

# Science is everywhere

That's why you can't leave it to the  
scientists alone.

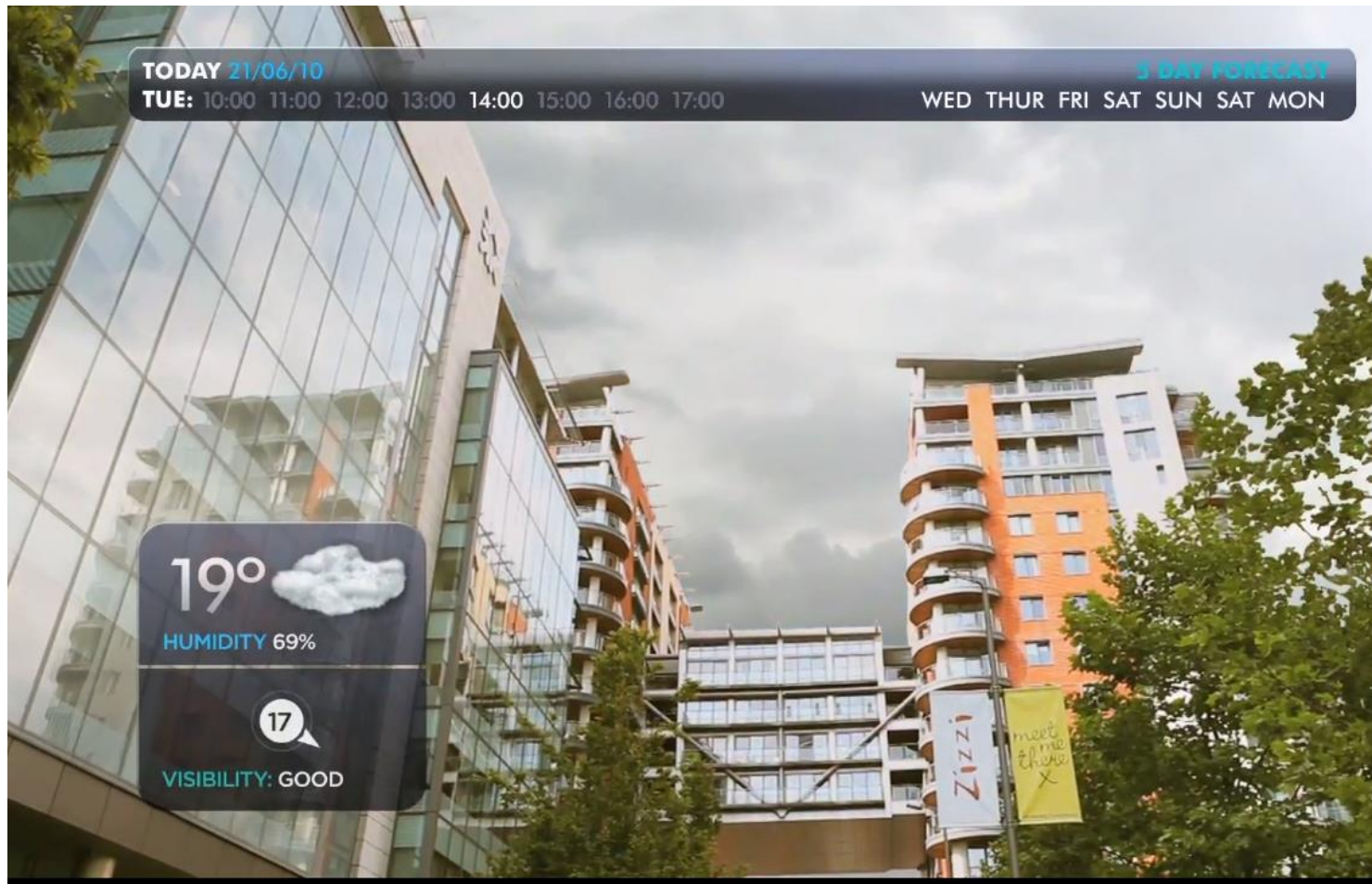
# Change is good (maybe)



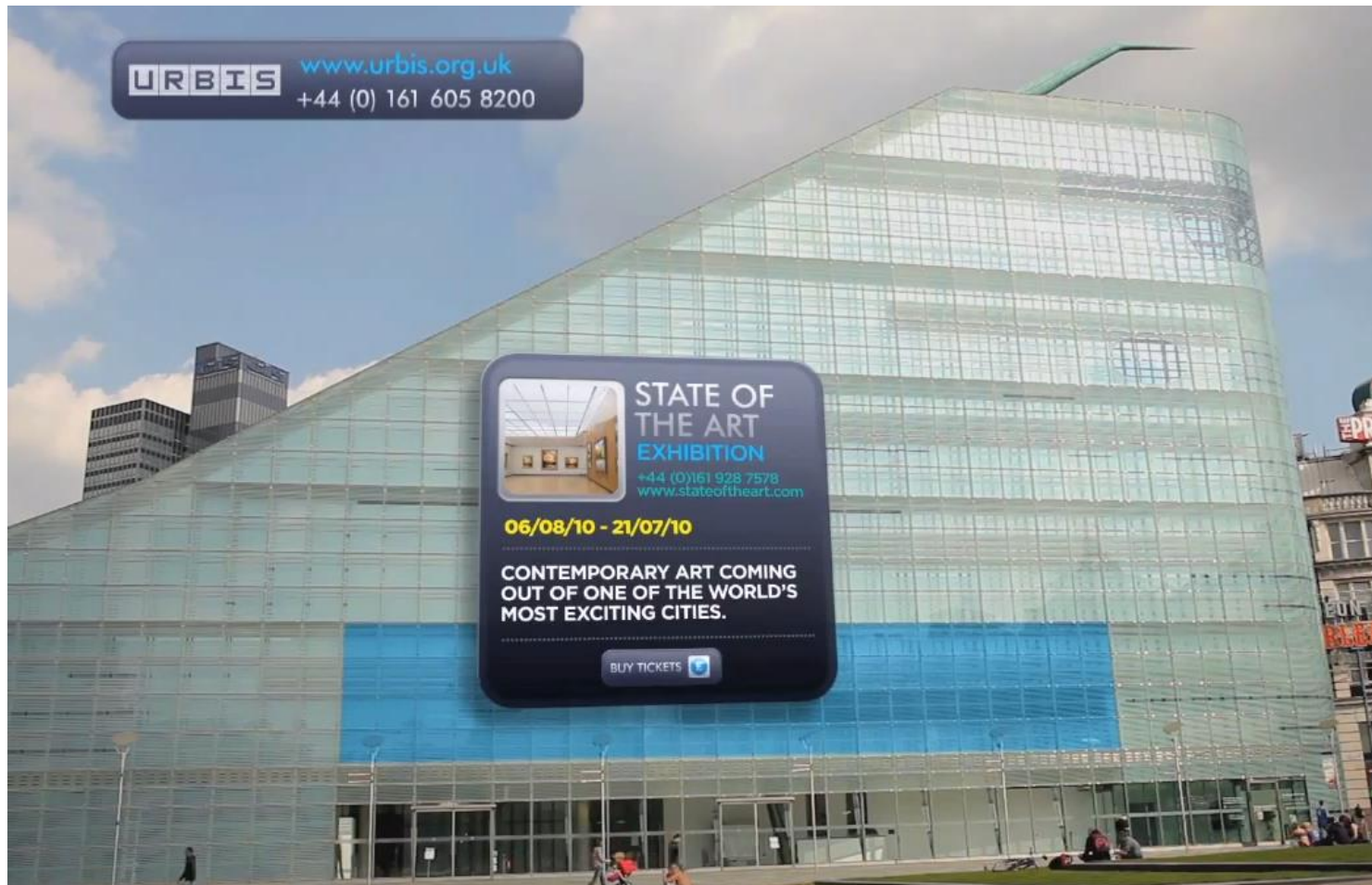
# Lets focus on new communication technologies. The internet of things



# What is the weather going to look be? Just look to the sky through your phone.



# What's going on in that building? Point your phone to it.



Under the belt is the way to go



Walter Staveloz, Colombo 2014.

# A free hug anyone?



# A modern family





# Google



# Closer and closer to the brain



# Always closer to the brain

- Jepsen (Google executive) is not allowed to tell what the most advanced research of the company is she's working on, especially in the field of consumer electronics. She compared however the Google glass with the T-model from Ford, that created a revolution because of low price due to mass-production. "Its light , comfortable and is cool", she says about the "Glass".
- According to Jepsen the future wearable technology is so attractive that no-one will be able to stop its large dissemination in society. She says that the speed by which one will be able to get information on the mobile devices will be addictive.  
  
"In fact its a way to make you stronger," she says. "I already think for years that a laptop is an extension of my brain. Why would I not like to have it closer to my brain en have it with me all the time?"
- Do you get what she's working on?

# An eye inside your home



# Google builds its nest

- Nest makes impeccably designed hardware powered by clever algorithms and is experienced in machine learning, product design, artificial intelligence and robotics.
- In short, Nest understands what users are doing every day in a way that Google's own search engines and tablets don't reach. It's a truly home-centered device that gives Google a view into how people live in the physical world, and not just how they live online.
- "The two companies may seem different, but at their core, they're both heavily focused on understanding the behavior of individuals," said Anind Dey, associate professor at Carnegie Mellon's Human-Computer Interaction Institute.

# Big brother is here to stay

- That means someday soon all of your devices will communicate with each other. Your self-driving car will share notifications from your smartphone, turn it over to your Google Glass when you park and start walking, and then a smart home can take over when you walk through your front door. Thanks to GPS on your phone and car, your house will know exactly when you are arriving and will turn on your favorite TV show when you walk inside. Your refrigerator will know what food is inside and when it expires, and security systems could send your smartphone a notification when they detect anything unusual.
- Streams of data from all these devices will be collected in one place, where Google will analyze that information and learn about you over time. It will then program your hardware and software to meet your unique needs.
- If this is the future, it's no mystery why Google would want to get into the business now. The potential business opportunity is massive.

# Meet with Dot



# Smart phones to test for HIV



Getting people around the world to test themselves for HIV could help bring the HIV/AIDS epidemic under control, by finding infected patients earlier before they infect others, a new study suggests. The study, led by the Research Institute of the McGill University Health Centre, looked at how willing people are to use home-based HIV self-tests over going to a clinic for a test – or not getting tested at all.





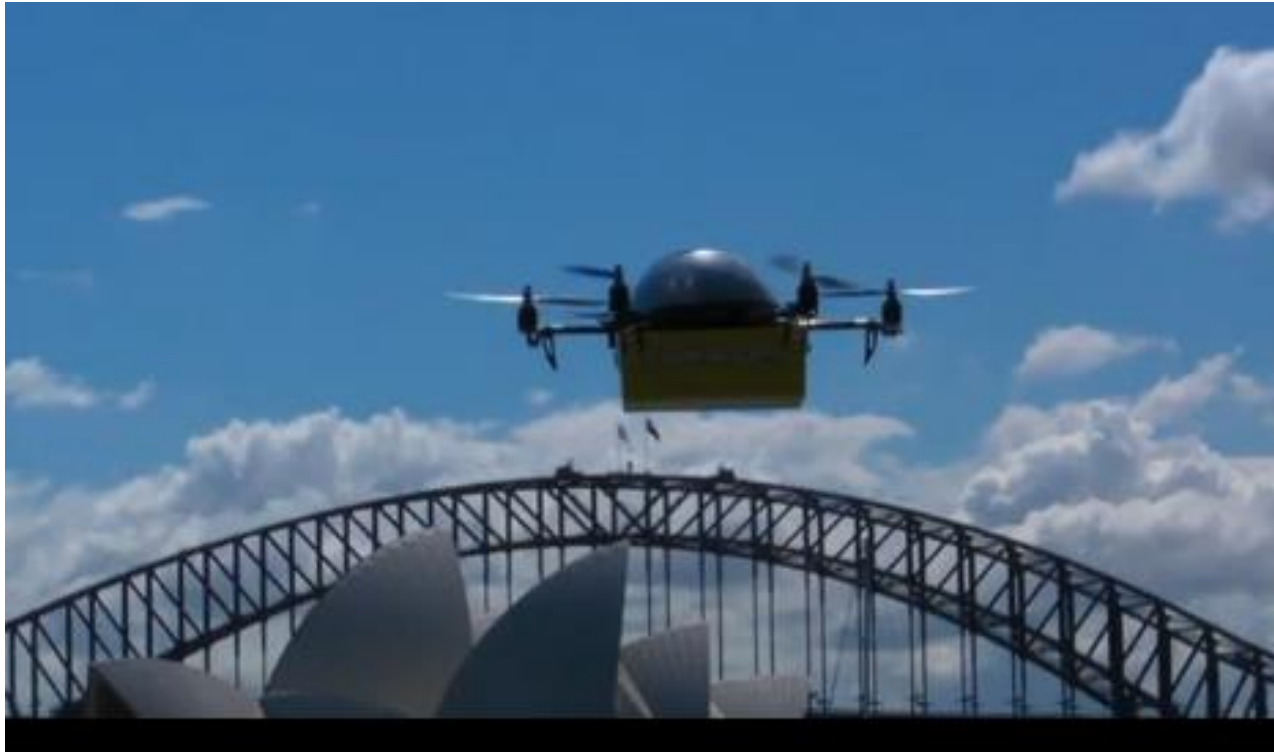
# Low weight microscope that uses the camera of a smart phone



Eva Schmid, Berkeley.

For teaching purposes it has two advantages. Firstly, it is mobile, which means that you can go hiking with your class and discover the world that lives beyond your eyesight. Secondly, because the image of the specimen is seen through the camera function on your phone or iPod, several students can look at an image at the same time, which, as anyone who teaches knows, is a major plus. To do this with standard microscopes would cost a lot of money in specialized cameras and monitors. Being able to do this at a relative low cost can provide students with a way of engaging with science that may be completely different from what they were offered before.

# Study books delivered by drone



# How does that affect our institutions?

- Modern museum-goers won't accept being viewed as passive receptacles of knowledge deemed important by curators and museum educators. Accustomed to Google and Twitter, they embrace democratized knowledge and are ready to “find, interpret, and make their own connections with collections and ideas.”

(Slate Magazine, October 2012)

What is the way forward?

# **THE CHANGE IN THE SCIENTIFIC COMMUNITY**

# A responsibility to improve society

- International law and human rights theory are both unequivocal in including cultural rights as an essential component of human rights. Museums as a consequence have a duty to reduce inequality and offer opportunities for effective participation, giving priority to the areas of greatest need... We now need to embrace our role as centers for cultural democracy. (D. Anderson (2001.1 in George E. Hein: Progressive Museum Practice; John Dewey and Democracy. August 2012)).
- What could be more worthwhile than consistently considering how our educational activities might support democracy and social justice? The important point is not only be that there is an unequivocally educational purpose for all museum activity, but also that education should be progressive, that the educational purpose be in the service of improving society. (George E. Hein: Progressive Museum Practice; John Dewey and Democracy. August 2012)).

# Advocacy in Science

- "scientists are increasingly being encouraged by people inside and outside science to become engaged with the public policy process,...,A subset of scientists is already doing advocacy,..., Some younger scientists,.., are expressing increasing interest in how their work will affect the larger society (...). . (Advocacy in Science. Workshop convened by the American Association for the Advancement of Science, AAAS. Washington, DC. October 17-18, 2011).
- But rather than condemning this trend, the workshop recommends to create materials to help scientists with this new task.

# VOICES: Citizens need to have a say

- Citizens' participation in science and technology policy is the subject of a vast field of research and practice in the domains of science communication and science and technology studies. The European Commission wants to include citizens' preferences, values, needs and expectations in the actual research priorities that will be part of the next framework program "Horizon 2020".
- Prof. Ann Glover, scientific advisor of Manuel Barroso says that evidence based decision making is her big challenge and objective.

# **WHAT KIND OF INSTITUTIONS SHOULD WE BECOME?**



# What PISA doesn't tell you

- Creativity and motivation for science is not only measured by test scores.
- Soft skills that corporations are looking for in their workforce to build the knowledge economy relate to certain types of learning.
- (Visit at Yahoo). Learning programming is great and we need the best, but above all we need people that can solve problems,.....
- Our hypothesis is, that science centers are well equipped to teach these tools.
- Therefore we rather think of preparing the workforce of tomorrow rather than catching up with every single app coming on the market.

# Discover–Discuss-Decide



# Jean Marc Lévy-Leblond, argument 1

- Today's common identification between (scientific) research and (industrial) innovation is both questionable and dangerous. Questionable because there will be only technical applications of limited and unpredictable scientific advances. Dangerous, because it favors the least innovative research, only providing opportunities for short-term results. Material resources are focused on areas with immediate potential applications and stagnate or regress, in the areas of apparently less promising speculative research.
- LE MONDE SCIENCE ET TECHNO | 11.10.2012

# Jean Marc Lévy-Leblond, argument 2

- The basic scientific activity includes two key dimensions: the production of knowledge (research) and knowledge transfer (education, popularization). Unilaterally emphasizing the first is counter-productive, (...)The dissemination of knowledge is a condition of development
- LE MONDE SCIENCE ET TECHNO | 11.10.2012

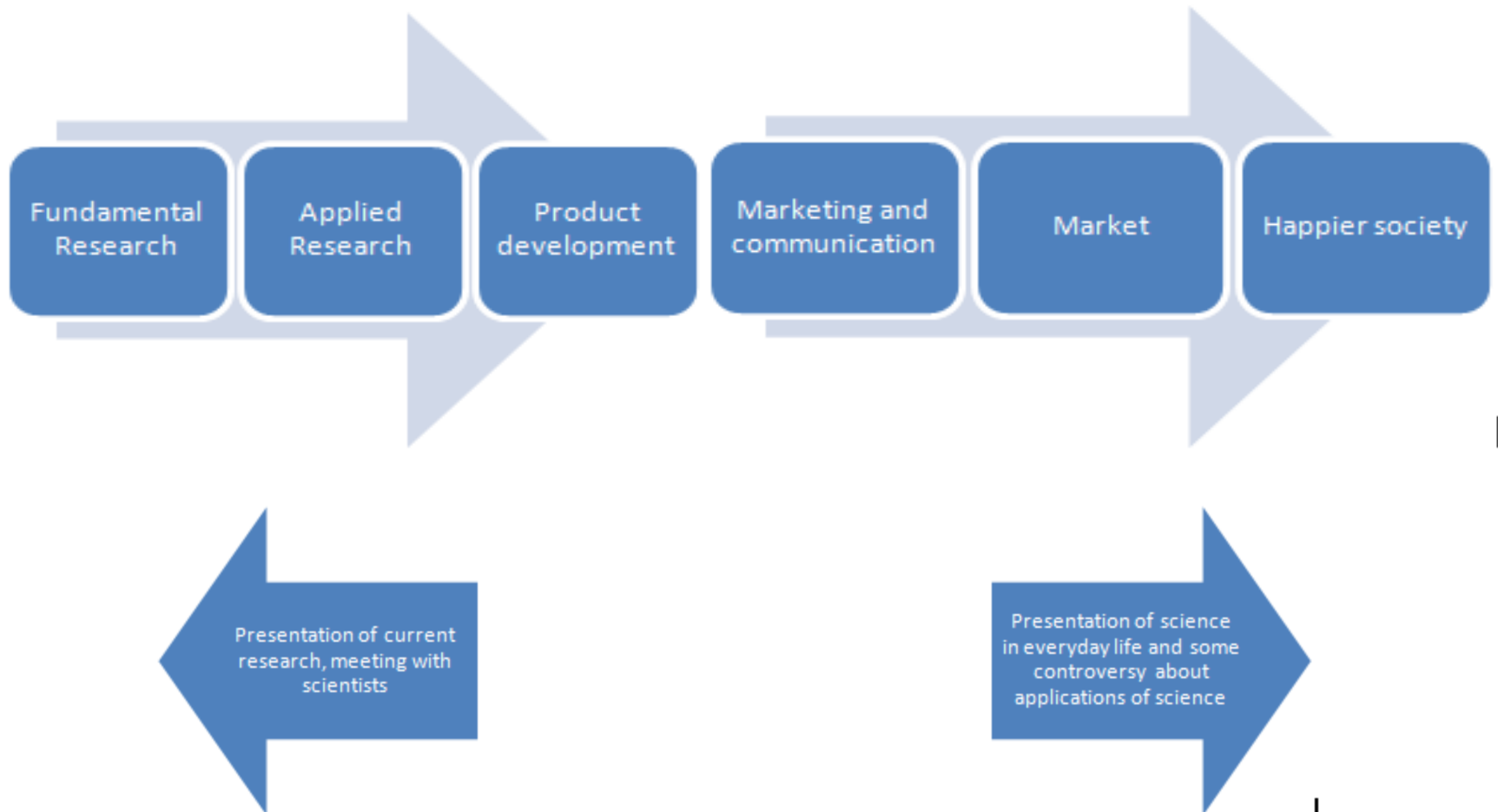
# Jean Marc Lévy-Leblond, argument 3

- The mission of science professionals is no longer solely limited to the production of new knowledge and the transfer of new (acquired) knowledge. The social and economic impact of scientific discoveries (cloning, GMOs, nanotechnologies, etc..) Gives researchers a collective responsibility to contribute to the necessary public debate on issues and priorities for science policy.
- LE MONDE SCIENCE ET TECHNO | 11.10.2012

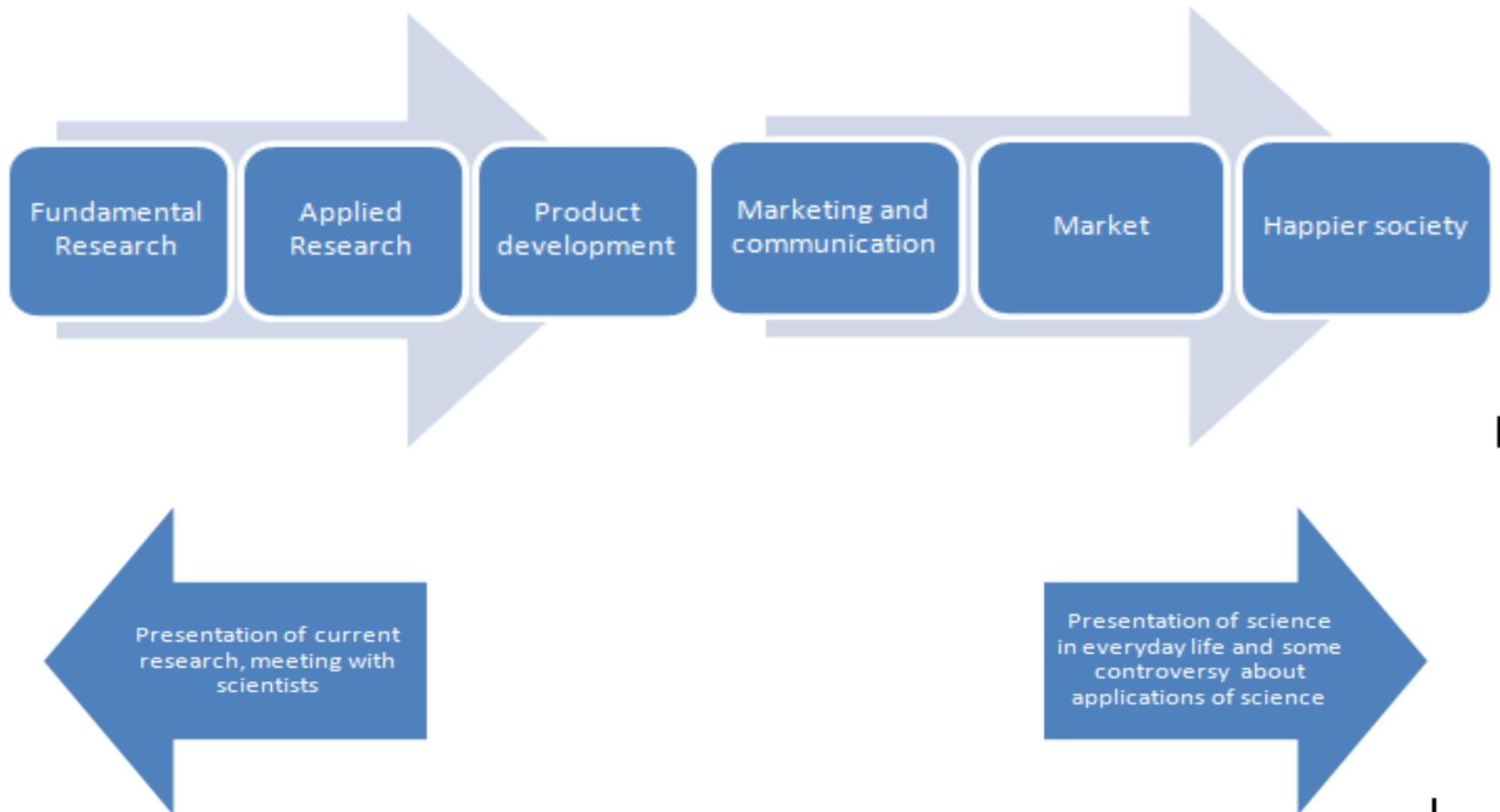
# Jean Marc Lévy-Leblond, argument 4

- The democratic principle doesn't work in the techno-science field anymore. The public debate is still embryonic and elected officials are unengaged in this domain. A large movement of both dissemination and discussion of the prospects for the development of science is necessary for deepening the democracy which is crucial for the future.
- LE MONDE SCIENCE ET TECHNO | 11.10.2012

# Today's model

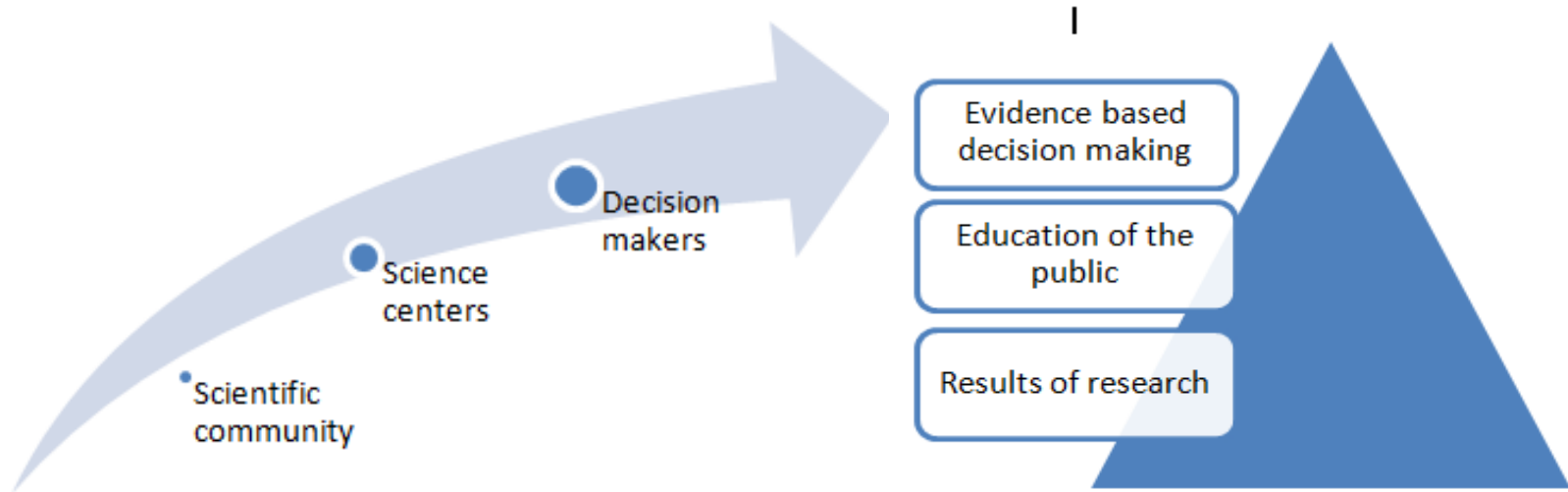


# We need to improve the science and society relationship on both ends





# Science in Society model



# What does the right to science mean?

**Farida Shaheed:** The UN Special Rapporteur in the field of cultural rights

What more than the right to food and health are we talking about when we talk about the right to science?

Access to science must include participation in the whole scientific process — it's not just the end product.

You have the scientific process, then the knowledge that's created, then the applications. All of those things make up the right to science.

# New vision

- Don't show the technology innovation for itself
  - Back to basics:
    - Show the science
    - Create the new generation of inventors
- Become an active player in your community.
- Prepare your audiences to become part of the evidence base decision making process.