

UMOBILE QUARTERLY REPORT

Action full title: *Universal, mobile-centric and opportunistic communications architecture*

Action acronym: *UMOBILE*

Grant Agreement number: 645124

Period covered: M16 – M18 (May 2016-July 2016)

A) UMOBILE achievements of the last reporting period:

WP1:

- 5th internal management report preparation and submission
- 4th consortium physical meeting coordination (scheduled for September 2016)
- 26/5/16 Technical teleconference & Project Coordination Committee meeting - agenda and minutes preparation.
- 20/6/16 Technical teleconference & Project Coordination Committee meeting - agenda and minutes preparation
- 28/7/16 Technical teleconference & Project Coordination Committee meeting - agenda and minutes preparation
- Periodic report preparation
- Deliverable 1.3 preparation and submission
- Mailing lists maintenance

WP2:

- Discussion regarding the possible change in the submission date of D2.3. It was decided to release a version of this deliverable by M28.
- Discussion on the preliminary system specification and the structure of D2.3
- Contributions to the network deployability design aspects of Task 2.3
- Validation of scenarios to match the system and network requirement specifications

WP3:

- Task 3.1/Task 3.2: Progress towards the integration of the NDN and the IBR-DTN implementations
- Task 3.1: Preparation and submission of D3.1 (on M16) which describes in detail the different components of the UMOBILE architecture and their implementation status
- Task 3.2/Task 3.3: Development (early specification) of the sociability software module and potential application of the PerSense usage context tracking in the context of routing (contributions to a paper describing a “smart routing” approach by UMOBILE)
- Task 3.3: Progress on the joint publication on a smart routing framework
- Integration of the NDN communication protocol with virtualization technologies (e.g., Docker) to support service migration
- Development of a push and pull service over NDN and application in the implementation of a smart lighting system. These results were published as a research paper accepted as a poster in ACM SIGCOMM 2016.

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- Implementation of the keyword-based mobile application sharing solution (KEBAB-COM/NET) over Android
- Development of the SOCIO framework able of supporting opportunistic communications based on dLife (social-aware opportunistic) forwarding protocol.
- Development of the Oi! Application (short-messaging app) based on the SOCIO framework, to exchange information opportunistically, in large-scale scenarios.
- Experimental validation of the Oi!/SOCIO framework in a real scenario: preparation of publication.
- Bluetooth support integration on the NFD forwarding engine with the aim of providing the smart routing technique with the option of using Bluetooth connectivity for neighbour detection.
- Study on the integration of the planned architecture with UAVs.
- Set up of the UMOBILE Lab. The Lab was presented to the Consortium members during the July teleconference. The Lab components were prepared according to the results of the related tasks and the discussion in Xanthi during the plenary meeting and during the following day.
- The paper on the keyword-based mobile application sharing solution (KEBAB-COM/NET) has been submitted and accepted in the 11th ACM Workshop on Mobility in the Evolving Internet Architecture (MobiArch) 2016.
- The paper on Information-Centric Connectivity, submitted to the IEEE Communications Magazine, has been accepted and will be published in August.
- The paper about the Information-Centric Connectivity solution, with an extension of the performance evaluation that we have submitted to the ACM ICN 2016 conference on the 15th of May has been rejected.

WP4:

- Task 4.1: Discussion on the congestion control mechanisms that the UMOBILE platform will support
- Task 4.1: Support for meetings to assist in a more clear analysis/design of congestion control aspects in UMOBILE
- Task 4.2:
 - Continuation of the work started in the prior period for data collection and inference of affinity networks based on digital networking footprint.
 - Improvement of the wireless tracking application PerSense Mobile Light (available as beta via Google Apps), for the research community:
<https://plus.google.com/communities/104874036636715946374>
http://www.umobile-project.eu/projectdocs/images/2/21/2016-04-12-UMOBILE_PerSenseLight_Senception.pdf
 - Paper “A Characterization Study of Human Wireless Footprints based on non-intrusive Pervasive Sensing” resubmitted to IEEE JSAC (special issue). This scientific paper has been submitted and accepted in MobiArch2016 as short paper which meant reducing the paper from 10 to 3 pages and as such, the authors have opted out of MobiArch2016 and resubmitted the paper to IEEE JSAC special issue “Human-In-The-Loop Mobile Networks”.
 - Traces collected for the period of 1 month, in Lisbon, 7 users / traces to be available via CRAWDAD.

- Task 4.3: Initial aspects of naming by assisting the debate of operational aspects in the context of naming application into UMOBILE routing aspects
- Task 4.3: Analysis on prioritization rules to consider in naming (based on behavior inference and “sociability” forecasting).
- D4.1 (Flowlet Congestion control – Initial report) submitted in July 2016
- Results of the implementation of the In-Network Resource Pooling Protocol (INRPP) included in D4.1
- Finalization of the design of service placement algorithms. The preliminary evaluation was conducted over the Guifi network. The outcome is a research paper accepted in IEEE LCN 2016.
- Meeting between UCL and UCAM partners in London to discuss the challenges in the architectural design of QoS framework which will be useful for the development of flowlet congestion control and different QoS services.
- Submission of a paper in the ACM CoNEXT conference on the 17th of June.
- Approach to the operation planned in the WP. First analysis of the opportunity to recruit people as UMOBILE app users.

WP5:

- Teleconference that marked the start of Task 5.1
- Task 5.3: Contributions to the UMOBILE Lab proposed by partner AFA, via the integration of an application derived from the PerSense Mobile Light app developed by Senception in the context of UMOBILE.
- Initial draft of the UMOBILE demonstration scenarios, which will be part of deliverable D5.1 “Validation methodology and evaluation report”.
- Initiation of work outlining the final demonstration, including internal discussions regarding the integration of UAVs

WP6:

- Results presentation at ACM MobiSys Dronet 2016, ICNRG interim meeting, IEEE LANMAN 2016, IFIP Networking 2016 conference, “Expoemergenze”, WWIC 2016
- Cleaning of traces (to be provided via CRAWDDAD).
- Proposal of a PerSense Mobile Light for ACM MobiHoc 2017 demo, app contest
- Updates on the Facebook profile, on the project & beneficiaries websites
- Deliverables 6.2 & 6.4 preparation and submission
- Dissemination of UMOBILE on COPELABS Scientific Advisory Board meeting (May 5th and 6th in Lisbon).

B) UMOBILE actions planned for the next 3 months:

WP1:

- Organisation of regular teleconference on August.
- Arrangement of the 5th physical meeting (21-22 September)
- Periodic report submission
- Review meeting (20 October 2016)
- Consortium coordination

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- Maintenance of the project's mailing list

WP2:

- Work on the system and network requirements report (D2.3), as well as system and network deployability report (D2.4)
- Collection of traces in different locations worldwide, with the purpose of characterizing affinity networks and human mobility (based on Wi-Fi direct, with tool PerSense Mobile Light).

WP3:

- First fully integrated version of NDN and IBR-DTN by October
- Analysis of work on Task3.1, related to the usage of the DTN and ICN architectures on the UMOBILE abstraction layer.
- Work on Task3.3 related to the specification of the first version of the UMOBILE smart routing proposal.
- New version of the paper about smart routing.
- Migration of the Oi! app and SOCIO framework to the NDN platform.
- Beginning of the development of the Now@ application (local news app) based on a new version of SOCIO, which all integrate also the SCORP forwarding protocol to disseminate data based on users' social behaviour and data interests.
- Development of a service migration on an NDN architecture and evaluation over the UMOBILE testbed.
- First version of the implementation of the KEBAB-COM/NET solution over Android
- Evaluation of the routing solution presented in the IEEE LANMAN 2016 paper.
- Specification of the interface between the available modules/UMOBILE apps that may produce user-related information and definition of how to exploit that information in order to develop an enhanced (smart) routing and forwarding engine within the UMOBILE architecture.
- Contribution with a light API capable of tracking affinity networks and correlating such networks with a social routine behavior (integration of user context and usage context) - ongoing work, sociability forecasting module
- Contribution to the networking definition and integration of the social routine module (UMOBILE context plane).
- Upgrade of the UMOBILE Lab with the latest UMOBILE libraries (e.g. ndn-cxx_umobile libraries, etc.)
- Internet draft (ICNRG) describing SCORP routing protocols.
- Feedback regarding the UAV integration

WP4:

- Work on QoS and flow control.
- Work on QoS at service level while considering the service placement algorithms.
- Work on name-based replication
- Work on the INRPP extension for NDN networks and the UMOBILE architecture for the D4.2
- Steering of the common vision of WP4, by assisting convergence between the three different tasks towards the proposed goals.

- Validation of some aspects of context derived from the PerSense tool; adjust it as required by UMOBILE.
- Recruitment of users of the UMOBILE app(s) and start of the operations related to the data collection.
- Extension of the paper submitted to CoNEXT conference about INRPP

WP5:

- Inputs to the demo story document provided by FON
- Input to the validation methodology and evaluation report
- Definition of a demo to be shown during the review meeting in Brussels
- Mid-term proof of concept to showcase the final demo plans regarding the implementation of a hybrid method to be applied as (smart) routing and forwarding engine integrated within the UMOBILE architecture
- Planning and preparation of the final demonstration setup. Planning of the UAV integration and adaptation for the demonstration.
- Development of a demo story concerning sociability forecasting and its potential applicability in the context of routing.
- Integration of the PerSense Mobile Tool in the UMOBILE Lab.
- Simulation of planned demo trials in the UMOBILE Lab.

WP6:

- Project results dissemination.
- Poster presentation in ACM SIGCOMM 2016
- Results presentation in MobiArch workshop
- Potential submission of one scientific paper about the new concept of smart routing.
- Potential submission of one scientific paper about Oi!/SOCIO framework.
- UMOBILE newsletter circulation via several channels
- Submission of scientific study concerning roaming behavior with poles worldwide
- Potential contributions to Internet drafts: GAIA, ANIMA.
- Select non-academic magazines to popularize the UMOBILE activities.
- Increase activity via the social networks

C) Problem/risk arose during this period, or any risk foreseen on the future and decisions taken to handle them:

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D) Resources used during the period in a project level:

(Double-click on the following table to edit cells in Excel)

WP	No of pms	Personnel Cost	Travel	Equipment	Other	Subcontracting	Subtotal	Indirect costs	Total costs
1	2.55	10733.93	282.68			0			
2	3.95	15587.35				0			
3	14.10	52564.31		3230.42		0			
4	12.14	43110.11				0			
5	3.79	17350.56				0			
6	4.61	20620.62	2394.67	208.88	2811.8	0			
	41.14	159966.88	2677.35	3439.3	2811.8	0	168895.3	42223.83	211119.1

E) Short description for other direct costs:

Travel costs for physical meetings, travel costs for dissemination (MobiSys-Dronet conference, WWIC 2016)

Equipment for experimental settings & storage, mobile devices for development an experimentation, Rasp PI, laptop and accessories for development the service migration platform.

F) Deviation from Annex 2 and/or paragraph 2.3.5 including subcontracting:

Minor deviations in project months (1-2 personmonths).

G) Evaluation of the implementation of the project workplan: Gantt chart control, milestones and indicators:

The Project is implemented according to the plan. Specifically:

Period Milestones: MS1, MS3, MS11 and MS12 are accomplished according to the plan. The next milestones are scheduled for Month 30.

Period Deliverables: All deliverables are submitted according to the grant agreement timetable. D4.1 was submitted on M18 (UMOBILE Coordinator asked permission on the behalf of the consortium to submit "D4.1 Flowlet Congestion -Initial Report" on month 18, as described in page 22 of the grant agreement instead of Month 12 included in the deliverables tables. The change has been accepted).

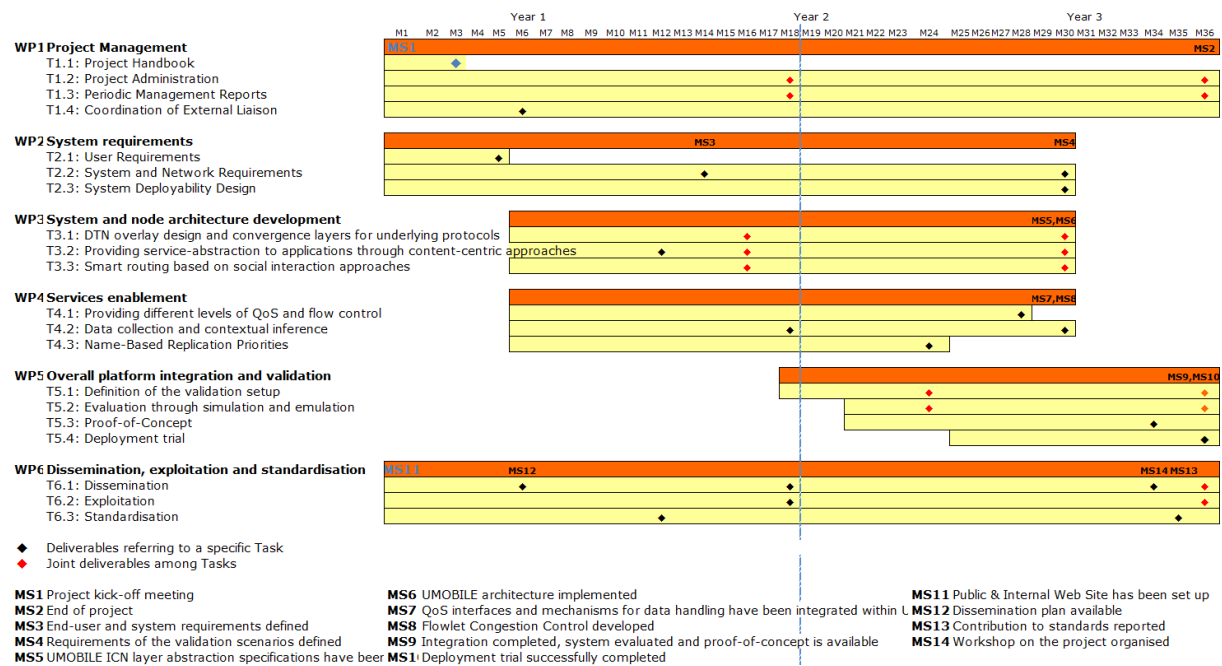
The table below summarizes the UMOBILE activities for the period May 2016-July 2016:

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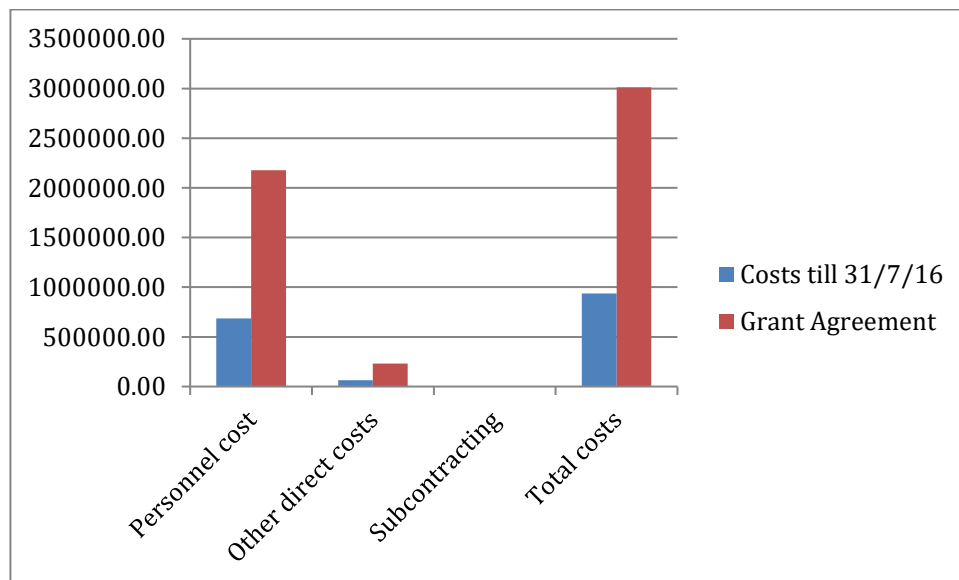
M..	Project Month	Meeting	Deliverable	Milestone	Report	Additional events
M16	May 2016	teleconference: 26/5/16	D3.1 UMOBILE architecture report		3 monthly report for: M13 to M15	ACM MobiSys Dronet 2016, ICNIRG interim meeting, IEEE LANMAN 2016, IFIP Networking 2016 conference, "Expoemergenze"
M17	June 2016	teleconference: 30/6/16	-	-	-	
M18	July 2016	teleconference: 28/7/16	D1.3 Project Management reports	-	1st periodic report	
			D6.2 Dissemination Report			
			D4.1 Flowlet Congestion Control-Initial Report			
			D6.4 Exploitation Plan			

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An updated gantt chart follows:

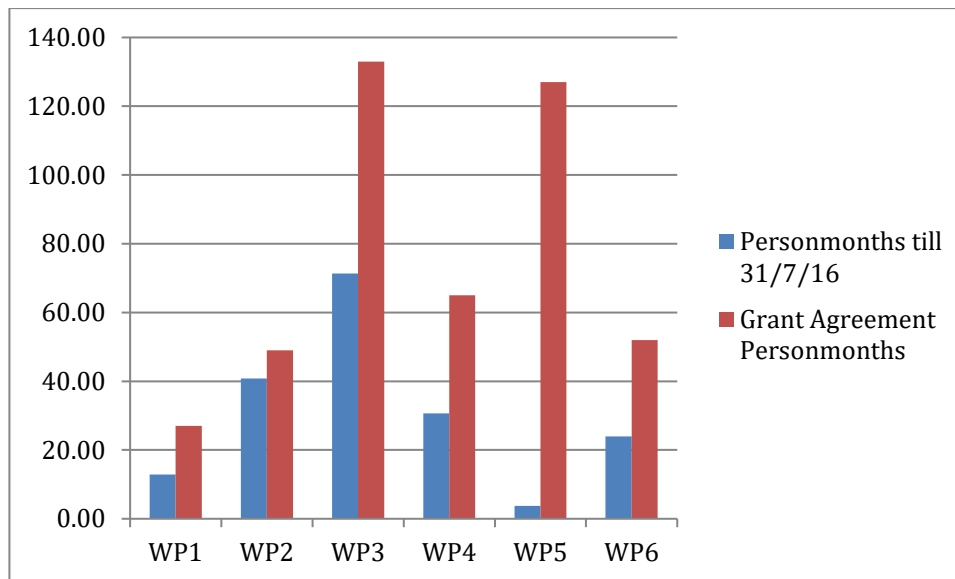


31.05% of total budget has been consumed for the activities described above (31.46% of the personnel costs, 27.21% of the other direct costs, 31.06% of the indirect costs), as presented in the following graph:



40.47% of the personmonths have been consumed for the activities described above:

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This report was written by DUTH on the behalf of the UMOBILE consortium