

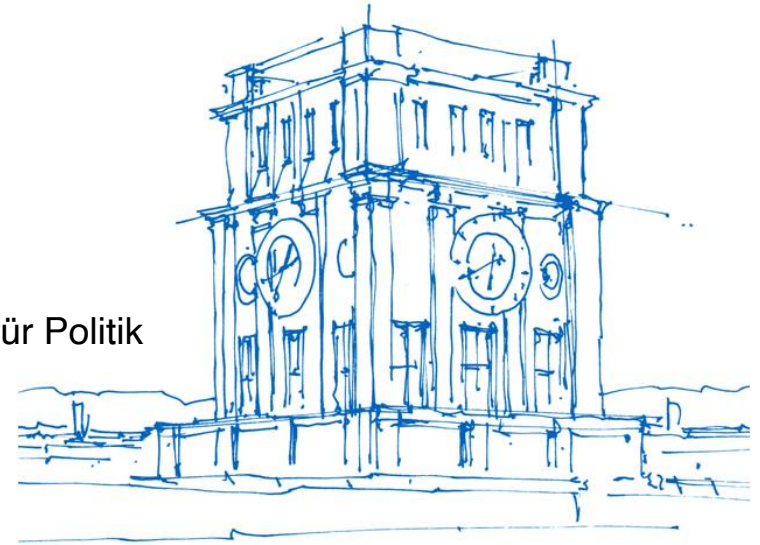
## Supporting Resilience Through the Use of Open Source Software and Open Standards

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*Uhrenturm der TUM*

- This presentation is based on the TRIGGER (**T**rends in **G**lobal **G**overnance and **E**urope's **R**ole) study for the EU's Horizon 2020 Program, conducted by 14 partner institutions.
- One of the main goals of the study is to understand how global governance and emerging technologies interact, and what role the EU plays in this respect, in particular as “regulatory superpower.”
- The Technical University of Munich (TUM) focused on reviewing current governance regimes and EU initiatives concerning open standards and open source software (OSS).
- My co-author, Prof. Tim Büthe, and I draw three main conclusions in our study:
  - OSS and open standards can contribute to more interoperability, especially if OSS developers implement application programming interfaces (APIs) that are based on open standards.
  - To solve the conundrum between requiring complete openness and incentivizing investments in research & development (R&D), policymakers should mount a multi-stakeholder effort to redefine fair, reasonable and non-discriminatory (FRAND) licenses and potentially adopted a tiered system of licensing fees
  - As regards geopolitics, the promotion of OSS and open standards can be a powerful tool for states to improve their economic and political positions vis-à-vis their rivals.
- Our study is available at <https://trigger-project.eu/deliverables/>.

# Poll Questions



- Do you think governments are more resilient now than they were 30 years ago?
- Do you think the use of open source software and open standards increases governments' resilience?

# Risks and Opportunities of New Technologies



- New technologies are an essential driver of economic growth.
- At the same time, they can pose risks to humans, animals, and the environment.
- These risks include *known knowns*, *known unknowns*, and *unknown unknowns*.
- New technologies therefore raise complex challenges for policymakers.
- This situation is complicated even further by so-called *dual-use* technologies.

# The Precautionary Principle



- The Precautionary Principle is detailed in Article 191 of the Treaty on the Functioning of the European Union (TFEU).
- It was first applied in the field of environmental protection and advises risk prevention in the face of scientific uncertainty.
- Over the years, the scope of the precautionary principle slowly widened to include consumer policy, food, and human, animal, and plant health.
- Questions have arisen in recent years about the scope of the precautionary principle - is the public demanding the (unattainable) goal of zero risk?

# The Innovation Principle



- While zero risk may seem desirable, there is a complex relationship between reducing risk and fostering innovation (and thereby economic growth) that policymakers need to take into account.
- Given the European Union's comparatively weak position in the global technology industry, some have suggested that EU regulators should apply the precautionary principle to a much narrower range of cases and counterbalance it with the so-called *innovation principle*, drafted in 2016 as part of an initiative to establish better regulations.
- A much-needed counterweight to the precautionary principle, the innovation principle holds that the Commission will take innovation into account when drafting new initiatives, acknowledging that in order to have an innovative society and a growing economy, one needs to accept a certain amount of risk.

# Resilience: A Way to Bridge Precaution and Innovation



- The innovation principle should not be used to move away from precaution and adopt a regulatory laissez-faire approach that exposes EU citizens as well as animals and the environment to a high amount of risk in order to foster innovation.
- In recent years, more and more scholars and policymakers have suggested that *resilience* is an important concept for striking a balance between precaution and innovation.
- The resilience perspective acknowledges that not all risks of new technologies can be anticipated – but instead of responding to this fact by calling for strict regulations governing the use of new technologies, the resilience perspective advocates the creation of societies that can absorb future shocks stemming from technological innovation.

# The Three Capacities Underlying Resilience



- The OECD states that investing in three different types of capacities can strengthen resilience: absorptive capacity, adaptive capacity, and transformative capacity.
- **Absorptive capacity** refers to the ability of systems to use predetermined coping functions in order to preserve and restore basic structures and essential functions in the face of negative impacts.
- **Adaptive capacity** refers to a system's ability to change its structures and functions in order to take advantage of future opportunities and mitigate the impacts of potential negative events.
- **Transformative capacity** refers to the ability to create an entirely new system if the old system ends up becoming untenable.



# Supporting Resilience Through the Use of Open Source Software and Open Standards



- Resilient societies are agile enough that they can handle the changes and shocks stemming from the introduction of new technologies (and other events).
- Open standards and open source software can support agility by making it easier for public policymakers to be quick and adaptive – a necessity in today’s fast-changing world.
- If a “shock” event happens, the use of open standards and open source software contributes to all three dimensions of resilience.

# Absorptive Capacity



- When it comes to absorbing the impacts of the shock, open standards and OSS are helpful because they allow governments to make quick changes to important technological applications and infrastructure.
- OSS gives organizations control over the technology they are using and allows them to adapt it as needed, at least if they have the right in-house resources, most importantly enough highly skilled developers, to mount a fast and effective response.
- The use of open source software and open standards also makes governments' technological infrastructure more secure, transparent, and flexible in the first place.

# Adaptive Capacity



- The use of OSS and open standards also allows governments to adapt in response to the longer-term effects of shocks, thus contributing to their adaptive capacity.
- OSS and open standards enable many different players to be involved in the development of new technologies, leading to more innovation, a faster pace of change, and better adaptation to varying real-world needs.
- Moreover, the use of OSS and open standards enables actors in the relevant technology ecosystem to adopt reusable components, open APIs, and open interfaces into platforms and solutions, potentially increasing the to-market rate of new products and services.
- This means that governments may have a larger menu of options to choose from, leading to more competition and therefore to lower prices, making it easier to adapt as needed.

# Transformative Capacity



- As regards the third dimension of resilience – transformative capacity – OSS and open standards can similarly help to ease the transition to new technological solutions.
- As in the case of adaptation, the use of OSS and open standards can lead to more innovation at a faster pace. This, in turn, can reduce the time and cost of transformation efforts.
- Is the particular innovation model that is often associated with open standards and OSS suitable for producing the radical innovations required for technological transformation?
- It's debatable – but it should be noted that the *breakthrough ideas* required for real transformation might be generated more easily by a global developer community than a (comparatively) small group of employees working on proprietary technology.

# To Sum Up



- Given today's fast-paced technological change, governments need a way to bridge precaution and innovation to harness the potential of new technologies while minimizing their risks.
- Improving the resilience of governments – and of society at large – is an important concept for striking a balance between precaution and innovation.
- There are three capacities underlying resilience: absorptive capacity, adaptive capacity, and transformative capacity.
- The use of open source software and open standards in government can strengthen all three of these capacities and therefore contribute to more resilient governments and societies that can respond well to the shocks created by the adoption of new technologies.

Happy to receive questions and comments and / or  
connect...



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