

Why we need

# Risk Innovation

Thinking differently about risk in an increasingly complex, coupled, and precarious world

Andrew Maynard

Why is risk important?

How good are we at  
handling emergent risks?

# Natural Language Processing, Internet of Things, Public Domain Hard/Software, Cloud Computing

A company develops a home-use natural language processor that constantly monitors conversations, anticipates needs, intelligently manages everything from home appliances and HVAC systems, to lighting and home security. It also provides you with advice, almost before you know you need it.

The device uses open access hardware and software, cloud-based data processing, and public domain Internet of Things control protocols. It collects audio, video and other signals from your home, and uploads them to cloud-based agents. These process the data, and return instructions to internet-connected systems in your home.

Data storage and processing is globally distributed, and entrepreneurs around the world are able to develop their own upgrades and add-ons to the system.

# Artificial Intelligence, Gene Editing, Bio-hacking, Data Sharing, Gene Drives

A US entrepreneur decides to re-design crabgrass into a useful plant. They find online services that uses AI-based systems to redesign plant genomes, and provide fool-proof “recipes” for modifying organisms. These “recipes” are big on achieving results with limited access to resources, using technologies such as CRISPR.

The entrepreneur hooks up with a biohacker community to realize their dream of a new, improved crabgrass. They decide to make their IP and the processes they use open access.

Someone in the group discovers an online group that develops hardware and biological “hacks” to carry out gene drives on a shoestring budget.

Working with a loose group of partners, the entrepreneur decides to initiate an uncontrolled gene drive that is intended to transform crabgrass from a weed into a commodity.

# Virtual Reality, TMS, Nanotechnology, Gaming, Cognitive Enhancement, Connected Brain

A researcher combines advanced Virtual Reality (VR) with Transcranial Magnetic Stimulation (TMS) in online gaming, to enhance the gaming experience. He launches a Kickstarter for his new “connected brain VR gaming system” that enables the game environment to influence the neurological state of players.

Gaming enthusiasts co-opt and further develop emerging iron-based nanoparticle technologies that can enhance the TMS experience by accumulating in targeted parts of the brain and amplifying the TMS signal.

Gaming communities around the world begin developing platforms that allow immersive neurological experiences and game-plays using the combined technologies.

Hackers begin to explore how they can directly influence and manipulate gamers who are “plugged in” to the net.

## Complexity

The future will be far more complex than anything we've previously experienced in human history

## Coupling

Individuals, society and technology are more tightly coupled than ever before, leading to increasingly rapid, uncertain and impactful consequences to actions

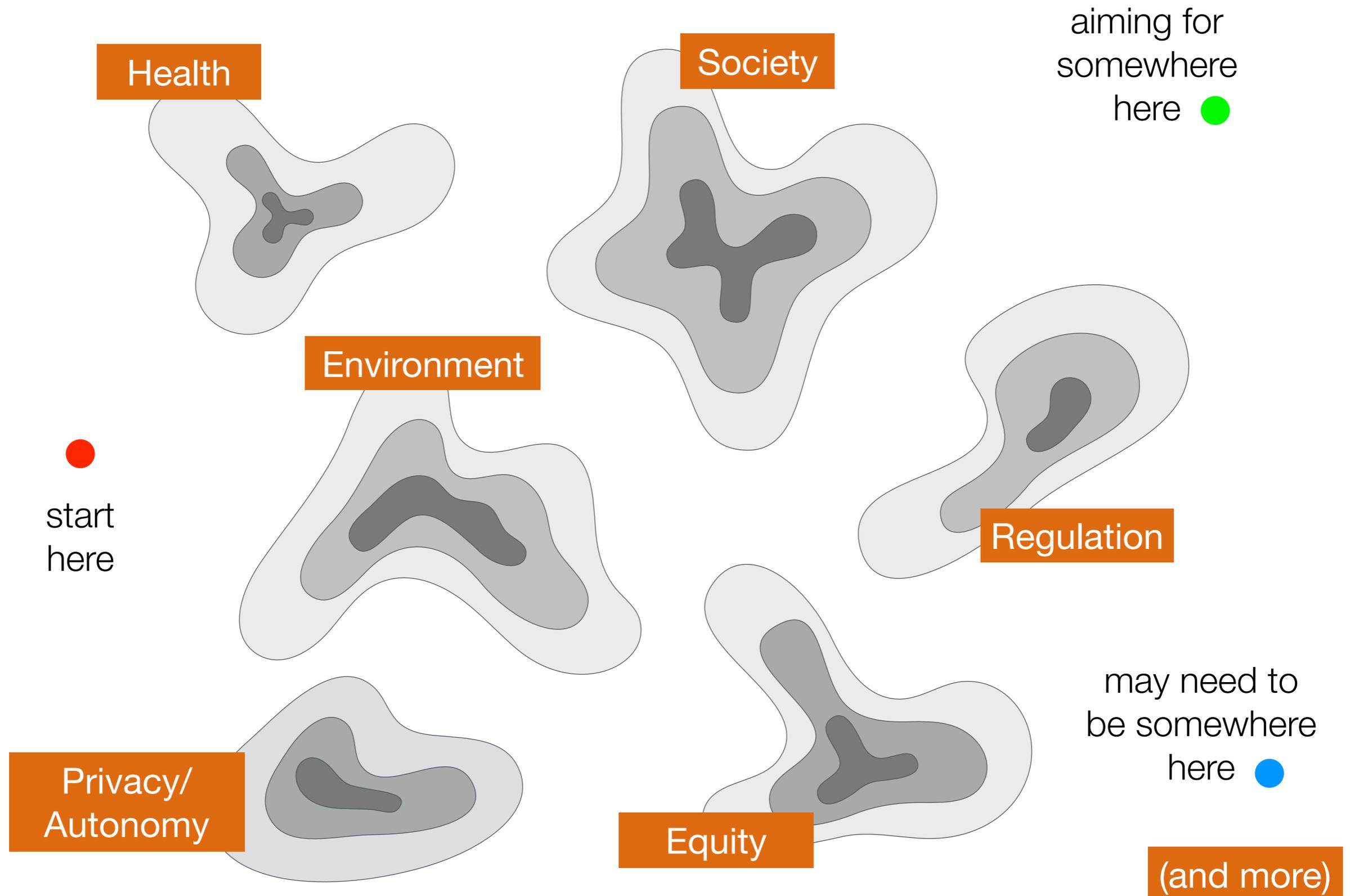
## Novelty

The likelihood of unusual, interconnected, and potentially catastrophic risks is accelerating

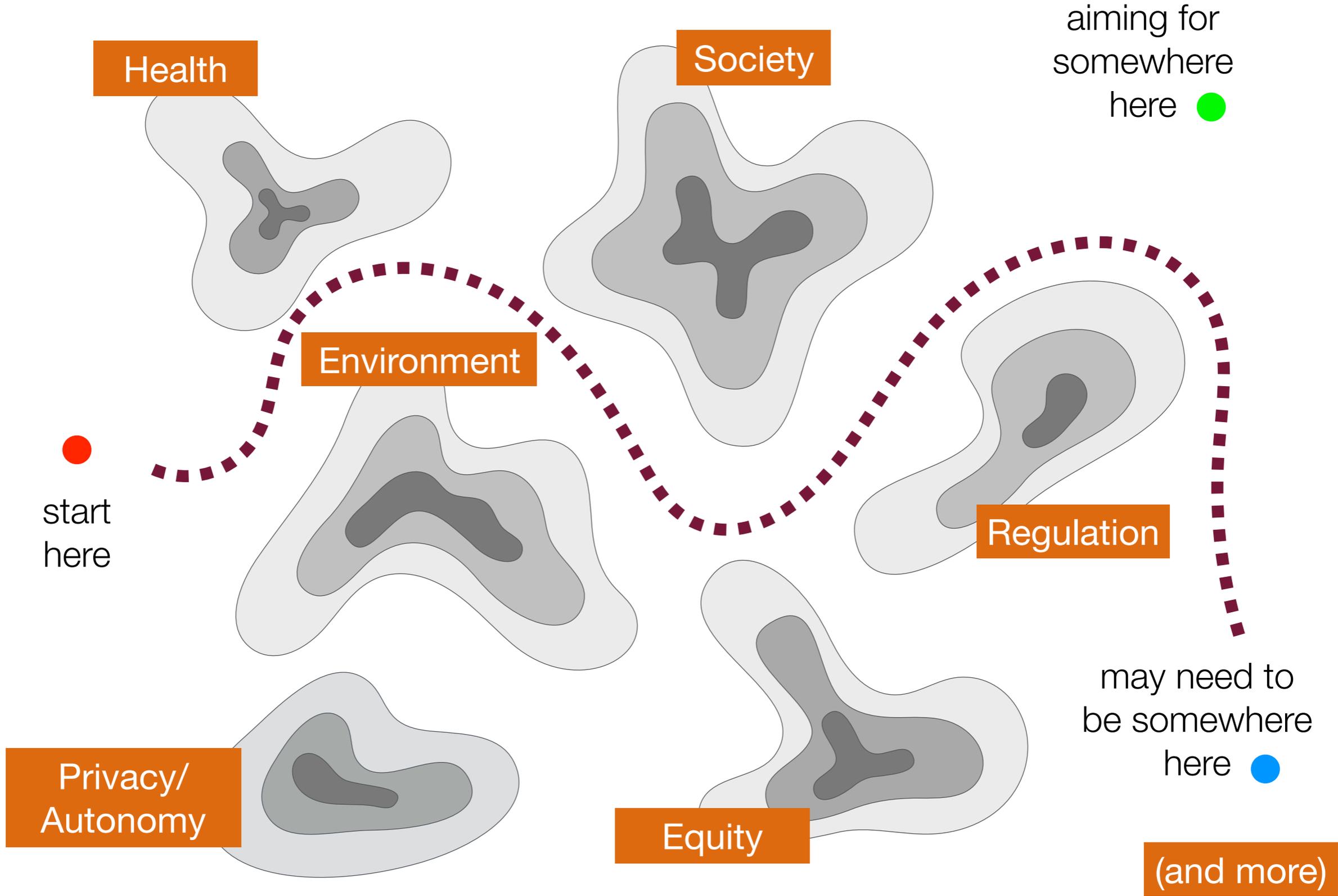
## Inadequacy

How we are taught to conceptualize risk, analyze it, and manage it, ill-equips us for navigating a rapidly-changing risk landscape

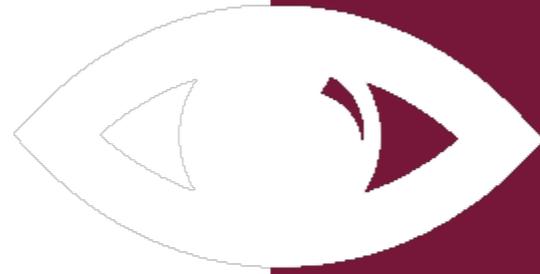
# Risk Landscape



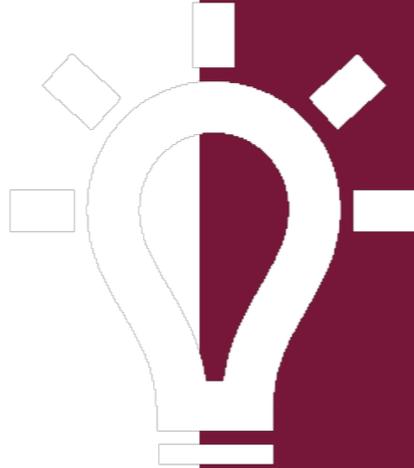
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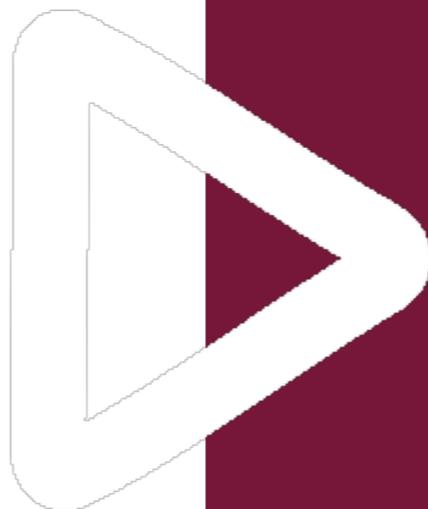
# Risk Innovation



**SEEING DIFFERENTLY** Exploring new ways of seeing the risk landscape; connecting diverse and often seemingly-disparate ideas, experiences and perspectives; opening the door to serendipitous discovery



**THINKING DIFFERENTLY** Developing new and creative perspectives on risk that reveal novel insights into seemingly intractable problems. Drawing on transdisciplinary expertise and perspectives to help understand old and emerging challenges in new ways



**ACTING DIFFERENTLY** Connecting new ways of seeing and thinking about risk to novel actions that protect value, reduce value deficits, and potentially lead to the creation and growth of value.

# Reconceptualizing Risk

Approaching risk as a threat to “value” that results from a decision, action, or process.

Value (not to be confused with “values”) is defined here by individuals, groups, organizations, or society more broadly.

It covers the full spectrum of ideas, beliefs, dreams, expectations, rights and desires that make up humanity.

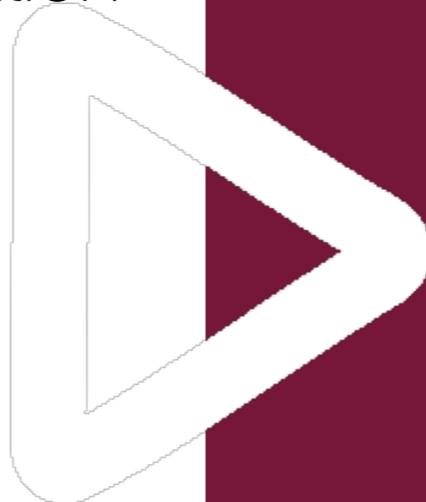
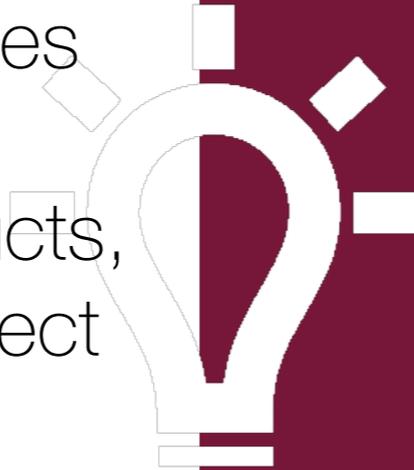
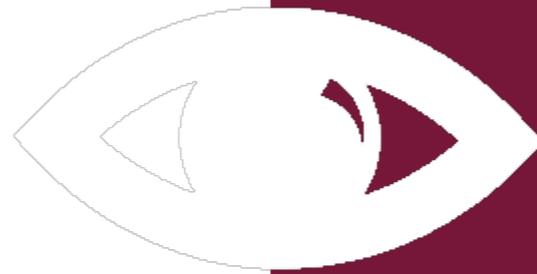
“Threat” implies the likelihood of a reduction in, corruption of, or elimination of value. Risk to one value may lead to an increase in another value.

# Rethinking Innovation

The process of developing new understanding, insights, and inventions, and translating these into tools, products, and practices, that lead to transformative value creation and growth.

# Risk Innovation

An organizing framework for generating new knowledge, understanding, or capabilities with respect to risk, and translating these into products, tools, or practices that protect societal, environmental, economic, and other value, as well as enabling value creation and growth



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# Guiding Principles of Risk Innovation

## Risk as Threat to Value

Approaching risk as a threat to existing or future “value”, where value is broadly and multiply defined within interdependent personal, societal, environmental, and/or corporate contexts.

## Knowledge to Practice

Generating new knowledge, understanding, or capabilities, and translating these into products, tools, or practices that protect or maintain value, and/or lead to an increase in or creation of value.

## Creativity

Exploiting the serendipity that comes from the exercise of creativity, imagination, and eclecticism.

# Responsible Technological Innovation

## Seventeen Haiku

Ripples reverberate

Dreams and nightmares  
awake

Who is responsible?



# The Fourth Industrial Revolution

“Today we are in the midst of the Fourth Industrial Revolution, which will affect governments, businesses and economies in very substantial ways. We should not underestimate the change ahead of us...”

Klaus Schwab  
Founder and Executive Chairman, World Economic Forum

<https://agenda.weforum.org/2015/10/will-the-fourth-industrial-revolution-have-a-human-heart-and-soul/>



# Toxicology Testing in the 21st Century

[Manufacturers and regulators] need something better - something faster, something cheaper, and ideally something that doesn't involve using so many animals”

Maynard/Risk Bites

“Tox21 researchers aim to develop better toxicity assessment methods to quickly and efficiently test whether certain chemical compounds have the potential to disrupt processes in the human body that may lead to negative health effects.”

EPA

<http://www2.epa.gov/chemical-research/toxicology-testing-21st-century-tox21>



<https://youtu.be/vKhn1HRXgn8>

# Risk Innovation Lab

**Risk innovation:** an organizing framework for generating new knowledge, understanding, or capabilities with respect to risk, and translating these into products, tools, or practices that protect societal, environmental, economic, and other value, as well as enabling value creation and growth



**TECHNOLOGY INNOVATION** Understanding and addressing risk challenges at the intersection between emerging technologies and society



**USERS** Enabling and empowering users of products and technologies to make informed decisions -on risks, benefits and tradeoffs



**WELL-BEING AND HEALTH** Exploring innovative approaches to improving the health and well-being of individuals and communities



**IMAGINED FUTURES** Mapping out an evolving and increasingly complex risk landscape through creative exploration of plausible futures



**CONVERSATIONS** Creating the means for effective engagement between constituencies and stakeholders in reducing risk and increasing value



**GOVERNANCE** Studying and developing innovative approaches to reducing risk through effective policy and governance

# Conversation Starters

Are we facing a crisis of imagination in the face of emergent risks?

Are emergent risks really pushing us beyond the bounds of conventional risk analysis?

Do creativity and creative play have a legitimate role in addressing risks?

To what extent do we need to develop new approaches to convergent/coupled risks?

How can well-trained professionals be jolted out of institutionalized risk-ruts, so they can see new possibilities in navigating an evolving risk landscape?

How can the practices of technology innovation be adopted to develop anticipatory and responsive approaches to emergent risks?



# Risk Innovation Lab

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