Follow the WhiteRabbit! 
From FET to innovation 
(how to turn privacy from an obstacle into an opportunity)
Introduction

In this talk…

Share some interesting research and possibilities happening at the University of Trento

…but also discuss how we got there and how European programs helped nurture and mold our work and results
This is us
The SmartSociety Project

SmartSociety was a four year project started in 2013 and ending in 2016

- The SmartSociety Consortium was composed of:
  - University of Trento (Italy)
  - University of Edinburgh (UK)
  - U-Hopper SRL (Italy)
  - DFKI (Germany)
  - Ben Gurion University (Israel)
  - Imaginary SRL (Italy)
  - University of Karlstad (Sweden)
  - TUWIEN University (Austria)
  - University of Southampton (UK)

www.smart-society-project.eu
Main Objectives

To address our ever more complex socio-technical society SmartSociety proposed to progress towards the realisation of Hybrid, Diversity-Aware Collective Adaptive Systems

In particular we strive for systems with:

• **Compositionality**: humans and machines cooperate seamlessly by leveraging their respective strengths.

• **Diversity**: the ability to cope with the heterogeneity of agents, roles, possibly conflicting goals, data sources, language and semantics.

• **ICT-society co-design**: socio-technical systems should be designed and administered by considering ethical and social norms (e.g. privacy, cultural and legal settings).
Diversity in action - Subgoals and Plans

Arrive to the hospital at 9:00am

- Wake up
- Prepare for going out
- Go to the hospital
Diversity in action - Tasks and Roles

1. Wake up
   - Sound the alarm clock
   - Tell roommate

2. Prepare for going out
   - Eat breakfast
   - Leave the house
   - Get dressed

3. Go to the hospital
   - Take a cab (needs a driver)
   - Arrive at the hospital
   - Go to the bus stop

4. Meet a Doctor (needs a doctor)

Sensors Inform the whole process

- Clock
- Traffic Sensors
- Bus Data
- GPS
Diversity in action - Matching Peers

Sound the alarm clock

Eat breakfast

Take a cab (needs a driver)

Leave the house

Arrive at the hospital

Sign forms

Drive a cab (needs a 1+ rider)

Meet patients (needs patients)

Meet a Doctor (needs a doctor)

Arrive to work

Eat Lunch with Lisa (needs Lisa)
Scaling up to the real world
SmartSociety - Achieved results

1. The Computer Humanism paradigm: resulting from the convergence of Humanities and Computer Science that scales towards the collective intelligence
2. The related new sciences and disciplines: connecting the project's various research lines and building up to reach the paradigm
3. The SmartCollectives toolkit: a set of technical tools representing a first step towards our vision of a collective based computation
4. The Social Charter: representing the diversity in social values necessary to keep these complex systems working ethically in our society

Some metrics

Research: 75 papers (out which 20 were joint publications)
Innovation: SmartCollectives toolkit website, two funded FETLaunchpad proposals
Towards the end of the project naturally we started thinking about results.
During the project we noticed that representing diversity in profiles ended up requiring a lot of personal and possibly sensitive information (!)
We had work with a partner that specialized in privacy during the project.
Which lead us to consider (even before GDPR):
  • privacy by design
  • privacy policies
  • anonymization, among others
The first signs of GDPR were manifesting towards the end of the project.

This led us towards the “innovation side trip” that we called...
The WhiteRabbit Project

WhiteRabbit was a 16 month innovation action that started in 2016 and ending in 2017

- FET Innovation LaunchPad project
- Seed financing from FET to the real world!

- The WhiteRabbit Consortium was composed of:
  - University of Trento
  - Meta Group
From Data Anarchy to Data Bureaucracy

- Use of personal data almost unregulated
- Impacts users but also service providers
- Data will become as regulated as money (GDPR)
GDPR at a glance

- Data Protection Officer (DPO) Appointment Requirements
- Mandatory Data Protection Impact Assessments (DPIAs)
- Data breach notification requirements
- Data Control and the right to be forgotten
- Technical and organizational security measures
- Privacy by default and by design

...while not everything is new, it requires organizations to rethink the way they are dealing with personal data.
Complying with the GDPR

- Consent and proof of consent
- Purpose limitation
- Right of erasure and to be forgotten
- Right to restriction of processing
- Right of data portability and right to edit data
- Notice obligations
- Safeguards for automated decision making, including profiling

...to meet these new requirements, it’s vital to have an unified “360-degree view” of customers’ identities, their consent, and their preferences – across all touchpoints
The WhiteRabbit Product

- Low barrier of entry solution to GDPR
- Adaptable and evolvable data integration model
- For document/content management
- Aimed to small service providing companies
WhiteRabbit ➔ Digital University

- Ultimately WhiteRabbit was about porting research to business through:
  - Market Analysis
  - IPR & Patents
  - Piloting

- The new clarity of ideas and focus boosted our relation with other institutions

Leading us to the first direct application of our privacy by design Knowledge integration technology....
Digital University @ Trento

Digital University aims to turn University data into a valuable asset

- ensure data quality
- facilitate re-use
- in a privacy compliant way

Adoption

- First version: Sept 2017
- Becomes main version: May 2018
The Knowledge Graph
Welcome to the website of Trento Digital University!

Digital University is a repository of information on the members of the University of Trento and its units.

Information, including on teaching, publications, dissertations and funded projects, is collected automatically from different information systems, and is presented in this single instrument in a structured and exhaustive way, thus improving and completing the information offered by other University websites.

Research publications are available to everyone: in this way Digital University promotes an open access policy that removes barriers to scientific knowledge.

- **Search for someone in the University directory.**
- **Find out about our experts and their competences.**
- **Learn about the University’s statutory bodies, their functions, their members.**
- **Find out about the University’s departments and centres.**
- **Explore the University’s organization chart.**
WhiteRabbit → Wenet

- The evolved ideas from SmartSociety
- The experiences from WhiteRabbit and Digital University
- While continuing research into the broader topic of diversity

Led to…
The WeNet project

WeNet – Internet of Us

Start Date: 1st January 2019
Duration: 48 Months
Total budget: 6.5 M€
Coordinator: University of Trento
Prof. Fausto Giunchiglia

Final outcome: an online platform that will empower machine mediated diversity-aware people interactions

Web site: https://www.internetofus.eu/
The main overall goal of WeNet is to develop the culture, science and engineering, methodologies, algorithms, social interactions protocols and an online platform which will empower machine mediated diversity-aware people interactions.
WeNet Main Objectives

• Development of the **scientific foundations, methodologies and algorithms empowering machine mediated diversity-aware people interactions.**

• Development of the **WeNet online platform**, integrating and consolidating the implementation of the methods and tools developed as part of Objective O.1

• Large scale **Smart University pilot trials** in 18 different Universities and adult school sites and involve 10,000 participants.

• **Community building**, which will expand from the consortium to all institutions worldwide

• Ensure a **clear ethical guidance for the technology development** and the pilot activities
WeNet Pilots

WeNet will run multiple pilot trials

• 18 worldwide sites, including universities and adult school
• 10,000 participants throughout the whole duration of the project

Pilots will run at:

• August 2020 (M20)
• December 2021 (M36)
• August 2022 (M44)
The i-Log app

Collect streaming sensor data
The application can collect up to 39 streams of sensor data from the user smartphone, generating up to 1GB/day

Collect user annotations as Time Diaries
The user is the only one who can correctly annotate her day life situations so that the machine can learn how to recognize them in the future. Monitoring user interactions

Configurability and adaptability
The application adapts to different use cases and to different smartphones

Provide services
i-Log is also the platform that will provide service back to the users, generated from the knowledge extracted from her data
Human in the loop

At Aeroporto di Milano Linate, you:

- Reached your destination
- Briefly stopped to change transportation mode
- I don't remember

Which mode of transport you used?

- Train
- Bus
- Cableway
- Private bycicle
- Electric private bycicle

Please pinpoint on the map where you changed transportation mode:
Closer to managing Diversity?

SOCIAL HUB

Q(P)

A(P)

A(P)

Q(P)

INTERNET

INFORMATION HUB

Q

A

WWW.INTERNETOFUS.EU

© 2019-2022 WeNet
A long way from home but not there yet

Result Application

Codename WhiteRabbit

Towards the Future!
Thank you!

Knowdive Group
- Website: http://knowdive.disi.unitn.it

SmartSociety Project
- Website: http://www.smart-society-project.eu/

Digital University @ UNITN
- Website: https://www.unitn.it/en/DU/info

WeNET Project
- Website: www.internetofus.eu
- Email: info@internetofus.eu
- Twitter: @WeNetProject