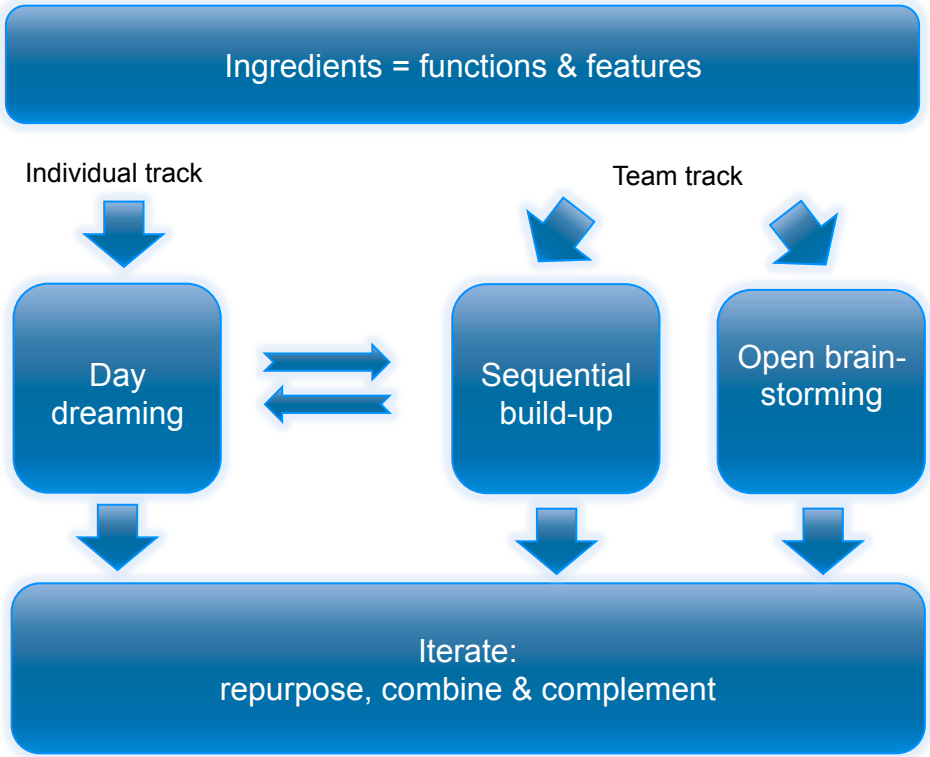
Process overview | outline



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STEP 1: The starting ingredients

Features

- Low weight
- Compact
- High stability
- Reliability (of deployment)
- Scalable & modular

Functions

- Fold and unfold
- Hold (stowed)
- Hold (deployed)

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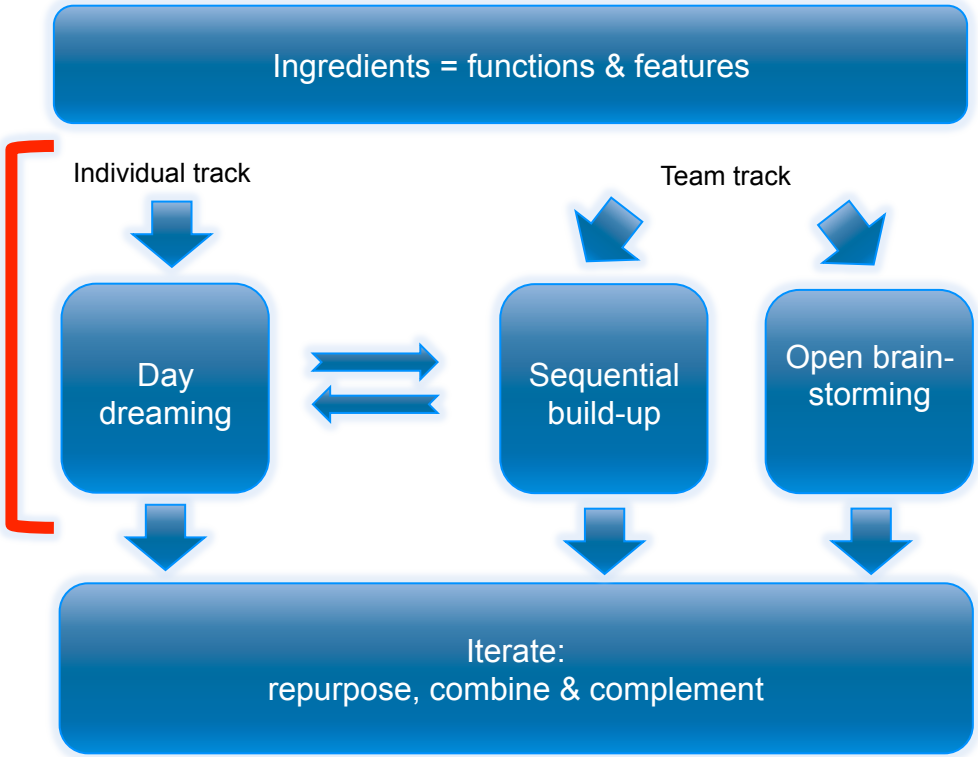
Process overview | outline



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Step 2: Ideate – 1st round (1/3)

1- Let ideas emerge spontaneously | e.g. sound selective distortion tech.







2- Cross match features & functions with usage scenarios.

@Home (when cooking / sleeping/…) – @office - @the factory – @travelling - etc…

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Step 2: Ideate – 1st round (2/3)

- **Team track: Work as a team, Build on each other's ideas.**

- **TT1: "Desk" sequential build-up**
  - Each team member write 3 ideas (use 3 post-its), and pass those post-its to a team mate.
  - Keep repeating until each team member has written an idea on each post-it

For example…

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Step 2: Ideate – 1st round (2/3)

Team track: Work as a team, Build on each other's ideas.

- **TT1: "Desk" sequential build-up**

Sequence 1: Products with **similar functions [PROTECT]**
in various contexts & use case scenarios




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Step 2: Ideate – 1st round (2/3)

Team track: Work as a team, Build on each other's ideas.

- **TT1: "Desk" sequential build-up**

  Sequence 2: Products used in the **same context [HOUSING]**, in various use case scenarios

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Step 2: Ideate – 1st round (2/3)

Team track: Work as a team, Build on each other's ideas.

- **TT1: "Desk" sequential build-up**

Sequence 3: Products with similar **feature [COMPACT]**

Of course, don't try to follow a logic… Just let ideas emerge. The logic of the sequence will change!

Step 2: Ideate – 1st round (3/3)

- **Approach B2: Open brainstorming approach** (open, random interactions)
  - Let ideas pop up randomly from people
  - 1 person speaks at a time
  - Number matters
  - No censorship, no criticism.

    NB: Seemingly stupid ideas are welcome too, as they can trigger other ideas!)
  - Build on each other's ideas
  - Stay focused on topic
  - Visualize ideas
  - You may organize by categories

    Use paperboard or display *mindmap*.

- Again, to facilitate the emergence of ideas, cross match various features & functions with contexts of use.

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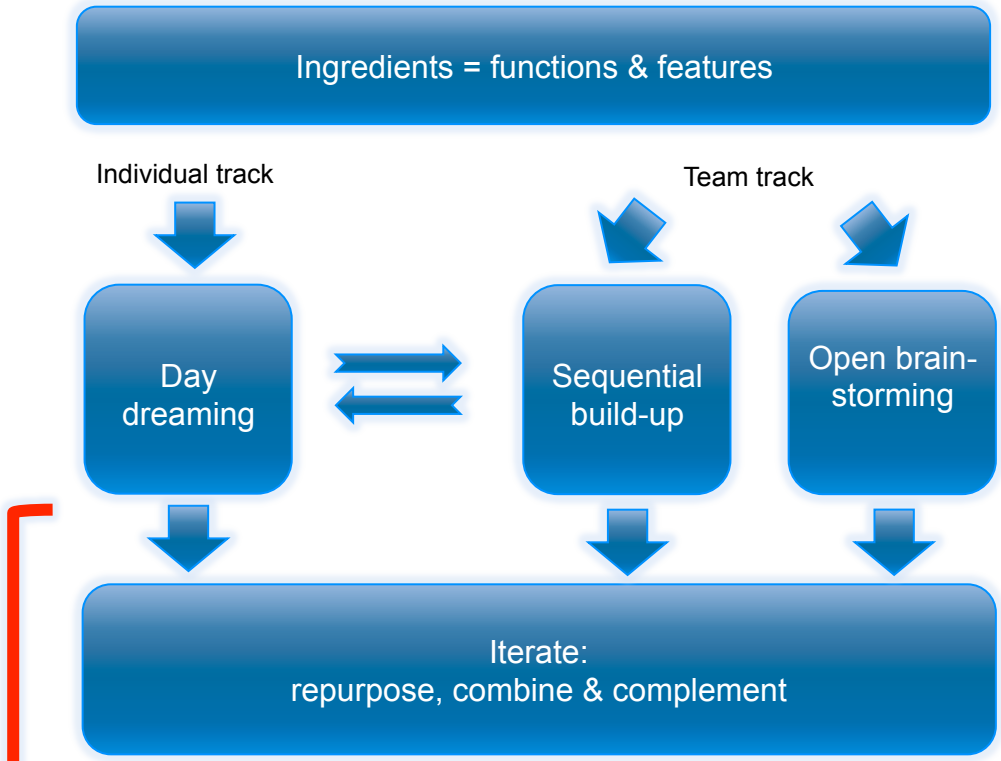
Process overview | outline



Step 3: Ideation – Second round

- **Change usage / context – repurpose**

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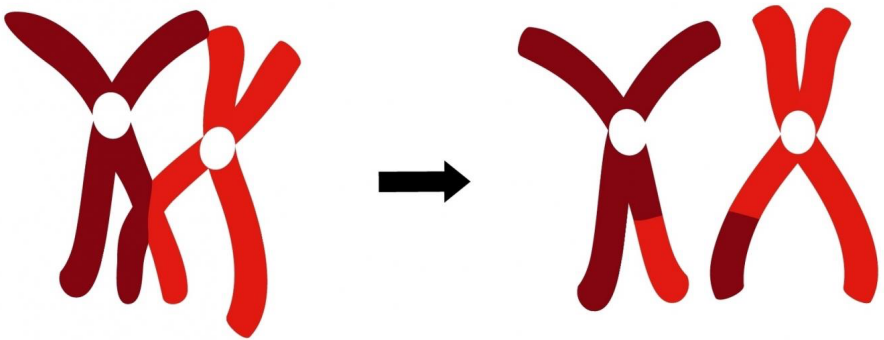
Step 3: Ideation – Second round

- **Combine products**



Step 3: Ideation – Second round

- **Combine products**

(look at products used in the same context)

+

Or motor to fold / unfold
Or new articulation mechanism for extra folding
Or sensor to warn elderly of obstacle…

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Stuck in a rut? Trapped in your mental box?

- Shake your body!
- Go for a walk, to the toilets, change scenery
- Go socializing, talk about anything else!
- Sleep over it

It will reset you, so you can start from a different place.

At the same time, your subconscious keeps working…

When you get back to it, suddenly you will have fresh new ideas. You may even have new ideas popping up without even thinking about it!

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TRIZ-methodology

Enabling inventive problem solving

TRIZ PHILOSOPHY

Get the water OUT

WITHOUT touching the glass

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TRIZ PHILOSOPHY

ABSORPTION
ACOUSTIC CAVITATION
ACOUSTIC VIBRATIONS
ARCHIMEDES' PRINCIPLE
BERNOUILLI'S THEOREM
BOILING
BRUSH CONSTRUCTIONS
CAPILLARY EVAPORATION
CAPILLARY PRESSURE
COANDA EFFECT
CONDENSATION
COLOUMB'S LAW
DEFORMATION
ELECTROCAPILLARY EFFECT
ELECTROOSMOSIS
ELECTROPHORESIS
ELECTROSTATIC INDUCTION
ELLIPSE EVAPORATION
FERROMAGNETISM
FORCED OSCILLATIONS
FUNNEL EFFECT
GRAVITY
INERTIA
IONIC EXCHANGE
JET FLOW
LORENTZ FORCE
MAGNOSTRICTION
MECHANOCALORIC EFFECT
OSMOSIS
PASCAL LAW
RESONANCE
SHOCK WAVE
SPIRAL
SUPER THERMAL
CONDUCTIVITY
SUPERFLUIDITY
SURFACE TENSION
THERMAL EXPANSION
THERMOCAPILLARY EFFECT
THERMOMECHANICAL EFFECT
ULTRASONIC CAPILLARY EFFECT
ULTRASONIC VIBRATIONS
USE OF FOAM
WETTING

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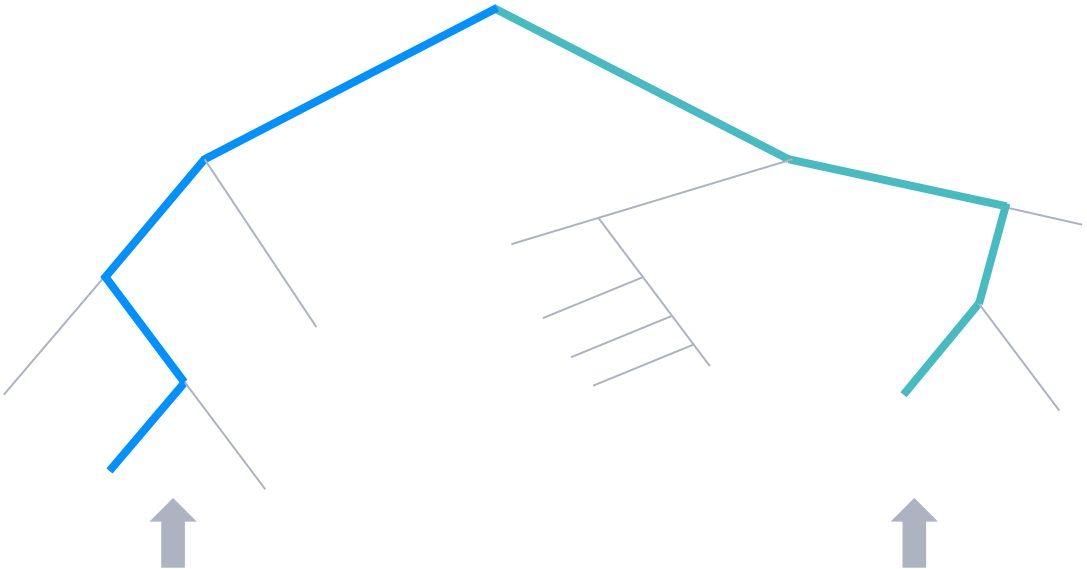
TRIZ Philosophy – Psychological inertia vector



YOUR TRAINING AND BIASES MAY BRING YOU DOWN THIS PATH

A BETTER SOLUTION MIGHT LIE OVER HERE

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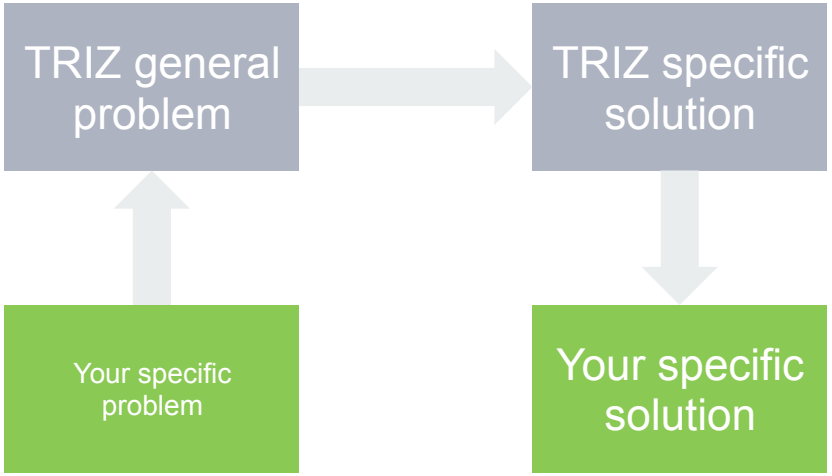
TRIZ Approach



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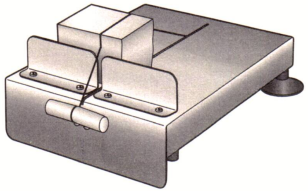
TRIZ Approach – Cross Industry Example

HOW TO CUT STICKY MATERIALS?



TRIZ general problem → TRIZ specific solution

Your specific problem → Your specific solution

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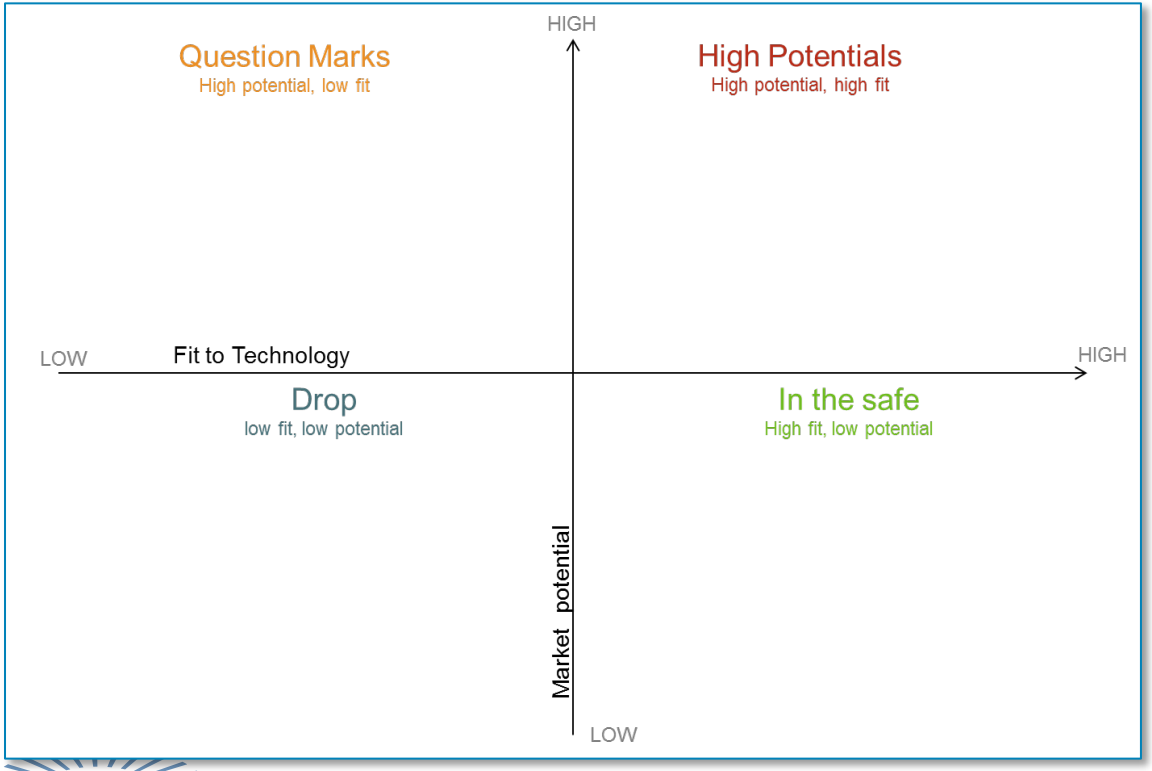
Quick Evaluations / Gut Feeling



- Compare cases to each other
- Can do some very quick lookups
- Ask for advice
- If not sure, start in the middle

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Thank you

Lluc Diaz (ESA)
IMKTT WG Chair EIROforum