5th Hellenic Forum for Science,Technology and Innovation

Workshop on

Open Software and Open Hardware

HepTech-CERN

M.Barone

ILO and TT Officer for Greece @CERN

Workshop time line

- 14.30-14.45: Session Open and people settle down

  14.45-15.00: M.Barone -Session Introduction talk

  15.15-15.15: I.Tracey-Why we do TT and the power to take physics to the community.

  15.15-1530: JM.Legoff-Talk on the theory of Open Innvovation.

  15.30 -16.00: I.Tracey-Talk on where is the money. Public,Private, why governements give grants.

  16.00-16:30:Break

  16.30 -16.45:Pitch comp.

  16.45-17:15: JM.Legoff-Talk on Open Software and Hardware examples.

  17.15-17.30:M.Barone –Talk on examples.

  17.30-18.00 :I.Tracey –Talk on Open Biz model,examples,case study and workshop.

  18.00-onward:Questions

Introduction

- HepTech is an IP Network based out of CERN covering different fields as High Energy Physics,Nuclear Physics,Astroparticle Physics,Phothonics and so on.

  It is based on 26 nodes(Institutes or Labs) in 16 Countries.

- Its aim :Technology Transfer

CERN

- Is an International Organization for Nuclear Research made up by 22 Member States and the largest Particle Physics Laboratory in the World based in Geneva on the Franco-Swiss border.
- Greece is a founder member since 1954

- One of its aims is Knowledge dissemination

CERN OPEN SCIENCE.

- CERN provides open access to scientific publications,data and technology free of charge.
- Participates to the Open Sourse Software(OSS) Initiative,which brings society considerable benefits: cost saving, improved reliability and adaptability.
- Has extended this model to the Open Hardware Licences(OHL) to enable knowledge-exchange across a wide community of electronic designers.
- Its papers are published in Open Access-peer reviewed journals(SCOPA3)
- It gives a strong support to Open Innovation: Capturing,Evaluating and Utilizing new Ideas.

Industry 4.0

- IoT, Big Data, Data Analytics,Learning Machines , Artificial Intelligence , OSS and OHL ,Open Innovation are the engines of a novel Industrial Revolution:

Industry 4.0

which is a massive trend of increasing automation and efficiency in manufacturing processes with connected sensors and machines,autonomous robots and big data technology.

The Revolutions

1st :Mechanization,water power, steampower

2nd:Mass production,assembly lines,

- electricity

3rd: Computer and Automation

4th:IoT, BigData, Data Analytics , Cloud comp.

Open Source Software: Examples

- INDICO
- Is an open source conferencing tool used by about 200 sites world wide including the United Nations.

- Example: http://indico.cern.ch/e/ions2017

- Invenio
- Is an OS library management package typically used by digital libraries and document repository.
- The Cern Document Servers manage 1.5million bibliographic records.
- It was launched in 2002 by the IT Dep with the contribution of about 50 developers.
- Today is developed by a DESY,EPFL,FERMILAB,SLAC Collaboration.
- The solution came from 2 norvegian master students ,who went to CERN for a technology screening organized by the KT group.

- Alexander Nietzold and Kenneth Hole created
- the TIND Technologies Company ,registered in Norway.

- Today TIND provide technology support to CERN,UNESCO,California Institute of Technology,MaxPlank Institute as well as a companies.

- The website is: http://www.tind.io

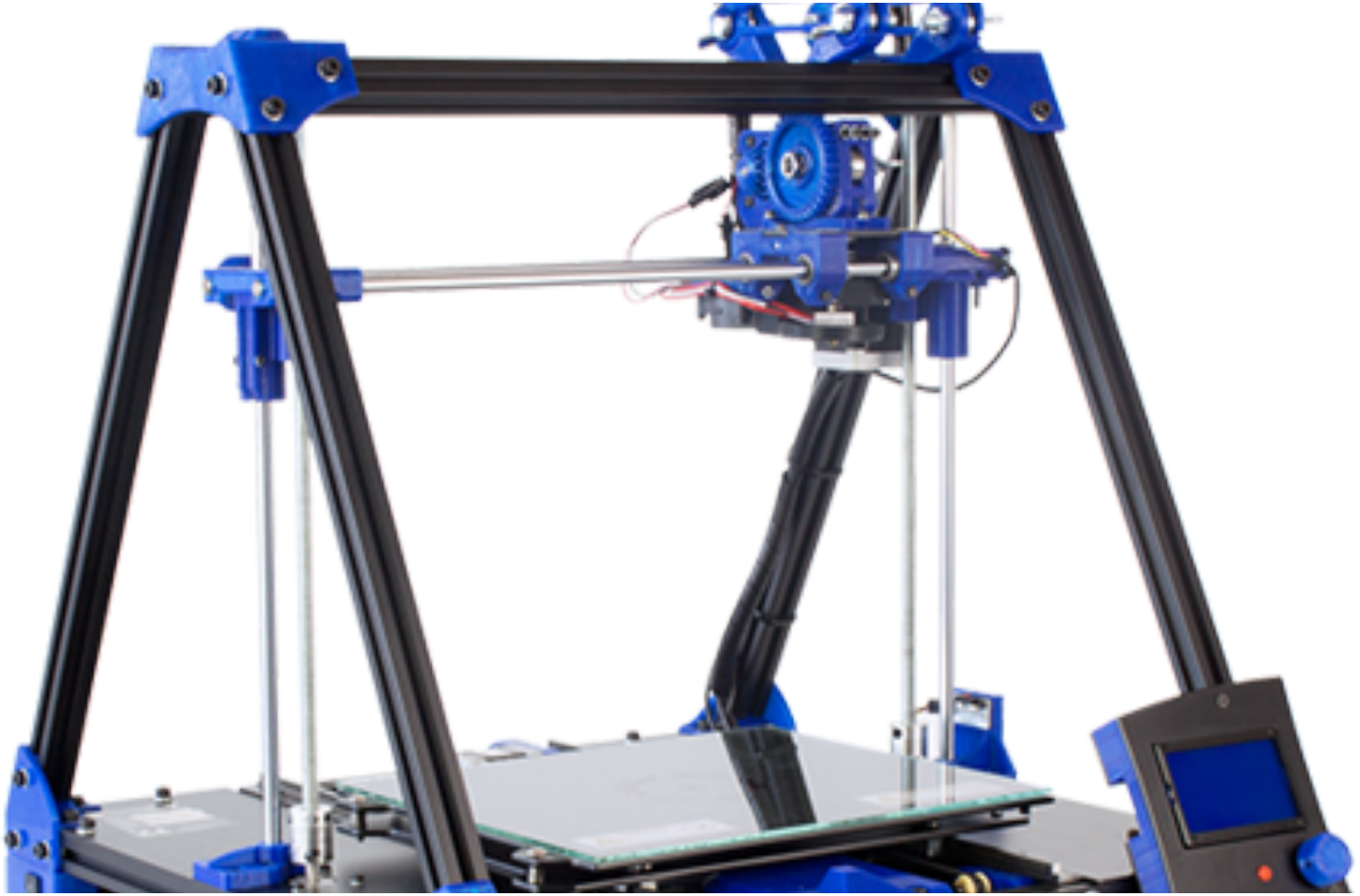
TIND team @CERN Data Centre

Open Hardware Licence(OHL): Examples

- A 3D Printable 3D Printer
- The Barcelona BCN3D Company, by making the design , schematics and documentation openly available under the CERN License , tap into the know-how and design capability of their user.
- In that way every body can make the the desired products that other way they could not being materialized.

BCN3D+:

An open source modular machine able to print with almost 3D printing materials



BCN3D IGNIS

A laser cutting machine ideal for industrial purposes and Fablab environments

http://www.bcn3dtechnologies.com

White Rabbit

- Is a protocol developed to provide a synchronization of more than 1000 nodes using the Ethernet network via fiber optic or copper connection up to a length of 10 km.

- It provides Flexibility,Reliability,Robustness and it is based on OSH and OSS made at CERN,GSI Universities and Industrial partners.

Applications-1

- At CERN particle circle the LHC 11.000/sec and the components of the accelerator complex, require minute timing accuracy and synchronization up to 10 picosec(10 to -12s).

FAIR Heavy Ions Accelerators Complex at GSI will adopt it .

Applications-2

- To Smart electrical grids to synchronize the production and the consumption of Individuals and Companies.
- It is under test of the Milan district in Italy.

- The name of the project refers to the White Rabbit in the Novel :Alice's Adventures in Wonderland.
- Reference : J.Serrano@Beam Department

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