technology transfer by any means necessary…

Patrick Courtney

ECHORD workshop

RSS Berlin 28th June 2013

patrick.courtney@acm.org

technology transfer by any means…

- ECHORD experiments as technology transfer
- Mechanisms of:
  - Patents
  - Standards
  - Open source
- Some conclusions

Traditional model

research → application
academia → companies
publications → product

Traditional model

research → application
academia → companies
publications → product

- Perceptions of
  - Patents as a cost
  - Standards as a burden
  - Open Source as a threat

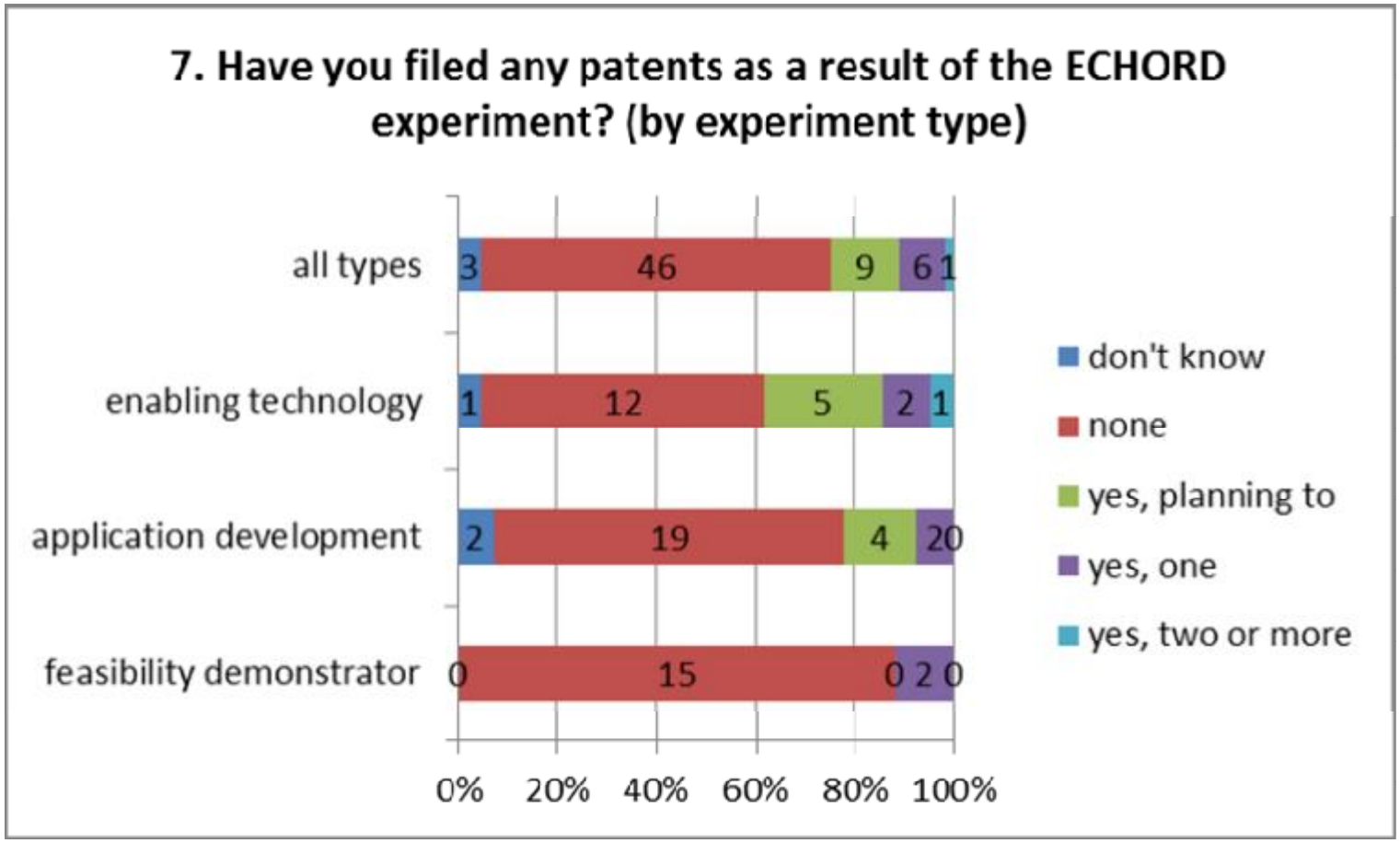
ECHORD experiments

- 51 experiments

European Clearing House
for Open Robotics Development
www.echord.info

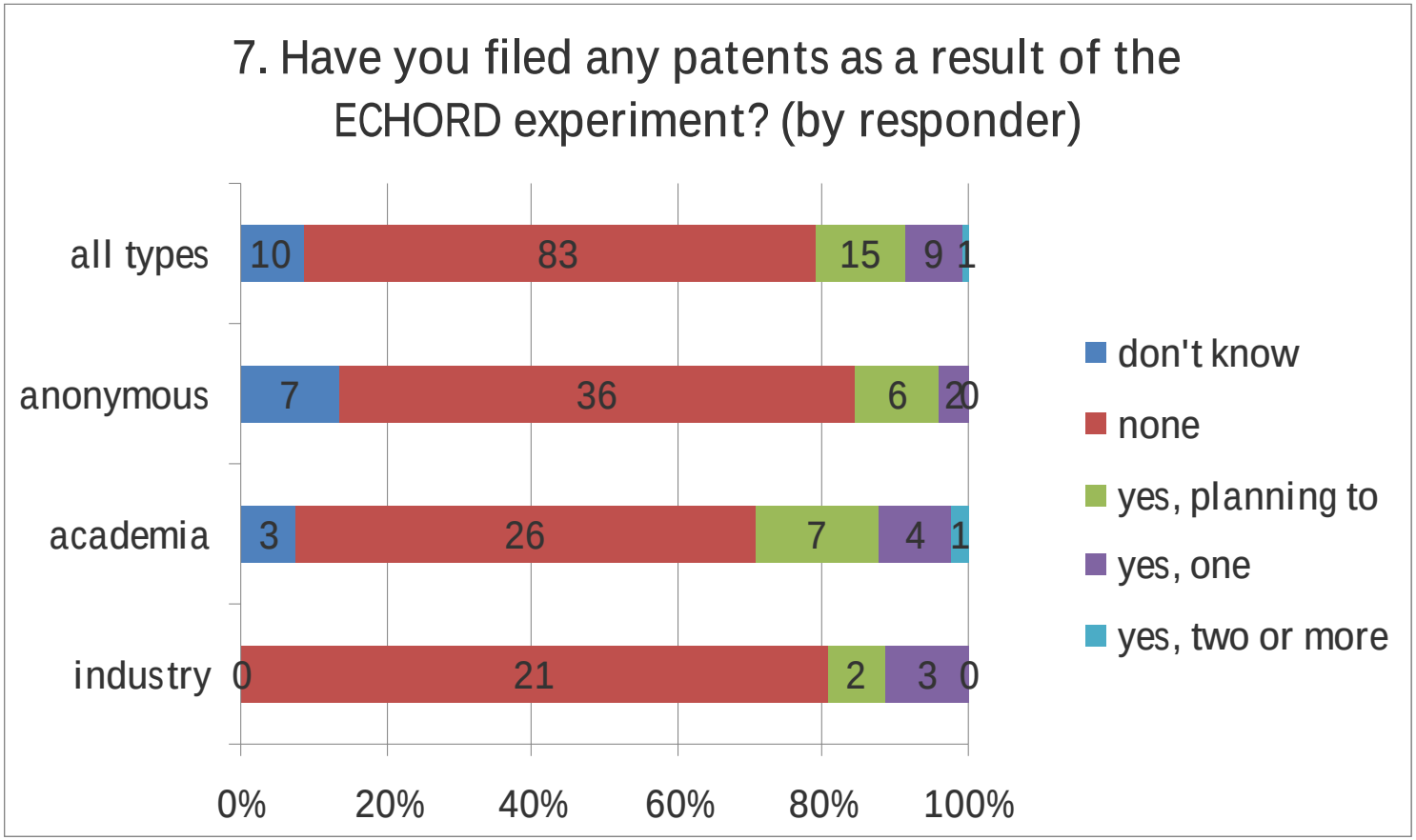
- Impact study carried out summer 2012
  - measured inputs and outputs

Enabling technology experiments produce patents



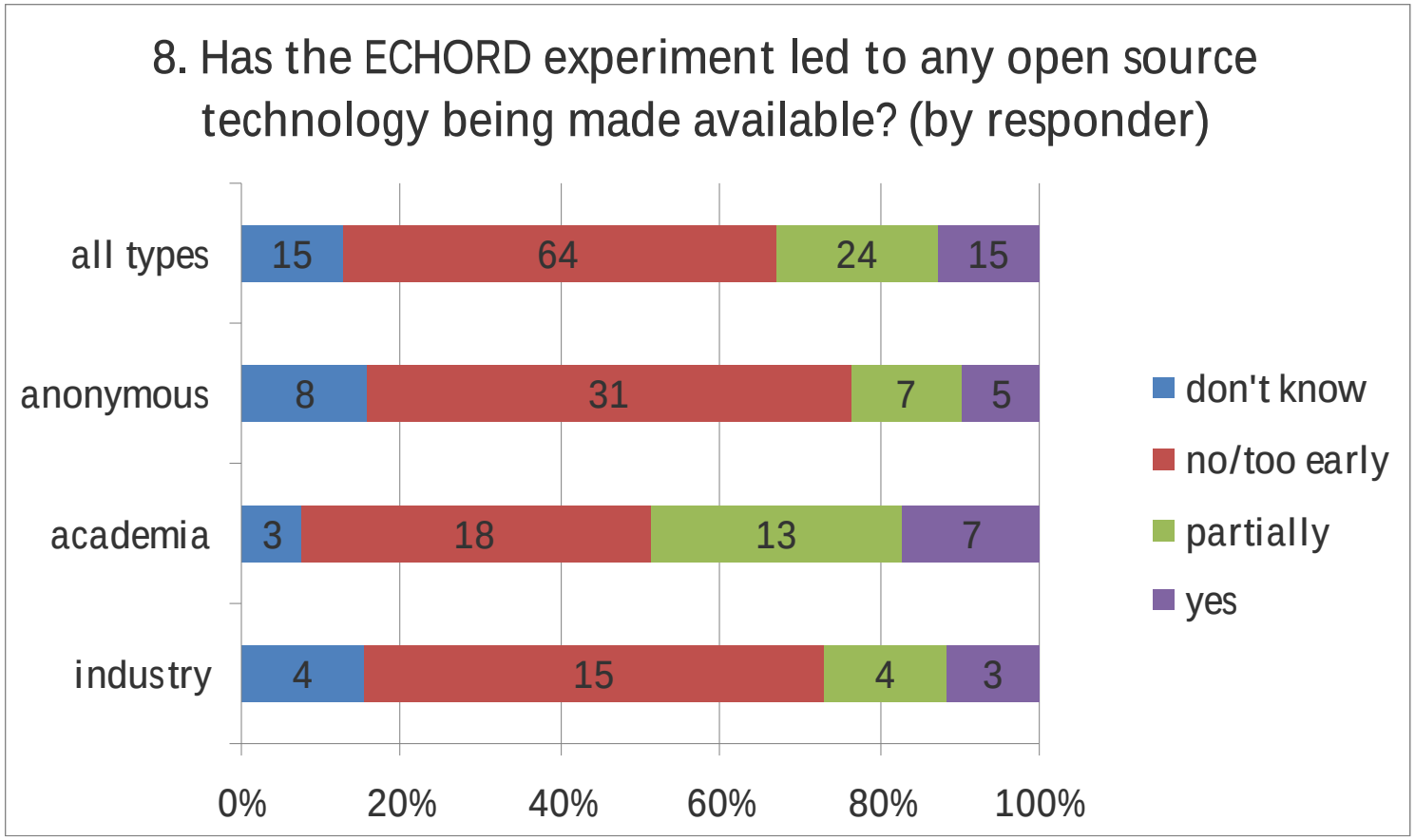
40% of enabling technology experiments

Some academics file patents



20% of industry and 30% of academics

Contribute to open source



30% of industry and 50% of academics

Motivations to patent

protection from imitation

Motivations to patent

offensive block competition

defensive block competition

secure geographic markets

protection from imitation

Motivations to patent

offensive block competition

defensive block competition

secure geographic markets

protection from imitation

improve technology image
product marketing

influence standards

Motivations to patent

offensive block competition

defensive block competition

secure geographic markets

protection from imitation

licence revenue

negotiation cooperation

assets to cross licence

improve technology image
product marketing

influence standards

Motivations to patent

offensive block competition

defensive block competition

secure geographic markets

increase company value

access to finance

protection from imitation

licence revenue

negotiation cooperation

assets to cross licence

improve technology image product marketing

influence standards

Motivations to patent

offensive block competition

defensive block competition

secure geographic markets

increase company value

access to finance

protection from imitation

licence revenue

negotiation cooperation

assets to cross licence

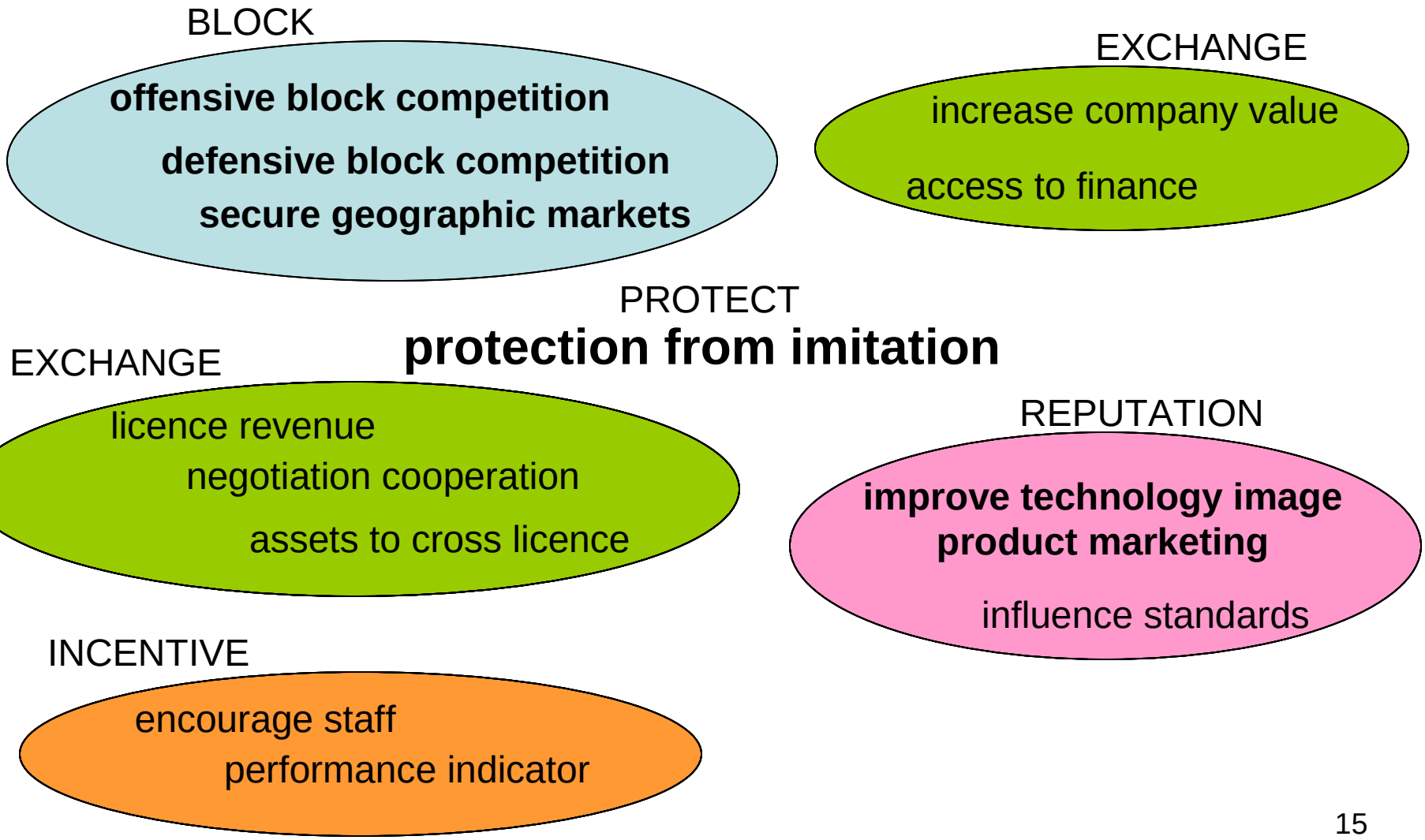
improve technology image product marketing

influence standards

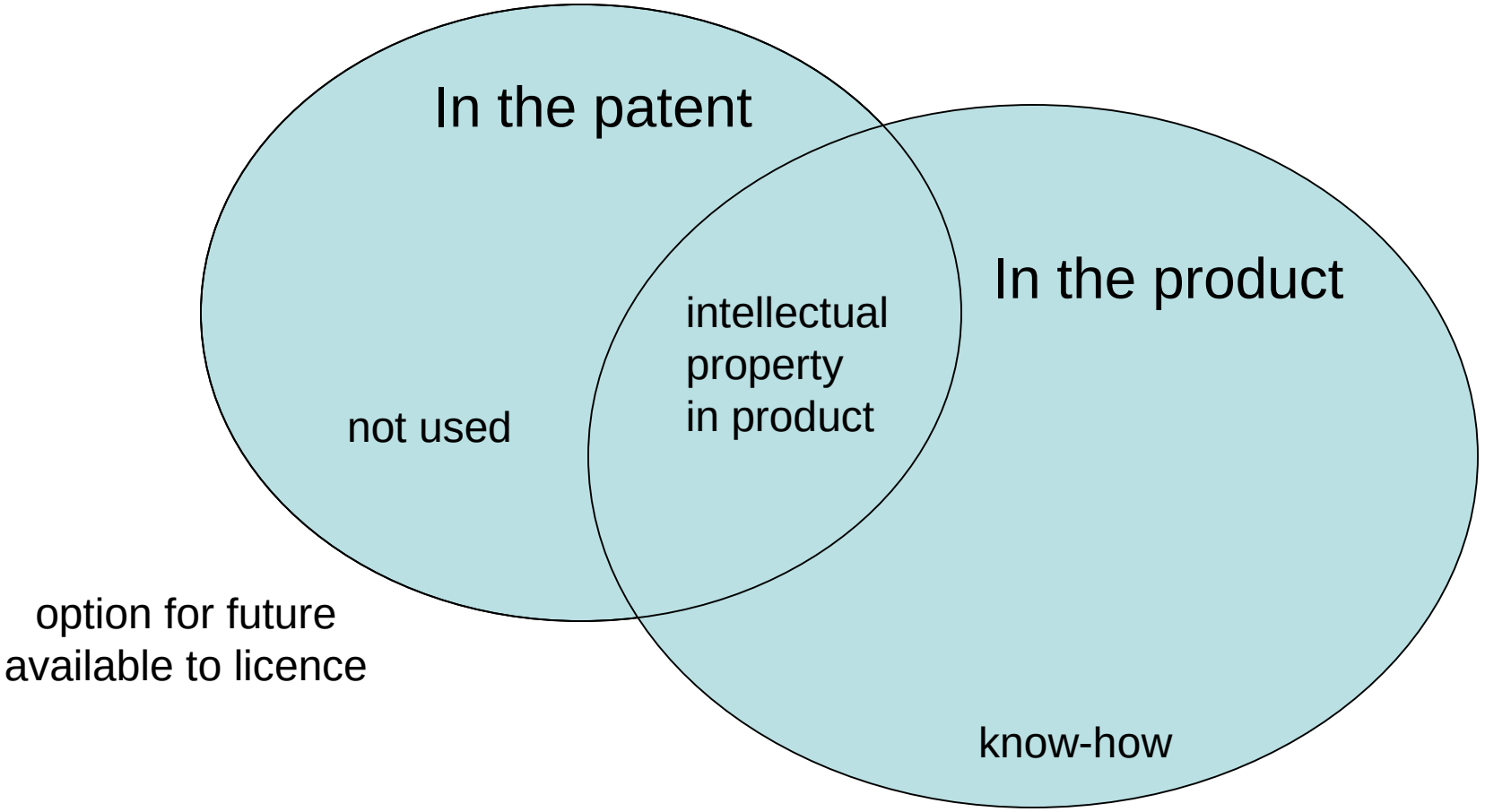
encourage staff

performance indicator

Motivations to patent



A patent is a product too



Which model ?

Orchard

Fortress

Why standards?

- Types and roles of standard
  - Swann's 4 types
  - Hatto's 4 places

- Standards as stifling of innovation
  - "[it is] dangerous to standardize too soon [in] developing areas"
  - "[in] more for mature areas, [there are] rival standards"

The shipping container as interface standard

- 30 times cheaper per ton than bulk shipping

Source:, wikipedia

Types of standards (1 of 4)

- Interface standards
  - eg screw thread
  - eg media: VHS/betamax, Blu-ray/HD

- Economic effects
  - Switching costs (learning, exchange)
  - Reduces risks perceived by producers & customers

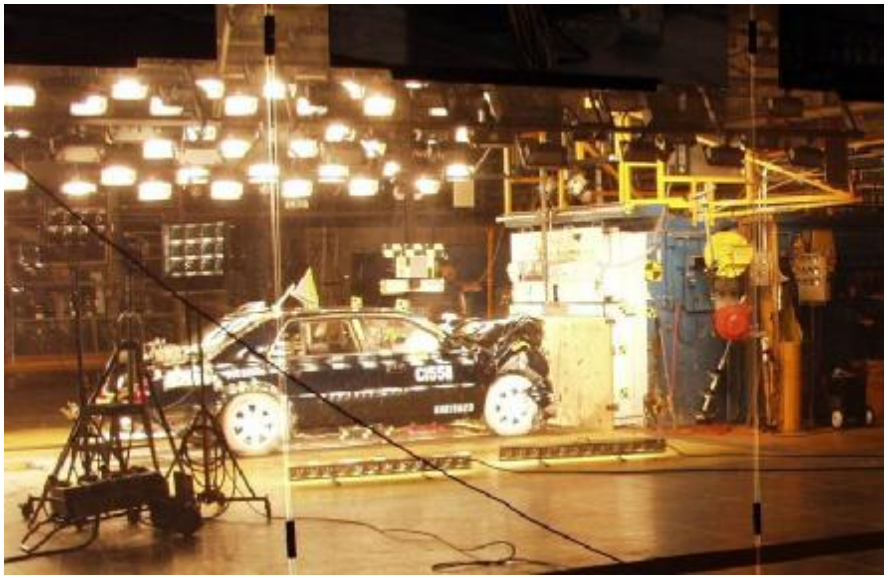
- Network effects: Metcalfe's law
  - Direct: eg mobile phones
  - Indirect: eg car parts
  - May be positive or nil

- Applicable to robotics

Source: Swann, wikipedia

Types of standards (2 of 4)

- Minimum quality
  - Fitness for purpose, safety
  - legal
  - usability
  - basic functionality
  - etc



- Economic effects
  - Reduces risks that are hidden/hard to assess
  - Helps to protect a market against Gresham's Law
    - “bad drives out good”
  - Reduces transactions costs between different producers, as well as between producers & customers

- Applicable to robotics (ISO 10 218)

Source: Swann, wikipedia

Types of standards (3 of 4)

- Variety reduction
  - eg shoe sizes
  - very applicable to software

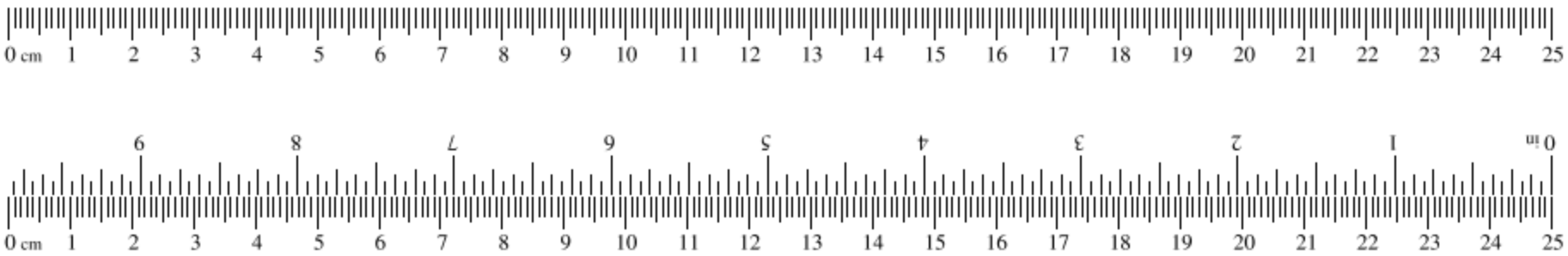
- Economic effects
  - Avoids wasteful proliferation
  - Provides economies of scale
  - Helps to build cohesion & critical mass in the formative stages of a market
  - Can focus technology trajectories

- Applicable to robotics

Source: Swann, wikipedia

Types of standards (4 of 4)

- Information/measurement on product description
  - eg mm vs inch (japan?)

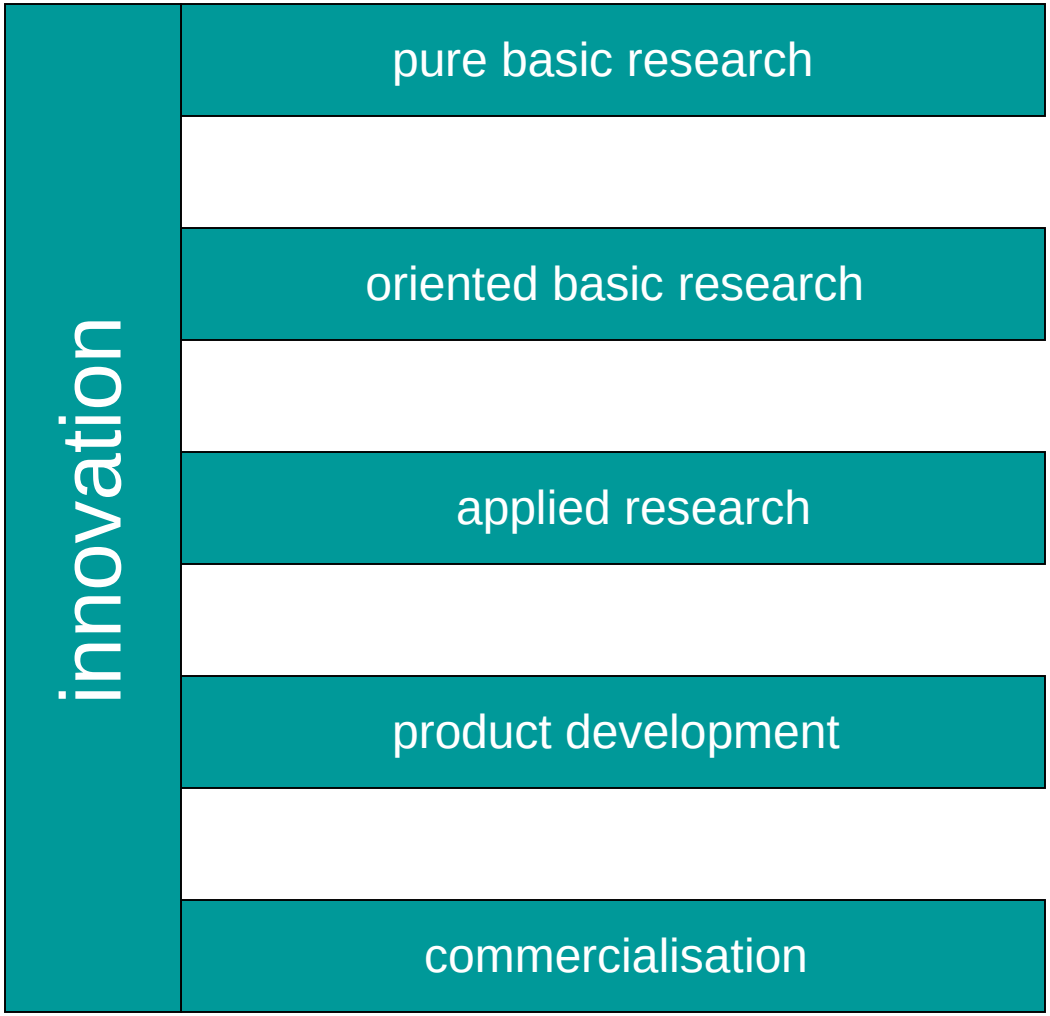


- Economic effects
  - allows innovative producers to demonstrate to the satisfaction of the customer, that products are as innovative as they claim to be

- Applicable to robotics (benchmarking initiatives eg GEM)

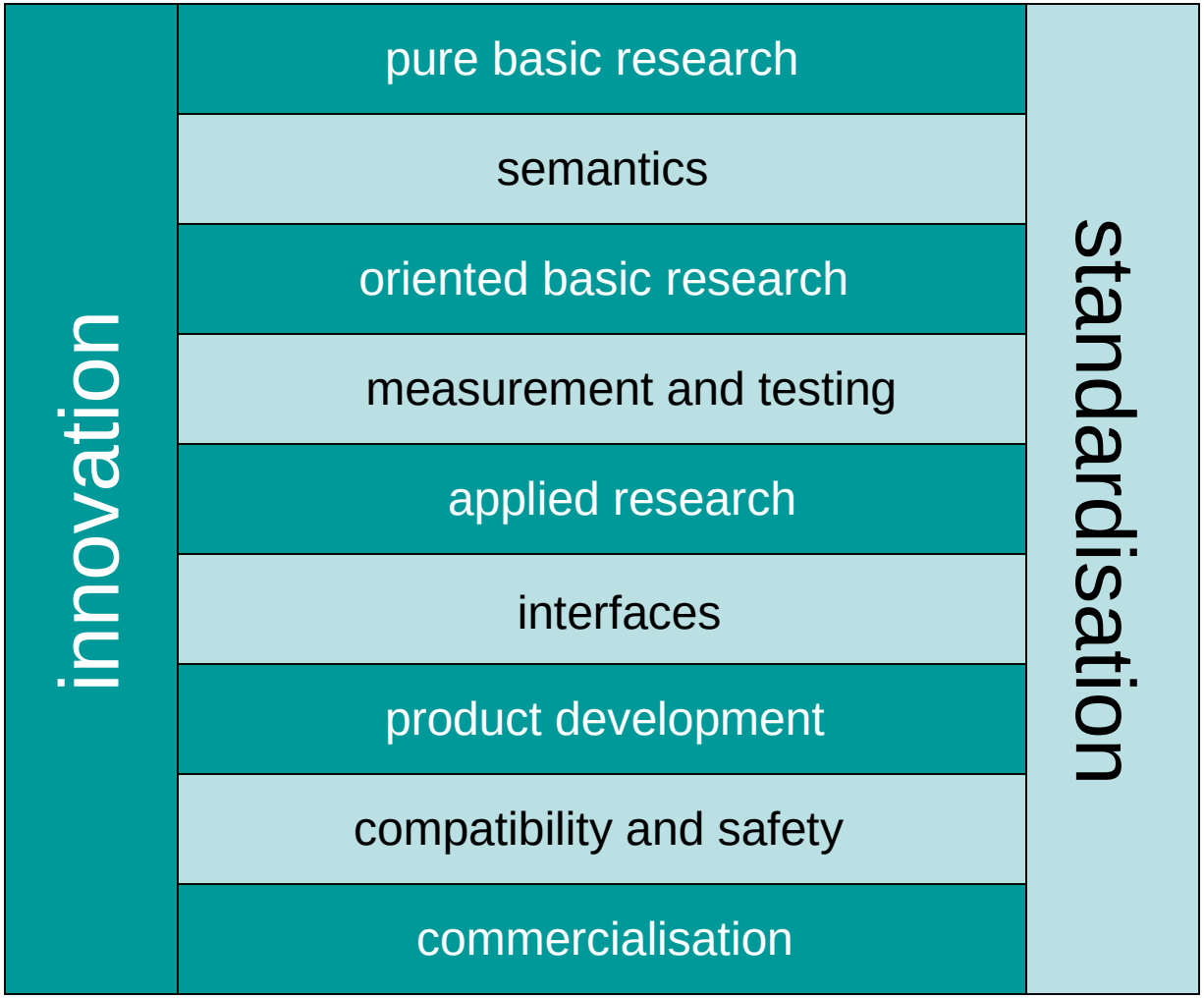
Source: Swann, wikipedia

Where do standards contribute?



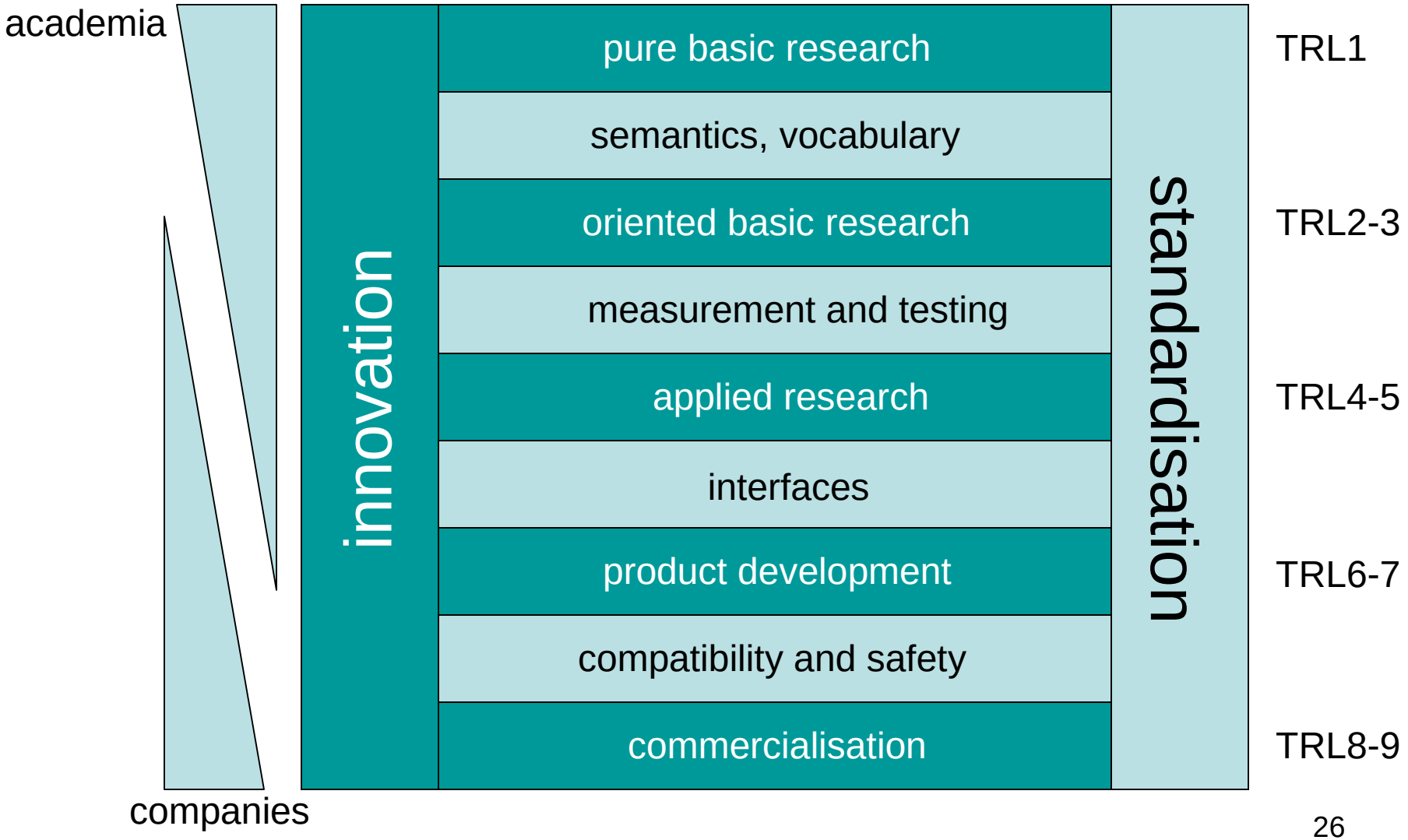
Source:, Hatto

Where do standards contribute?



Source:, Hatto

Where do standards contribute?



Source:, Hatto

Role of industry structure

- If market is concentrated
  - de facto standard; closed or open standard
- If market is fragmented
  - Innovative: avoid waste of limited resources
  - Not innovative: doesn’t matter
- So is this relevant to robotics?

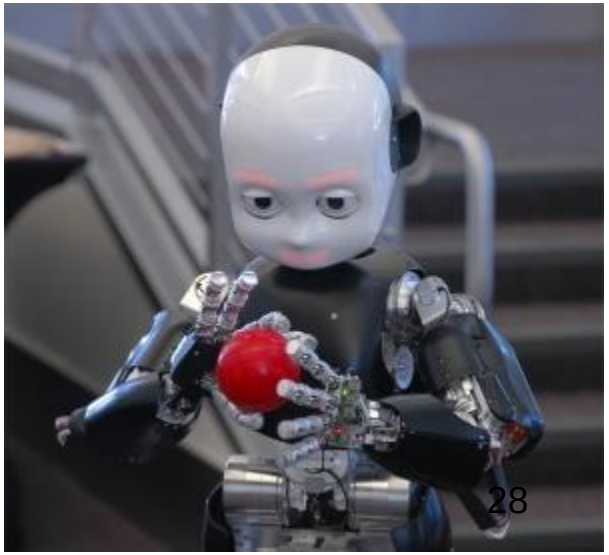
Open Source

ROS

Open Source Robotics Foundation

OpenCV

iCub



Conclusions

- See patents as an opportunity not a cost
  - But need to manage actively
- Standards can be drafted & diffused early
- Use and contribute to open source
- Further networking and co-operation

References

- Peter Hatto (2013), Standards and Standardisation A practical guide for researchers, European Union, ISBN 978-92-79-25971-5 doi: 10.2777/10323

- G.M. Peter Swann (2010), The Economics of Standardization: An Update, Report for the UK Department of Business, Innovation and Skills (BIS)

- Blind, K.; Edler, J.; Frietsch, R.; Schmoch, U. (2006), Motives to patent: empirical evidence from Germany. In: Research Policy, 35, pp. 655-672

- Blind K., Jungmittag, A., Mangelsdorf, A, (2010): Economic benefits of standardization, Beuth Publishers, ISBN: 3-410-15066.