



# Critical Trends shaping Science

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# Origin of this contribution (I)

- This contribution summarised the outputs of a research path under the FIT4RRI project
- The project is overall aimed at favouring the **spreading** and **institutional embedment** of Responsible Research and Innovation (RRI) within research organisations
- Actually, **RRI is less spread** than expected according to the same EU (see the SwafS Interim Evaluation Report)



## Origin of this contribution (II)

- Then the key question was: **Why is RRI less widespread, accepted, embedded** in research organisations than it was expected?
- To deal with this issue, a large literature review, a set of focus groups and a benchmarking exercise have been carried out
- This contribution try to summarise **what we understood** on this issue



# The contents in a glance

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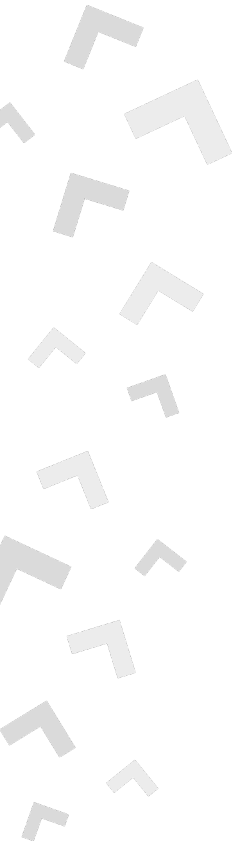
- **First step: a critical analysis of RRI**, as it has been conceived and its limits
- **Second step: a contextualisation of RRI** in relation to the transformations affecting science and science-society relations
- **Third step: an (alternative) interpretation of RRI** after the contextualisation process





➤ **STEP ONE**

➤ **A CRITICAL ANALYSIS OF RRI**





# Definitions

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- Many definitions have been developed on RRI, each time emphasising a mix of different components. Thus RRI can be understood as:
  - Mutual **responsiveness** between innovators and social actors (Von Shomberg)
  - **Responsibility** for the future impacts of R&I (Owen)
  - **Alignment** to R&I process and its outcomes to values, needs and expectations of European society (M. Georhean-Quinn)
  - **Reflexivity** on the (moral) acceptability of new technology and innovation (Van den Hoven)



# Keys and dimensions

- More practically, RRI is viewed as an **umbrella concept** including different keys and conceptual dimensions:
  - **Keys:** open access, gender equality, education, public engagement, ethical issues, governance, ...
  - **Dimensions:** responsiveness, inclusiveness, anticipation, reflexivity, care, .....



# Some common elements shared by the different views on RRI

- **An hidden assumption:** Science has been under-responsible or even irresponsible so far towards society; it is time to change!
- **A prescriptive approach:** RRI is to be adopted because it is right to do it
- **A focus:** The focus is on science-society relations rather than on science in itself
- **A common perspective:** Going beyond the Ivory Tower model



**IVORY TOWER MODEL**

- Science separated and autonomous from society, religion, politics

**RRI MODEL**

- Science fully embedded in society and connected with political, economics, and societal dynamics

**IVORY TOWER MODEL**

- Science separated and autonomous from society, religion, politics
- Science not involved with facts, worries and practicalities of society

**RRI MODEL**

- Science fully embedded in society and connected with political, economics, and societal dynamics
- Science sensitive towards and responsible for matching expectations, needs, worries and problems of society

<b>IVORY TOWER MODEL</b>	<b>RRI MODEL</b>
<ul style="list-style-type: none"> <li>– Science separated and autonomous from society, religion, politics</li> </ul>	<ul style="list-style-type: none"> <li>– Science fully embedded in society and connected with political, economics, and societal dynamics</li> </ul>
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<ul style="list-style-type: none"> <li>– Science not involved in the actual implications and use of its outputs</li> </ul>	<ul style="list-style-type: none"> <li>– Science directly concerned with the actual implications and use of its outputs</li> </ul>

# Potentials of and barriers to RRI

- **RRI concept is powerful** (because of its interpretive flexibility), **trendy** (see “responsible eating”, “responsible religion”, “responsible mobility”, etc.) and **capable to mobilise people**
- **RRI is little known, conceptually vague and variably interpreted** (policy-oriented interpretations, ethical interpretations, personal commitment-based interpretations, déjà-vu syndrome, etc.).
- **There are strong institutional barriers to trigger RRI.** Institutional spaces, support and orientation are limited.
- **Cultural and social barriers also influence.** Disciplinary cultures, professional cultures, different views of science and scientists

# ◆ A set of questions

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These considerations lead us to a set of questions:

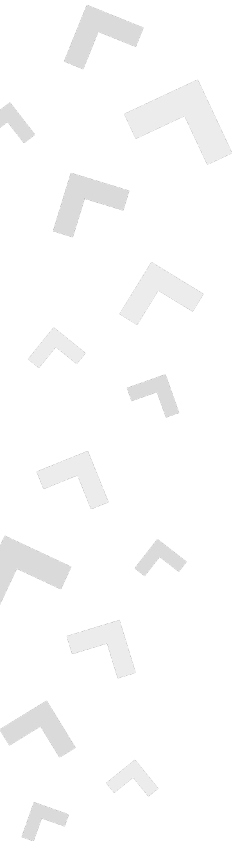
- **Why now?** i.e., why have the concept and the debate on RRI been developing just in the last decade?
- Which is the **theoretical background** of RRI?
- Which is the **context of changes** which RRI is immersed in?





➤ STEP TWO

➤ A CONTEXTUALISATION OF RRI



# Theoretical background


- RRI is based on a set of **interpretive models** of the change affecting science developed between the 80s and 90s, such as:
  - The **Mode1/Mode2** model (Scott, Gibbons, Nowotny)
  - The **Post-Academic science** (Ziman)
  - The **Triple Helix Approach** (Leydesdorff, Etzkowits)
  - The **Post-normal Science** (Funtowicz, Ravetz)
  - The **Innovation Systems** model (Lundvall)





# How science as social institution is changing?

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- Science as a **multi-actor process** involving many lay actors
- Increasing **political steering** of R&I
- Focus on **social and economic benefits** of R&I
- **Decreasing authority** of and the **increasing** people's **distrust** in R&I
- Increasing demand for **accountability and public scrutiny** of research process and products
- **Blurring boundaries** (among disciplines, roles, responsibilities, epistemes) 

# ◆ A broader framework (I)

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- These changes in R&I can be understandable only recognising it as part of the general **shift from modernity to late modernity** affecting all social institutions of modernity (politics, State structures, religions, etc.)
- This shift can be understood as a modification in the balance between **social structures** and **agency**, whereas:
  - **Social structures** → dominant patterns of action and social relationships, legitimated by cultural and cognitive patterns
  - **Agency** → capacity of people to think and act more autonomously from social structures while trying to either change them or to prevent their change



# ◆ A broader framework (II)

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- In **modern mass society**, **social structures were more able to limit individuals' agency**, which were embedded in intermediate organizations and ideologies; adopting unconventional behaviors and ideas was difficult and socially risky
- In **late modern society**, different factors (e.g., increased access to education, goods, rights, mobility and personal technologies) **allow individuals to express a change-oriented or anyway autonomous agency** opposing or neglecting social structures; now the problem is defining which are the conventional behaviours and ideas
- The **main output**: diminishing capacity of social structures to shape social life



# ◆ A broader framework (III)

- This shift led social institutions of modernity to **critical transformations**, including:
  - **Diminishing authority** and **social status**, leading to controversies and demands for transparency and accountability
  - Declining and increasingly **uncertain access to resources**
  - Increasing **public indifference, disaffection** or even **distrust**
  - **Destandardisation** and **fragmentation** of internal mechanisms and **lack of internal unity**

# A key issue

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- All these changes are making social institutions of modernity **socially weaker**; and this is occurring also in **science**
- There are many observers highlighting that the changes occurring in politics are endangering democracy; others are highlighting that changes occurring in the labour system are endangering the labour rights
- Thus the key question is: **are changes occurring in research and innovation endangering science** (the quality of its process, products and advancements)?



# Changes affecting science (which RRI literature tends to ignore) (I)

- **Hypercompetition** and **accelerated pace** of the research process
- **Structural shrinking of research funds** in a context of increasing costs of research activities
- **Task diversification** and decreasing time devoted to scientific work
- **Increasing staffing** combined with growing use of PhD students and postdocs, mainly paid through research grants



# Changes affecting science (which RRI literature tends to ignore) (II)

- **Segmentation and polarization of the staff** on the basis of age and contractual status leading to, e.g., overexploitation and overtraining of young researchers, decreasing quality of teaching, changes in the labour relations and modifications in the researchers' identity
- **Increasing mobility of researchers**, with impacts on the quality of living and on gender equality
- **Decreasing quality of research outputs** as mirrored by, e.g., crisis of reproducibility of scientific data (according to various sources, 60 to 80% of laboratory data are not reproducible), production of redundant or irrelevant publications, increasing diffusion of malpractices➤



# Changes affecting science (which RRI literature tends to ignore) (III)

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- **Decreasing reliability of research assessment**, due to a diminishing quality of peer review combined with a questionable use of quantitative indicators and rankings
- **Governance shift** with an enlarging adoption of entrepreneurial models leading to a high diversification of governance approaches
- **Increasing openness of research institutions toward external actors** with beneficial but also risky impacts on the life of research organisations.

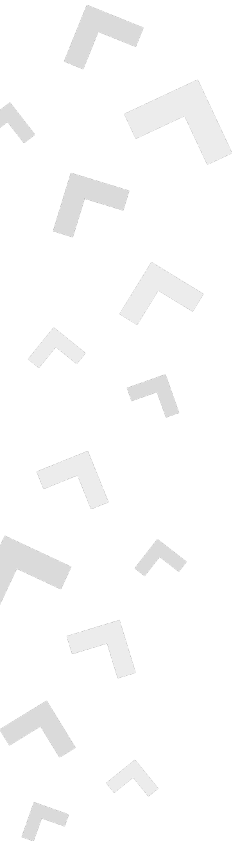






➤ STEP THREE

➤ AN INTERPRETATION OF RRI



# Summing up: the context

- A **transition** in science is occurring
- These changes **are already modifying** the way in which research organisations and research systems work
- These changes are affecting, not only science-society relations, but the **intimate mechanisms of science** (internal organisation, laboratory work, labour division, research quality assessment, etc.)
- These changes are **critical** in the sense that they both endanger science and open to new opportunities for making science in a different and most effective way



# RRI as a policy reaction

- RRI is **one of the policy reactions** to the transition of science
- RRI is still a **feeble policy framework**, for different reasons (conceptual vagueness, excess of prescriptive view, lack of symbolic structures, etc.)
- **Signals of it** are, e.g., lack of knowledge about RRI, lack of interest, lack of action, perception of RRI as a “super-structure” or a set of obligations, presence of cultural and institutional barriers
- However, the cases studied under FIT4RRI show that RRI **could have major impacts** on research organisations. Some orientations can be done



# Enhancing RRI (I)

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- A. Shifting from a prescriptive to a problem-solving approach to RRI:** RRI should be implemented not only because it is right but because it is useful to solve the problems researchers and research organisations are already facing and worried about
- B. Using RRI for facing all the changes affecting science:** thus, not only “external relations” but also the “domestic affairs”, including the many critical changes affecting the production of scientific knowledge and taking them seriously



## Enhancing RRI (II)

- C. Tailoring RRI:** RRI can be a source of inspiration, a cultural background or a stock of knowledge; however RRI only exists when someone start using it to manage the transformations in R&I, as they manifest themselves in a given research organisation; each research organisation should develop a tailored version of RRI, starting from an analysis on how RRI could be helpful for solving problems and saving time
- D. Focusing on actors:** a mere normative approach to RRI does not work; norms, protocols, guidelines can be important; but they needs for brains, passions and hands of people allowing it to go forward



## Enhancing RRI (III)

- E. Consider RRI as a process, not a project:** RRI is aimed at producing institutional changes, which cannot be understood as simple projects to implement, rather than more complex processes the development of which can be only partially driven, because of the many resistances, barriers, conflicting interests and social constraints
- F. Monitoring changes:** understanding how the transitional process affecting science develop over time should be a primary need for research organisations, also in order to modify their own approach to RRI
- G. Avoiding ideological views:** RRI may also disappear in the future but the problems it faces and the need for solutions remain



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# Thank You

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