INTRODUCTION

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CERN Ideasquare

INTRODUCTION
CERN & United Nations system

- Cooperation agreements with several UN organisations
CERN & Sustainable Development Goals

- Cooperation agreements with several UN organisations
The ERI’s, CERN included, deal with engineering and innovation challenges stemming from scientific progress.

Accumulated knowledge, capabilities and infrastructure aligned to drive advanced scientific field forward -> societal value and benefits are challenging to measure as the time from discovery to application is long.

How might we accelerate societal value creation (new technology, products, services, jobs, startups, etc) from basic research?
“Ideasquare is a human experiment that brings together physicists, engineers, industrial partners, early-stage researchers and cross-disciplinary teams of students to work together on detector upgrade R&D technologies. The purpose is to co-develop new technologies for research purposes, and at the same time, create a fruitful environment for socially and globally relevant new product ideas and innovation.”
IDEASQUARE IS

- Project with a dedicated building, hosting:
  - EU-funded detector upgrade R&D projects
  - Multidisciplinary master level student programs
  - Innovation events, workshops, hackathons
  - ...to prototype, test and iterate new forms of collaboration and co-creation in the areas of Research, Education and Technology - RET
EDUSAFE

EXAMPLE: EU-FUNDED DETECTOR UPGRADE R&D PROJECT

- EDUSAFE is a 4-year Marie Curie ITN project
- Training for 10 Early Stage and 2 Experienced Researchers
- Focuses on research into the use of Virtual Reality (VR) and Augmented Reality (AR) during planned and emergency maintenance in extreme environments
- 9 partners: AUEB, Canberra, CERN, EPFL, IASA, Novocaptis, Prisma, Roma II, TUM.
- 4 Prototypes produced
EXAMPLE: EDUSAFe ITN

EDUSAFe

• 3 main integrated functions:
  • Workers supervision: environment and activities
    • audio / video connection
    • environment parameters
    • health data
  • Gamma radiation camera
  • Augmented reality

(O. Beltramello, 2016)
EDUSAFe

• 3 main integrated functions:
  • Workers supervision: environment and activities
  • Gamma radiation camera
    • 360° scan, remotely controlled, motorized, light 3 Kg
  • Augmented reality
    • Detect the gamma hot spots in the environment and superimpose the real environment

(O. Beltramello, 2016)
EXAMPLE: MASTER-LEVEL STUDENT COURSE

- Challenge Based Innovation (CBI) is a 6-month MSc-level specialization course for product and service development, run by participating universities from (currently) 8 countries around the world.
- In the course, multidisciplinary student teams learn how to apply Design Thinking – a process for new product/service development; CERN researchers act as technological coaches in the process.
- "Work extremely hard, learn and have fun!"
- "Fail fast and often to succeed sooner"
EXAMPLE: STUDENT PROJECT PROTOTYPE
EXAMPLE: HACKATHON

- Organised by THE Port Association, hosted by CERN IdeaSquare and with partners from other non-governmental organisations, a three-day problem solving workshop hackathon with the theme “Science for Humanitarian Purposes”

- Example prototypes produced included: open-source cosmic ray detector, an assistive electronics suit to help mine detection dogs, an inflatable fridge for vaccines, a terrain-mapping tool for refugee camps, etc.

- Three runs completed with approx. 60 participants at CERN in October 2014-2016, next one scheduled for Spring 2017
HOW DOES IDEASQUARE WORK?

• Where is the magic? Bringing different people together. Empowering them. **Putting people first.**

1. Information doesn’t radiate (communication deprived at 4m distance, goes to nearly zero at 20m) (TJ Allen, 1976)

2. Single disciplinary teams do not radiate (single mindset leads thus far, but not beyond the rainbow)

• People from different backgrounds are amazed by each others skills... but only when they see them!

• Innovation is 1% about ideas, 99% execution & iteration: finding ways in which people can collaborate and co-create efficiently
FEEDING LOOP
Ingredients for Creative Collaboration

ESR researchers

Unknown factor - to be prototyped

Supporting events

CBI course students

SME’s

MNE’s

Experienced researchers
IDEASQUARE EXPECTED OUTPUT

- Human experiment = outcomes and measures for them are in development with in-situ research
- Communication, sharing ideas, spaces and resources improved in and between advanced technology development projects
- The counter-intuitive, controlled addition of variation, diversity, connections, ideas that are realised as prototypes to accelerate technology development
- Time span from discovery to application compacted
- Societal value of basic research more visible and tangible
- Education of future talent capable of working in basic research, commercial product & service development, or both
- Demonstrator for ATTRACT (= Large Human Collider)
ATTRACT
The Large Human Collider
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