Project LOCUS

LOCalization and analytics on-demand embedded in the 5G ecosystem, for Ubiquitous vertical applicationS

https://www.locus-project.eu/

Main info

- Budget: 6 M€
- Starting date: 1/11/2019
- Ending date: 01/11/2022
- Duration: 36 months
- https://www.locus-project.eu/

Partners

Consorzio Nazionale Interuniversitario per le Telecomunicazioni	IT
Ericsson AB	SE
Ericsson S.p.A.	IT
IBM	IE
NEC	DE
Orange	FR
OTE	GR
Samsung	UK
VIAVI	FR
Incelligent	GR
Nextworks	IT
IMDEA Networks	ES
University of Malaga	ES

Background

- Context-awareness is essential for a variety of existing and emerging applications
  - Context depends on location information of people and things
- However
  - current navigation satellite systems work accurately only outdoor
  - 4G cellular systems fail to provide high-accuracy (and indoor) localization
  - other short-range localization technologies (e.g. WiFi) imply high deployment/maintenance/integration costs
  - application developers need to master and integrate several heterogeneous and hardly interoperable “add-on” technologies

Background

- Lack of a reference context **analytics** infrastructure
  - stakeholders need to operate on raw spatiotemporal data
    - consequences not only in terms of work, but also in terms of privacy.
- Raw spatiotemporal data should be pre-processed, so as to extract hidden features/behaviours of physical targets to be leveraged for smart service provision

Project concept

- Design and develop a location management infrastructure capable of improving localization accuracy and security, and to extend it with physical analytics, and extract value out of it, meanwhile guaranteeing the end users' right toprivacy
- Make localization and related analytics a first class citizen in the cellular world: the evolution of 5G, both in the short and in the long term, must address not only communication but also localization functionality

Project concept

- Localization, analytics, and their combined provision “as a service” will greatly increase the overall value of the 5G
  - network operators to expand their range of offered services
  - devices, persons and things are detected, localized, and tracked with high accuracy, minimal implementation cost and maximal privacy preservation (e.g., for crowd counting and flowmonitoring)
  - localization of terminals will also be exploited to improve network performance and to better manage and operate networks

Technical Concept: 7 goals

1. System architecture with built-in security and privacy
2. 5G Terminal Localization, a cellular-based localization thought of as an evolving functionality in terms of performance
3. Integration with non-3GPP localization technologies (GNSS, WIFi, Bluetooth, etc.)
4. Device-free localization technologies: solutions to use base stations and other transmitters present in the environment as “illuminators of opportunity” for passive radar, and to localize also passive targets (people and things)
5. Analytics, Learning and Inference: analyse the behaviour of devices and targets
6. Network management: exploit localization information and advanced data analytics to enhance network management
7. Exemplary localization-based services: empower exemplary services

Scenarios and proof of concept

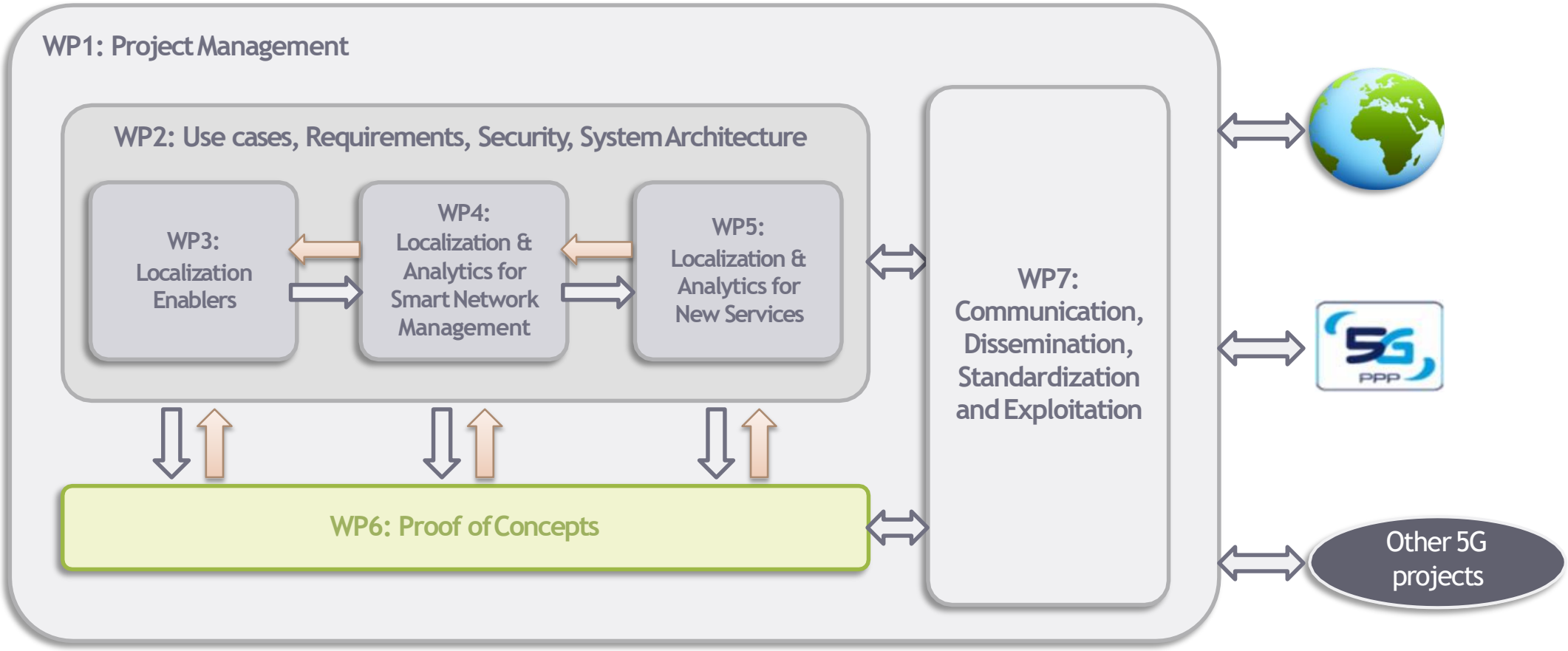
1. Smart network management based on 5G equipment localization
2. Network-assisted self-driving objects
3. People mobility & flow monitoring

Feasibility and impact

- Freedom to act on the 5G system specification and availability of software network paradigms make it possible to radically improve the future 5G network by endowing it with on-demand localization and dedicated analytics
- Enabler of new/improved applications for the 5G ecosystem, boosting EU vertical industries

- **The project is a tool and not an aim in itself**

Work packages



Effort Table

	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person/ Months per Participant
CNIT	**20**	13	29	10	8	5	**8**	**93**
Ericsson AB	0	0	24	0	0	0	9	**33**
Ericsson S.p.A.	0	4	0	0	12	**12**	2	**30**
IBM	0	6	0	8	**40**	6	2	**62**
NEC	0	2	0	0	26	10	6	**44**
Orange	2	8	0	**25**	0	5	5	**45**
OTE	2	7	6	2	0	6	4	**27**
Samsung	0	8	**20**	4	8	10	8	**58**
VIAVI	0	1	7	2	14	14	2	**40**
Incelligent	0	**7**	7	8	12	22	6	**62**
Nextworks	0	6	0	24	16	12	5	**63**
IMDEA	0	0	32	14	0	2	2	**50**
University of Malaga	0	6	12	32	0	15	5	**70**
Total Person/Months	**24**	**68**	**137**	**129**	**136**	**119**	**64**	**677**

Thank you. Questions?

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