!CHAOS: A Cloud of Controls

General Meeting

INFN-LNF, 12 Nov 2014

management, communication

(objective and trend)

Management - update

- chiusi ma in attesa di approvazione giunta borse: Marco Zagaroli (WP3) e Salvatore Caschera (WP2)
- chiusi e in forze gli assegni di ricerca: Francesca Spagnoli (WP1) e Michele Tota (WP5)
- approvato contribut(ino) !CHAOS @ CSN5
- agreement NI e ADF…

logistics

- - 16/12/2014 PCM
- - 13/01/2015 PCM
- - 10/02/2015 General meeting
- - 10/03/2015 PCM
- - 07/04/2015 PCM
- - 05/05/2015 General meeting
- - 09/06/2015 PCM

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Management - budget report

!CHAOS MIUR (2015)

Capitolo	Descrizione	Assegnati	Impegni	Disponib.	Disp. Teorica
U102_121405	MISSIONI NON SOGGETTE A	23.000,00	2.946,40	20.053,60	20.053,60
U103_130120	MATERIALE DI CONSUMO	11.726,72	6.087,80	5.638,92	5.638,92
U212_520110	IMPIANTI ATTREZZATURE	23.000,00	15.313,55	7.686,45	7.686,45
Totale:		**58.000,00**	**24.621,03**	**33.378,97**	**33.378,97**

Dotazioni CSN5 (2015)

Capitolo	Descrizione	Ciesti	Impegni	Disponib.	Disp. Teorica
U102_121405	MISSIONI NON SOGGETTE A	5.000	0	2.000	2.000
U103_130120	MATERIALE DI CONSUMO	0	0	0	0
U212_520110	IMPIANTI ATTREZZATURE	15.000	0	7.000	7.000
Totale:		**20.000**	**0**	**9.000**	**9.000**

bando premiali 2012

ideazione e presentazione progetto

prima comunicazione

revisione assegnazioni parlamento

disponibilita' fondi nell'INFN - richiesta contratti

bando assegni bando borse

riunione commissione assegni

riunione commissione borse convocazione assegni

convocazione borse

Spring

end

2012 2013 2014 gen feb mar apr may jun jul aug sep oct nov dic 2015

KICKOFF MEETING

KICKOFF MEETING

full start of the project

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

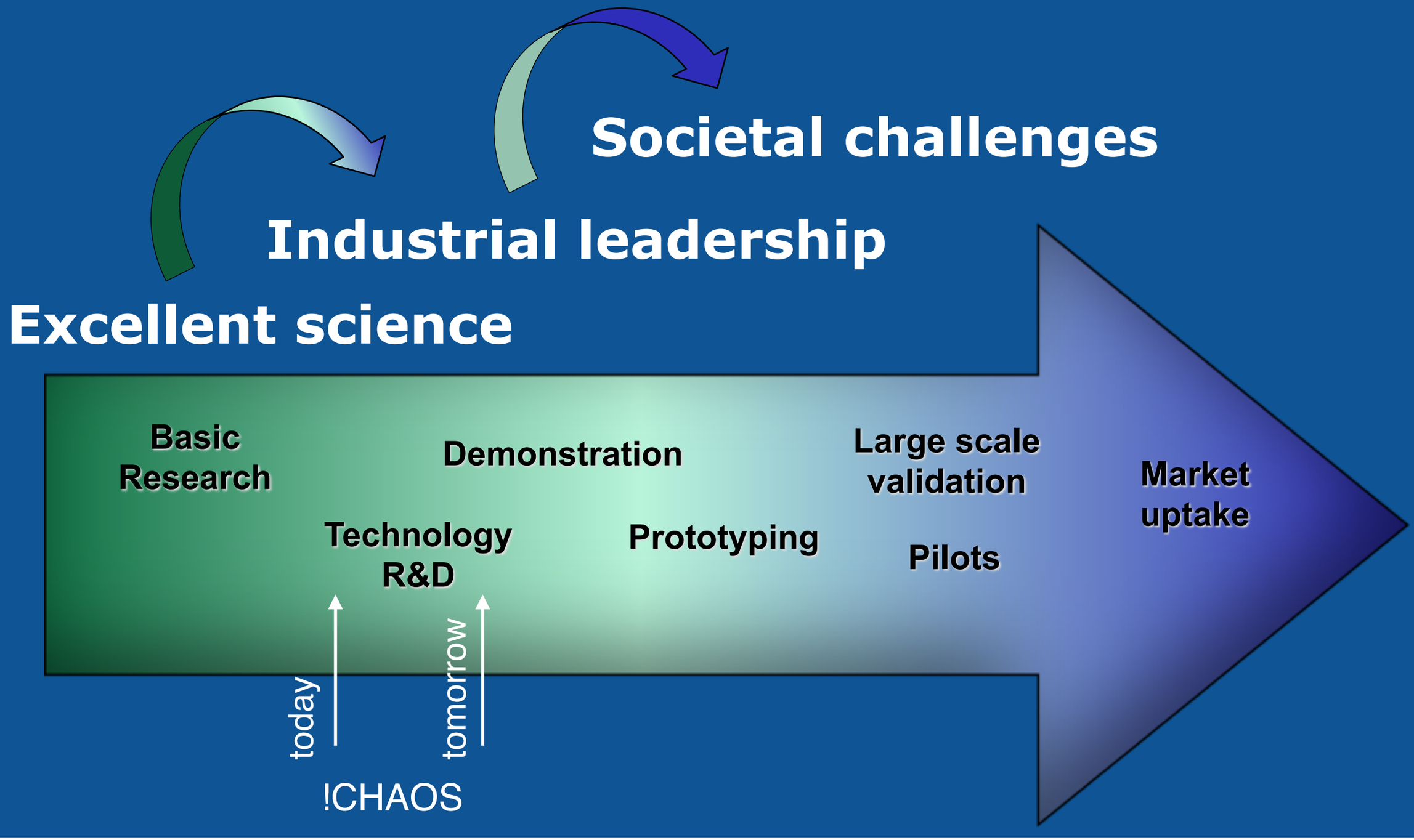
HORIZON 2020

from development to innovation

R&D

R&I

Coverage of the full innovation chain



ICT in Excellent Science

Excellence in the Science Base

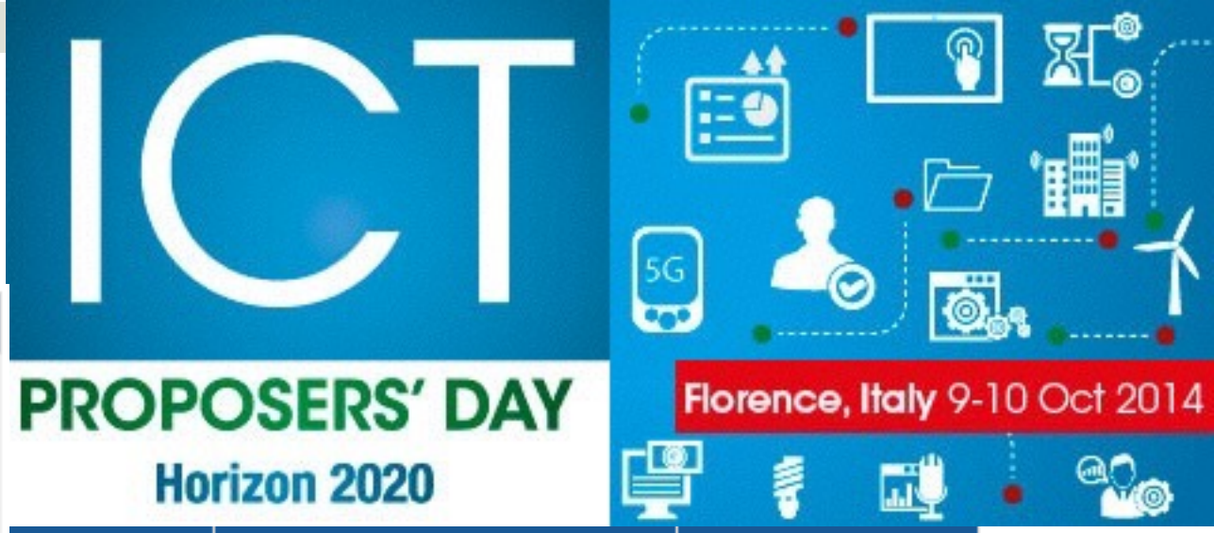
- Frontier research (ERC)
- Future and Emerging Technologies (FET)
- Skills and career development (Marie Curie)
- Research infrastructures

Creating Industrial Leadership and Competitive Frameworks

- Leadership in Enabling and industrial technologies (LEIT)
  - **ICT**
  - Nanotech., Materials, Manuf. and Processing
  - Biotechnology
  - Space
- Access to risk finance
- Innovation in SMEs

Tackling Societal Challenges

- Health, demographic change and wellbeing
- Food security, sustainable agriculture and the bio-based economy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, resource efficiency and raw materials
- Inclusive, innovative and reflective societies
- Secure Societies

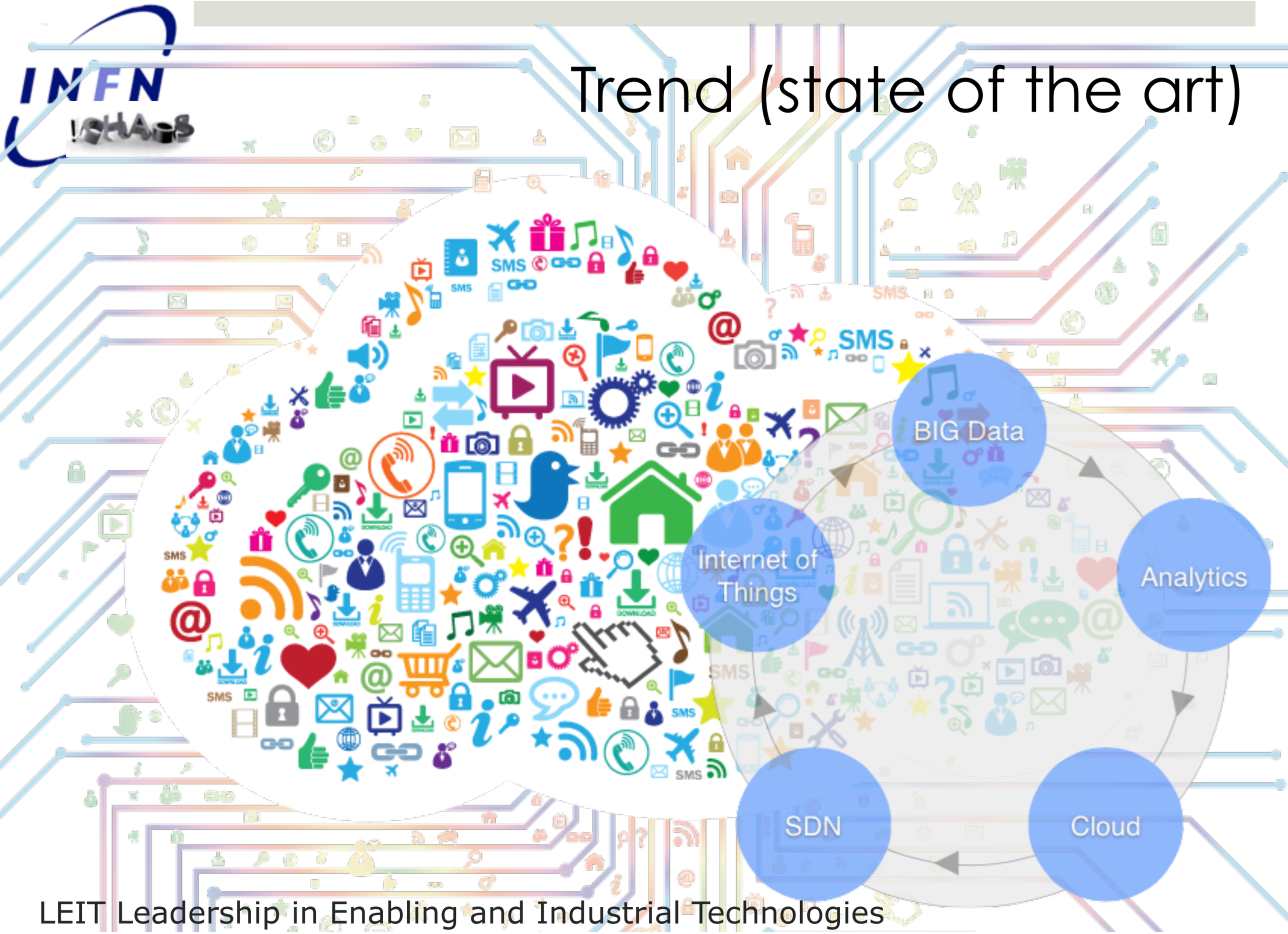


Time	Sessions	Village
10:00 - 11:30	CAPS Collective Awareness Platforms	Net Futures
	Learning & Teaching Technologies	Content
	FoF Factories of the Future	Components & Systems
	HPC High Performance Computing	Excellence & International
	Water Management	Sustainability, Public Services & Security
	H2020: Proposal Making (*)	Health & Well-Being
12:0 13:3	Cloud Computing Procurement Actions	Excellence & International
	Future Micro-Nano Electronics	Components & Systems
	VREs and eInfrastructure skills	Excellence & International
	eHealth Services	Health & Well-Being
	ICT-based solutions for Energy Efficiency	Sustainability, Public Services & Security
	Digital Cultural Assets	Content
14:3 16:0	Big Data	Content
	Photonics PPP	Components & Systems
	FET Open	Excellence & International
	Health Data and Modelling	Health & Well-Being
	ICT-Based solutions for Transport & Green Vehicles	Sustainability, Public Services & Security
14:30 - 17:10	5G PPP and Network Prizes	Net Futures
16:30 - 17:10	eHealth prize	Health & Well-Being
16:30 - 18:00	Technologies for Creative Industries	Content
	Cross-cutting ICT KETs	Components & Systems
	Smart Cities	Sustainability, Public Services & Security
	H2020: Proposal Making (*)	Excellence & International
17:20 - 18:00	Support for Standardisation (*)	Health & Well-Being

Time	Sessions	Village
09:30 - 11:0	FIWARE Accelerator Programme	Net Futures
	Internet of Things and Platforms for Connected Smart Objects	Components & Systems
	FTI Fast Track to Innovation	Content
	Active and Healthy Ageing	Health & Well-Being
	ICT-enabled Open Government - Emerging Technologies	Sustainability, Public Services & Security
	H2020: Proposal Making (*)	Excellence & International
11:30 - 13:00	Customised and Low-power Computing	Components & Systems
	FIRE Future Internet Research & Experimentation	Net Futures
	ODI Open Disruptive Innovation	Content
	International Cooperation	Excellence & International
	ICT for Integrated Care	Health & Well-Being
	ICT-enabled Open Government & Mobile e-Government by SMEs	Sustainability, Public Services & Security
14:00 - 14:40	Support for Access to Finance (*)	Excellence & International
14:00 - 15:30	ICT 24 – 2015: Robotics	Components & Systems
	PCP-Open	Content
	R&D Targeted Cooperation with Brazil	Net Futures
	Digital Security	Sustainability, Public Services & Security
	Put Innovation at the Core of your Proposal (*)	Health & Well-Being
15:30	[illegible] (*)	[illegible] & International

https://ec.europa.eu/digital-agenda/en/ict-proposers-day-9-10-october-2014

Trend (state of the art)



LEIT Leadership in Enabling and Industrial Technologies

Save Money, Save Time, Sleep Easy: Transition to Cloud Computing

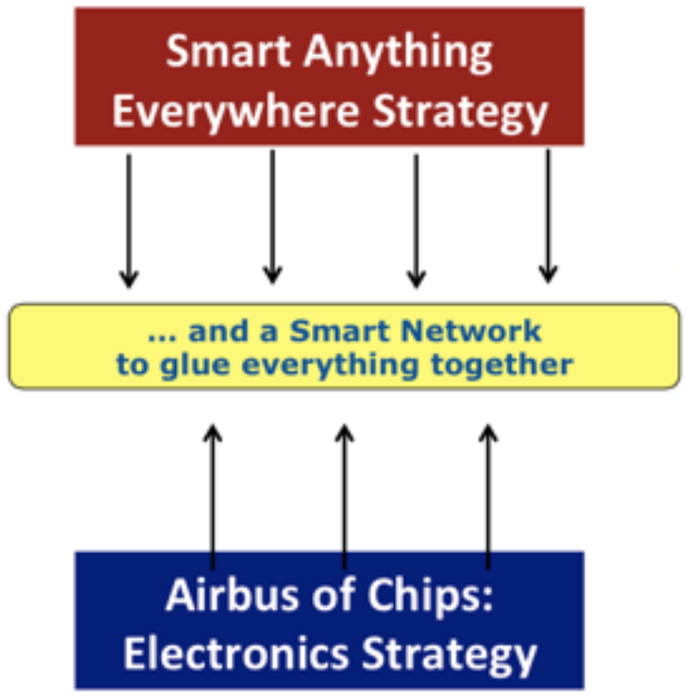
- **cluster2cloud** (form - GRID - **computer resources** from **multiple locations** to reach a common goal **to cloud computing,** computing in which large groups of remote servers are networked to allow the **centralized** and online access to computer **services** or **resources -** reallocated dynamically and on demand)

- Switching to cloud computing will save you time and money
- Virtual servers combined with a SAN allow for improved protection against disasters
- Fully utilize your hardware with better resource management
- The transition from physical to virtual servers leads to better flexibility
- Dedicated hardware means increased security

Internet of Things

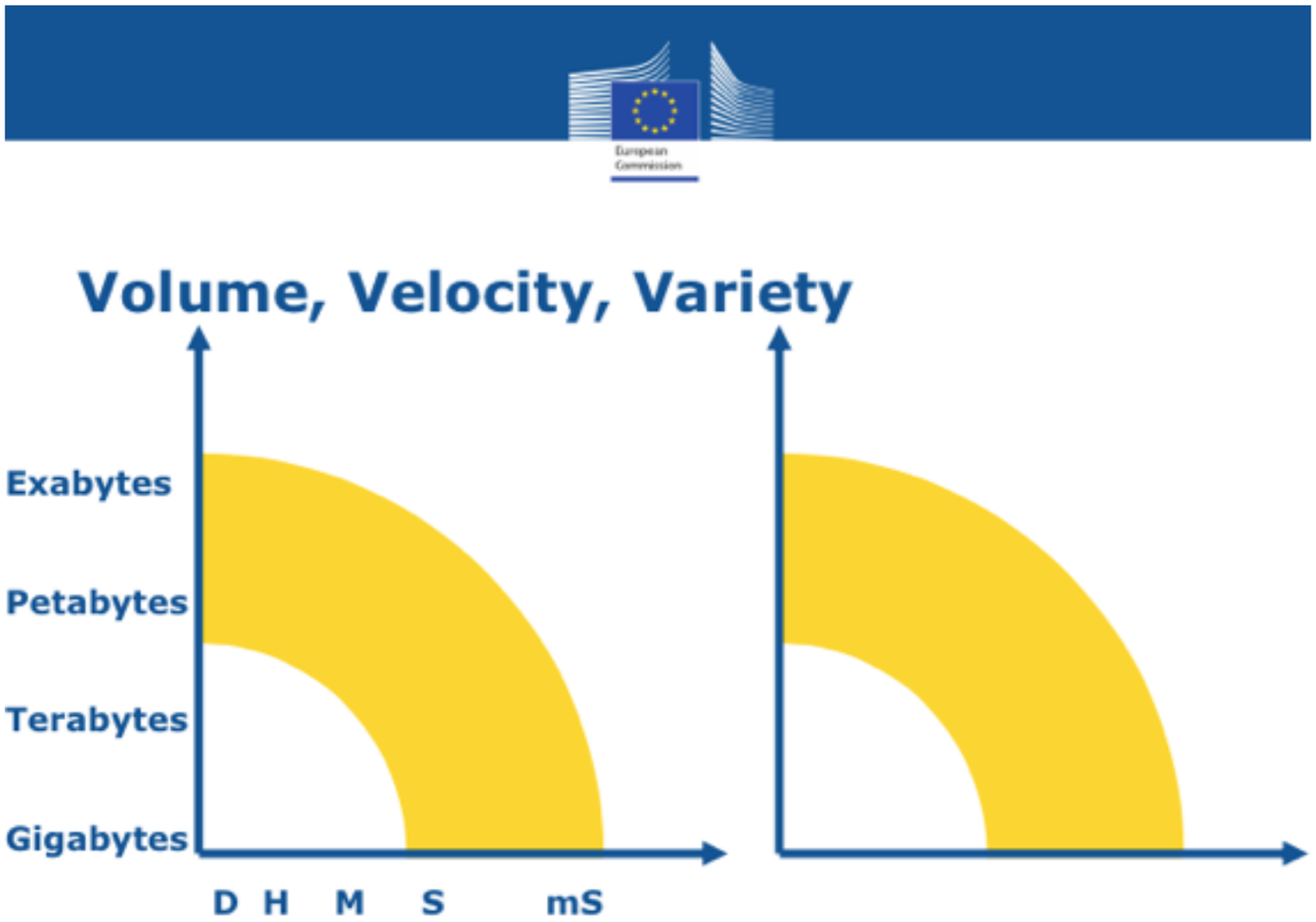
Internet of Things and Platforms for Connected Smart Objects cuts across several LEIT-ICT technological areas (smart systems integration, cyber-physical systems, smart networks, big data) and brings together different generic ICT technologies and their stakeholder constituencies to develop technological platforms which will have a strong influence on the way in which we live and work.

A double sided ("macaron") strategy



Big Data

EU support the Big Data challenge by addressing fundamental research problems related to the scalability and responsiveness of analytics capabilities (such as privacy-aware machine learning, language understanding, data mining and visualization)



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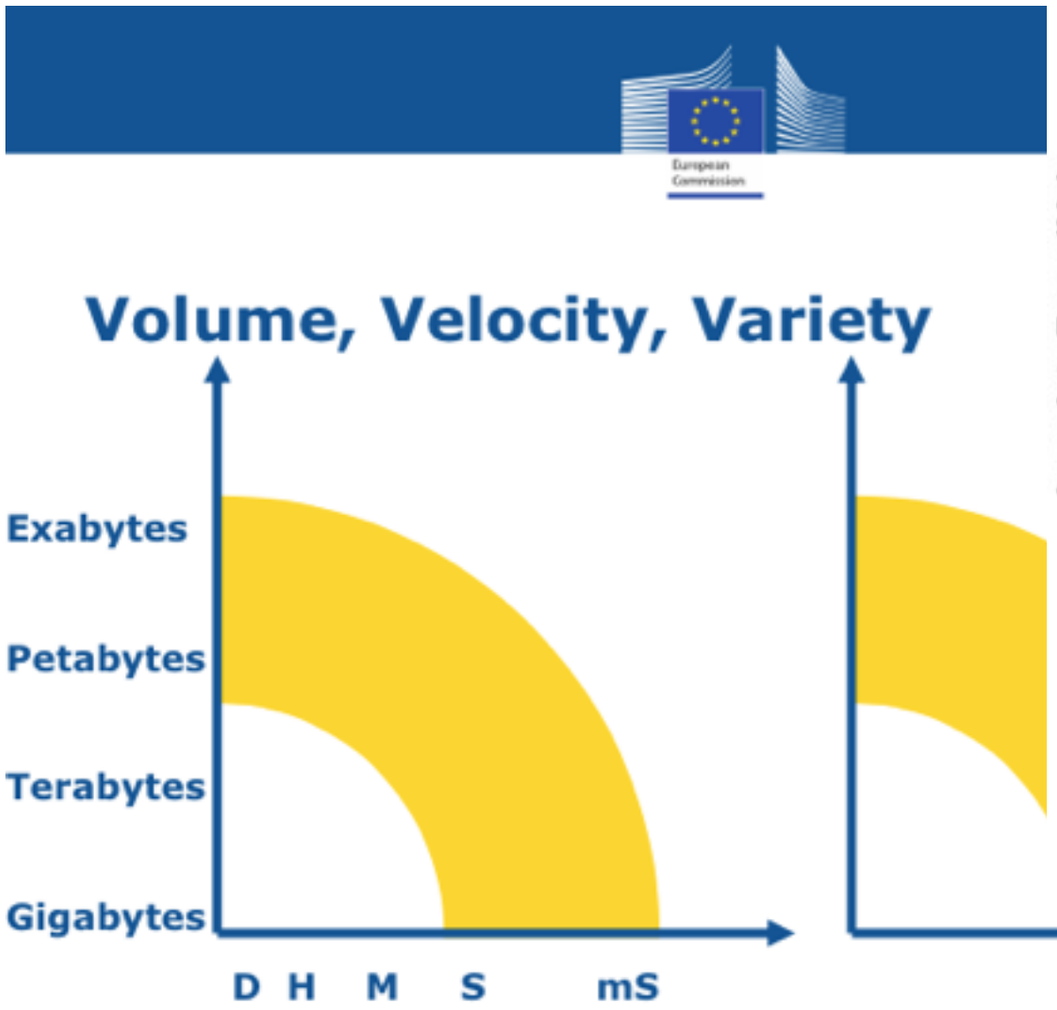
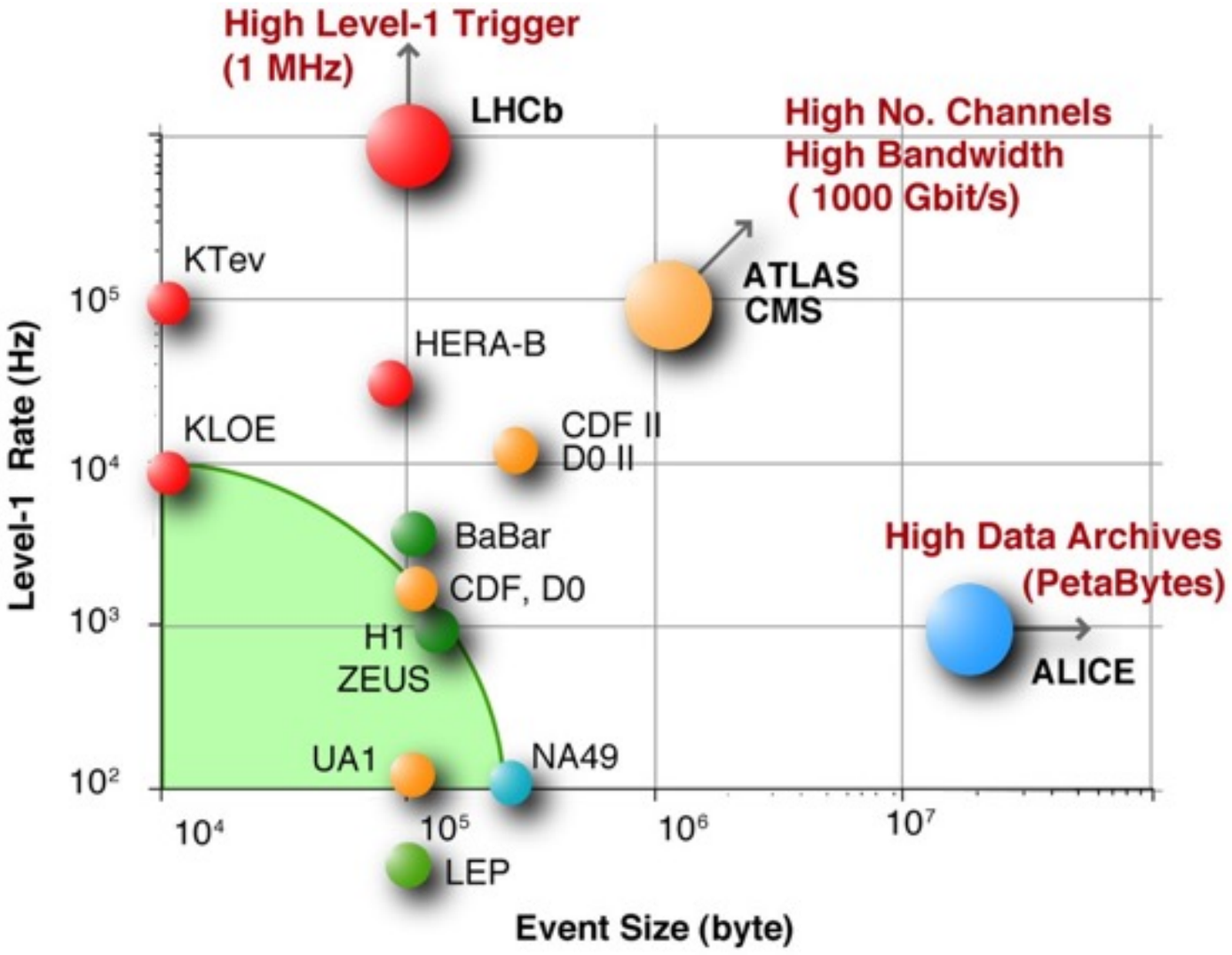
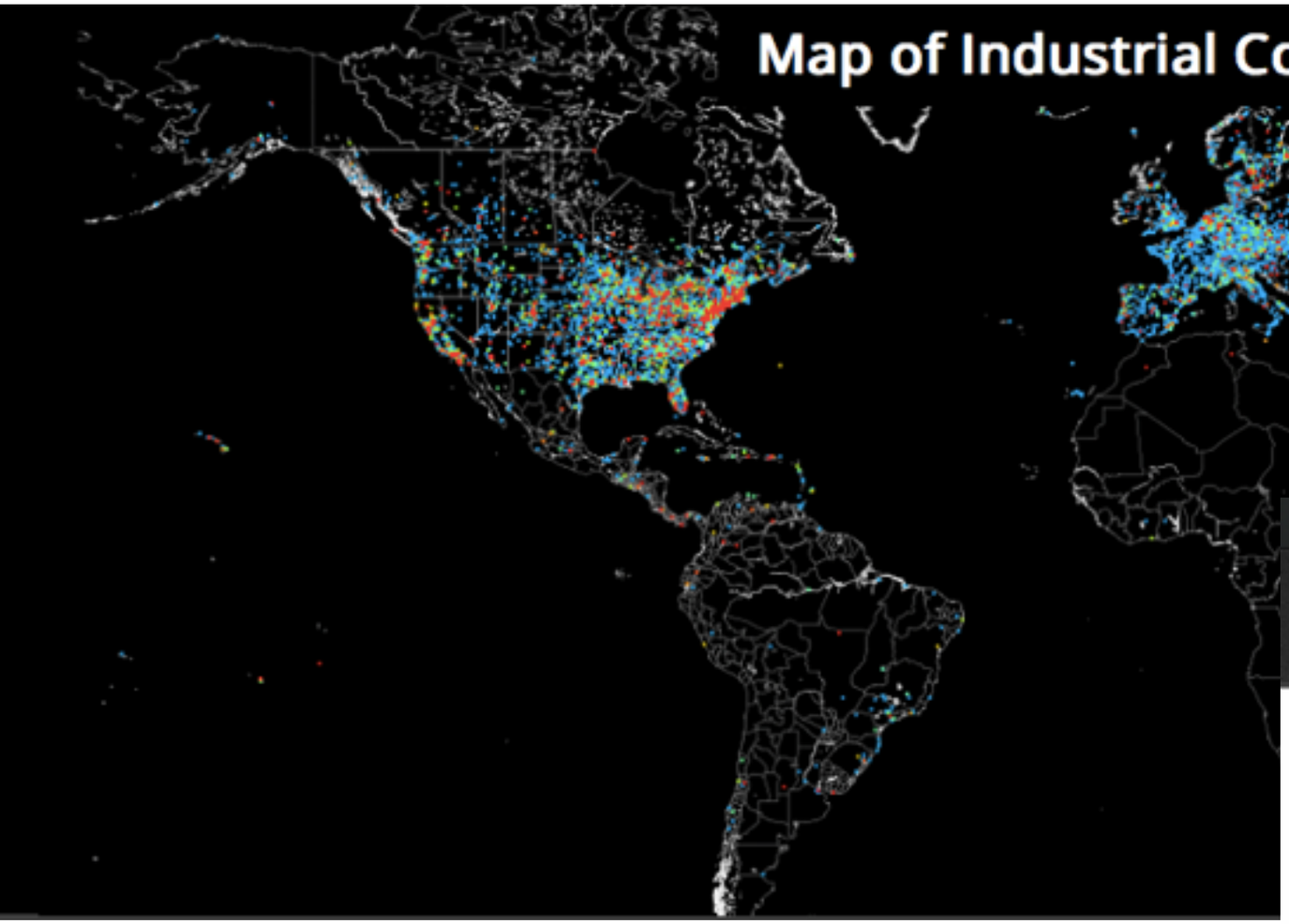
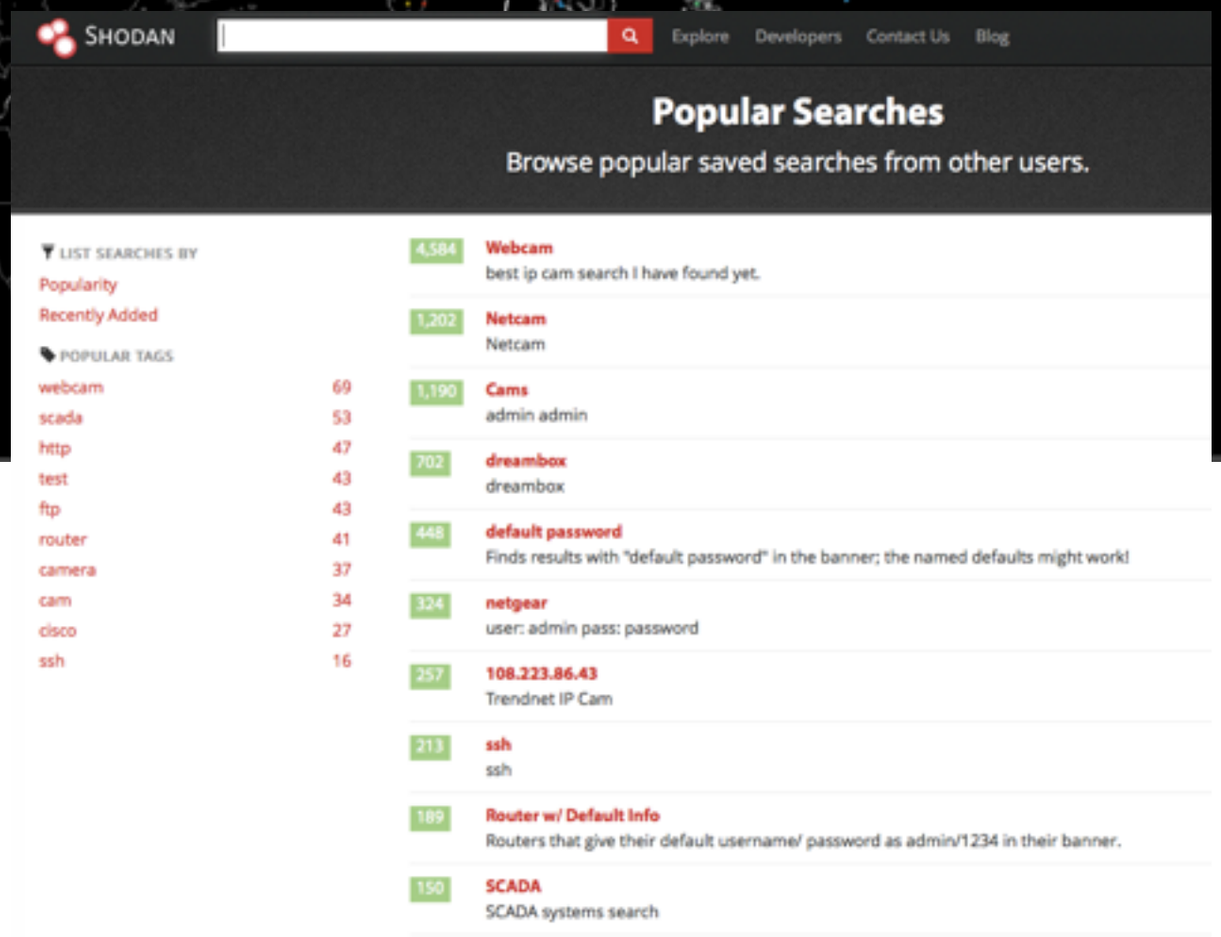




example of what we have **not** to do: Industrial Control System (ICS)





Wiki: **Industrial control system (ICS)** is a general term that encompasses several types of control systems used in industrial production, including supervisory control and data acquisition (SCADA) systems, distributed control systems (DCS), and other smaller control system configurations such as programmable logic controllers (PLC) often found in the industrial sectors and critical infrastructures

control room

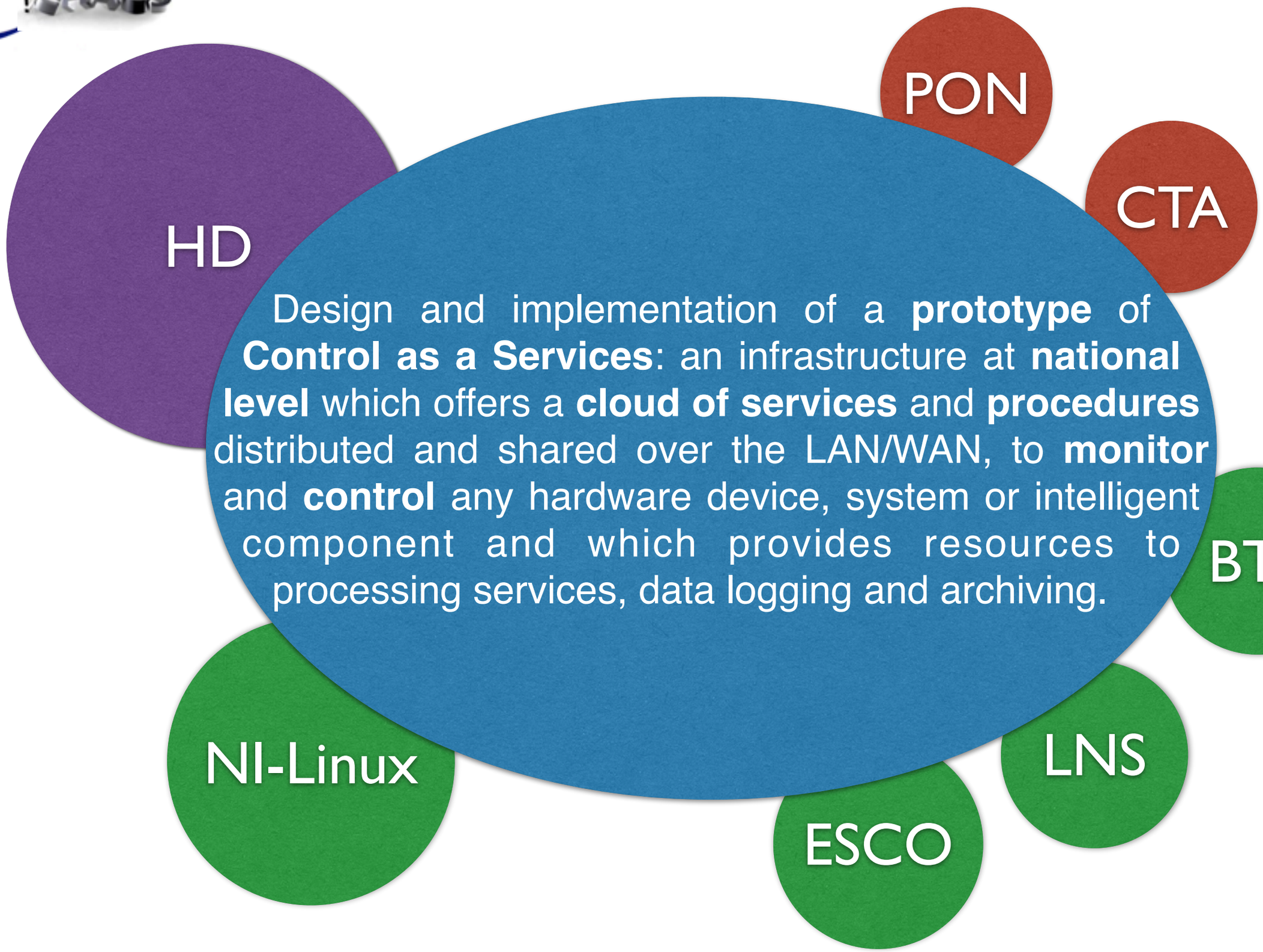
free format (variety)
process abstraction (value)
live data (visibility)
historical data (volume, velocity)

Controls & DAQ

control units (CUs)

device

Objective


HD
PON
CTA
Design and implementation of a **prototype** of **Control as a Services**: an infrastructure at **national level** which offers a **cloud of services** and **procedures** distributed and shared over the LAN/WAN, to **monitor** and **control** any hardware device, system or intelligent component and which provides resources to processing services, data logging and archiving.
BTF
NI-Linux
LNS
ESCO

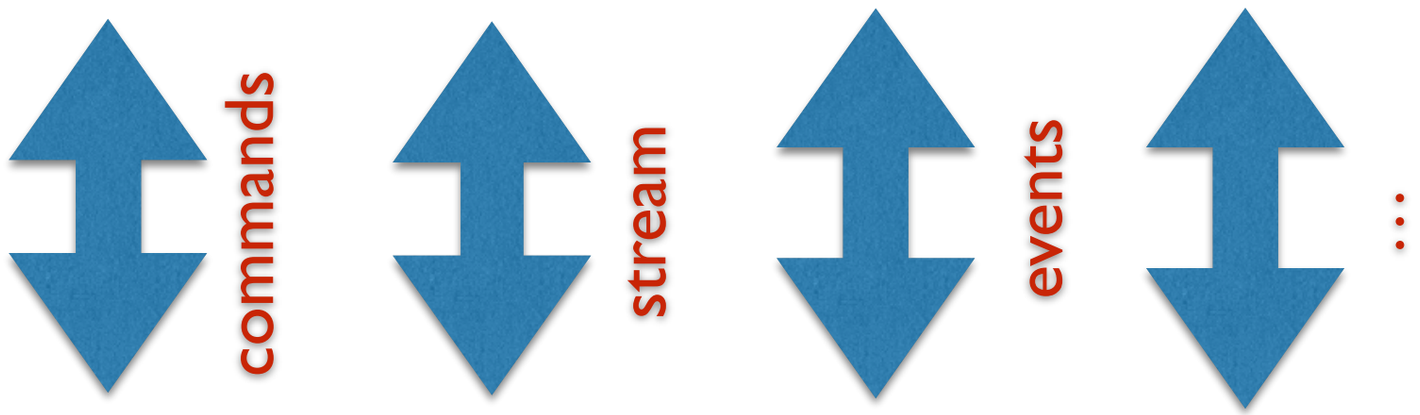
Controls as a Services - CaaS

Layer 0 - cloud infrastructure

Layer I - base services (hadoop, mongodb, etc)

Layer II - !CHAOS services (stream, events, commands, metadaservice, EU, ext)

Layer III - dashboard for !CHAOS services



user level

(!CHAOS) specific objectives

- Create an **open source** scalable platform for the control of large scale distributed sensors, complex devices, and **SoS**, based on the **latest information technologies**, ensuring high performance **throughput**, **scalability**, **reliability**, up with the growing demands of technology and market.
- Increase control's performance and **time critical application**
- Ensure, through **open source and open hardware**, greater availability on the market of devices and drivers.
- Lower, costs, and reduce development time.
- Overcome the problems of standardization and integration, ensuring **compatibility with all the most common standards.**
- Realize a **versatile and homogenous platform, ensuring historicization, storage, analysis, access** and presentation of polymorphic data.
- Demonstrate the **feasibility of a national platform, open, accessible, scalable and reliable to control polymorphic sensor/devices/SoS.**

Conclusion

- We had a slow start, but now we have to concentrate, many and effort are available; it's up to us make the project running.
- R&I mans that any idea have to pursue long term vision or same think not available on the market
- Research - from idea to prototipe - Innovation from prototype to market that mean Industrial Leadership
- H2020 and regional and national program are well addressed on specific topics, those are big data, cloud e IoT
- The objective of our project is still innovative, but we have to demonstrate it, all use cases and developments do not directly contribute to the success of the project and most of the time are not innovative