Small or medium-scale focused research project (STREP) proposal
ICT Call 5
FP7-ICT-2009-5

Universal Laptop Dock

ULD

Small or medium scale focused research project (STREP)
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Work programme topic addressed
Universal Laptop Dock

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Participant no. *	Participant organisation name	Part. short name	Country
1 (Coordinator)	University of Belgrade Faculty of Mathematics	MATF	Serbia
2	Technical University of Munich, Department of Informatics	TUM	Germany
3	Dragon Innovation	DI	Germany
4	Infectra	I	Sweden
5	Sixsentix GmbH	S	Austria

Proposal abstract

In recent years, the number of smart phones on the global level has significantly increased. The smartphone has became part of everybodys life.
It is your point of connection with the people and the world around you. It is also an incredilbe powerfull computer. The speed and power of our smartphones rarely holds us back but the small

screen and limited interfaces often do. In past years capabilities of our smartphones has improved but small screen problem remained. An attempt to increase phones screen failed due to it was causing phone bending when wearing in pocket. And there is a problem of holding a large phone in a hand. Then main task of the ULD project would be to improve the way in which smartphones are being used. Idea is to take adventage of smartphones powerfull cpu and solve problem of small screen and limited interfaces.

Section 1: Scientific and/or technical quality, relevant to the topics addressed by the call

1.1 Concept and objectives

Recent studies have shown that average person buys new smartphone every 1-2 years. And if you have to upgrade an old laptop for purposes in which you can't use your smartphone it will const you extra time and money.

The ULD project is an attempt to combine smartphone and laptop in one device. Your will have to connect your smartphone with laptop, run our application on your smartphone and then you can use your smartphone on your laptop. It will allow comfortable usage of all mobile applications on your laptop. So next time you upgrade your smartphone you will upgrade your laptop as well.

The ULD project would include application that will allow smartphone usage over laptop and latop model. Our laptop model will contain keyboard, touchpad, screen, battery and connction ports.

Objective 1: Choose type of smartphones operating system

Since smartphone will be our main source of power, it will run application that will allow displaying and usage of all application from that smartphone.

Success criteria:

- Smartphones operating system is widely used.
- Phones with choosen OS have good hardware capabilites

Objective 2: Smartphone application implementation

Implementing application that will allow displaying and using of all smartphone applications on laptop.

Success criteria:

- All applications are displaying on laptops display.
- Application is allowing laptop to use wifi and bluetooth of smartphone.

Objective 3: Choosing connecting components

Choosing right connection between smartphone and laptop.

Success criteria:

- Easy to plug in
- Easy to carry
- Durrable
- Easy to reuse

Objective 4: Building laptop model

Making laptop model prototype over which smartphone will be used. It will have keyboard, touchpad, screen, battery and connction ports.

Success criteria:

- Functional components
- Easy to use
- Durable

Objective 5: Testing the project

The project is being tested in MATF with a help of DI and TUM. Tests includes performance tests, UI tests, stability tests.

Success criteria:

- The devices passed the performance test.
- The devices passed the UI tests
- The devices passed stability tests

1.2 Targeted breakthrough and long-term vision

Popularity of smartphones is growing and growing every day and so are expetations of new smartphones. As smartphones are getting every time more and more powerfull CPU-s it is opening a new ways for smartphone usage.

Idea behind ULD is to make an application that will make your smartphone function like fimiliar desktop operating system with mouse cursor, keyboard shortcuts, desktop class browsing and easy file management. Laptop model that will be made in ULD project will look like standard laptop but it will not require motherboard, CPU, GPU. It will not warm from usage and make that unpleasent experience of typing on hot keyboard. It will have aluminum case and cost a fraction of standard laptops price. It will also be a lot lighter then regular laptop and it will allow easy carrying in backpack or in suitcase.

1.3 S/T methodology and associated work plan

1.3.1 Describe the overall strategy of the work plan

The proposal consists of five work packages. The zero work project refers to management. The following work packages refer to the implementation of software and assemly of all components. The last work package only applies to product testing, as various users try and eveluate the product.

1.3.2 The timing of the different WPs and their components

Start of the project: 01/01/2018

End of the project: 10/11/2019

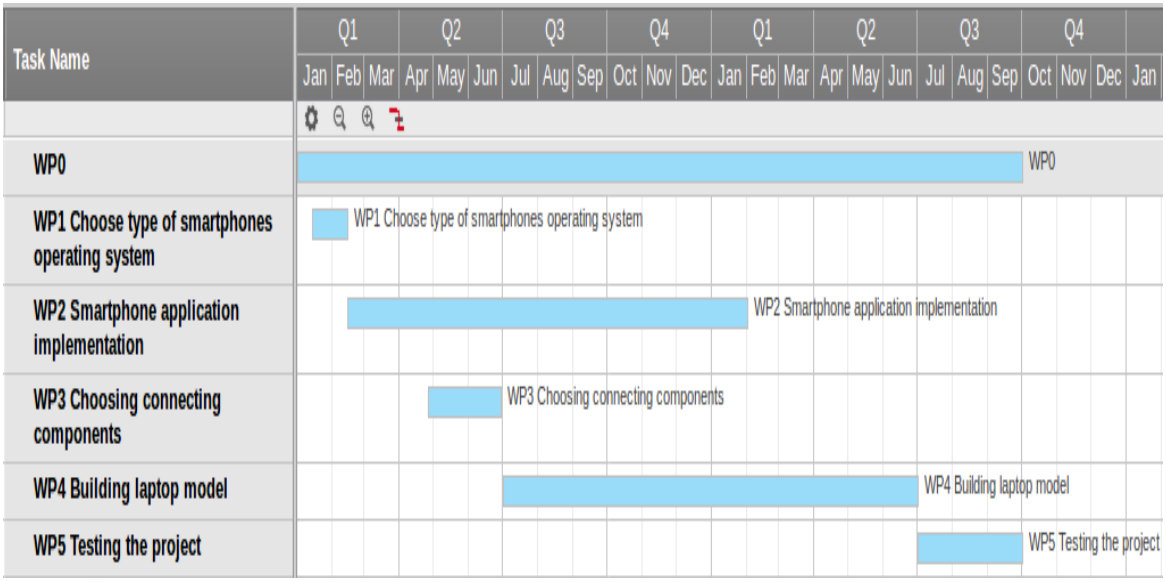

Table 1.3a: Template – Work package list

Work package list

Work package No[1]	**Work package title**	**Type of activity**	**Lead partic no**	**Lead partic. short name**	**Person-months**	**Start month**	**End month**
WP0	Project management	MGT	2	MATF, TUM	42	M1	M21
WP1	Choosing type of smartphone operating system	RTD	1	MATF, TUM	2	M1	M2
WP2	Smartphone application implementation	RTD	2	MATF, TUM	55	M2	M13
WP3	Choosing connecting components	RTD	1	MATF, DI	3	M4	M7
WP4	Building laptop model	RTD	3	DI	24	M7	M19
WP5	Testing the project	RTD	1	I	12	M19	M21
	TOTAL				138		

[1] Workpackage number: WP 1 – WP n.

Table 1.3b: Template - Deliverables List

List of Deliverables

Del. no. [2]	**Deliverable name**	**WP no.**	**Nature**[3]	**Dissemi -nation level** [4]	**Delivery date**[5]
D0.1	Cooperation agreement signed	WP0	R	PP	M1
D0.2	Record from every administrative meeting	WP0	R	PP	M1, M5, M10, M15, M20
D0.3	Project Handbook and Management Plan	WP0	R	PP	M2
D0.4	Periodical report	WP0	R	PP	M3, M6, M9, M12, M15, M18
D0.5	Final report at the end of the project	WP0	R	PP	M21
D1.1	Analysing smartphone market	WP1	R	RE	M1
D1.2	Analysing smartphones operating systems and development of application for that operating system	WP1	R	RE	M2
D1.3	Smartphones operating system selection	WP1	R	RE	M2
D2.1	Application analysis	WP2	R	RE	M3
D2.2	Application architecture	WP2	R	RE	M4
D2.3	Applications user interface	WP2	R	RE	M5
D2.4	First application prototype	WP2	P	RE	M7
D2.5	First application release	WP2	P	RE	M9
D2.6	Second application release	WP2	P	RE	M11

[2] Deliverable numbers in order of delivery dates. Please use the numbering convention <WP number>.<number of deliverable within that WP>. For example, deliverable 4.2 would be the second deliverable from work package 4.

[3] Please indicate the nature of the deliverable using one of the following codes:
R = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

[4] Please indicate the dissemination level using one of the following codes:
PU = Public
PP = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).

[5] Measured in months from the project start date (month 1).

D2.7	Third application release	WP2	P	RE	M13
D3.1	Smartphones connection analysis	WP3	R	RE	M5
D3.2	Proposed smartphone connection	WP3	R	RE	M6
D4.1	Hardware components analysis	WP4	R	RE	M8
D4.2	Hardware components selection	WP4	R	RE	M9
D4.3	First laptop model prototype	WP4	P	RE	M11
D4.4	First laptop model release	WP4	P	RE	M13
D4.5	Laptop model second release	WP4	P	RE	M15
D4.6	Laptop model third release	WP4	P	RE	M18
D5.1	User interface tests analysis report	WP5	R	RE	M19
D5.2	Performance tests analysis report	WP5	R	RE	M20
D5.3	Stablility tests analysis report	WP5	R	RE	M21

Table 1.3c Template - List of milestones

Milestones

Milestone number	Milestone name	Work package(s) involved	Expected date [6]	Means of verification[7]
M0.1	Entry meeting	WP0	M1	Meeting - introduction
M0.2	Signing of the contract	WP1	M1	Meeting - signing of the contract
M0.3	End of the project	WP5	M21	Delivery of the product
M1.1	Smartphone market anasysis	WP1	M1	Report about smartphone market and number of users
M1.2	Smartphone operating system development analysis	WP1	M2	Report about Smartphone operating system development
M1.3	Smartphone operating system selected	WP1	M2	Report about choosen smartphones operating system
M2.1	Application analysis	WP2	M3	Detail report about application analysis and demands
M2.2	Application architecture	WP2	M4	Detail documentation about application architecture, its interfaces and modules
M2.3	Application user interface	WP2	M5	Detail documentation about user interface design
M2.4	Application prototype	WP2	M7	Detail documentation about application prototype
M2.5	Application release	WP2	M13	Detail documentation about the released application
M3.1	Smartphone connection	WP3	M6	Detail documentation about selected smartphone connection and its characteristics
M4.1	Hardware	WP4	M9	Detail documentation

[6] Measured in months from the project start date (month 1).
[7] Show how you will confirm that the milestone has been attained. Refer to indicators if appropriate. For example: a laboratory prototype completed and running flawlessly; software released and validated by a user group; field survey complete and data quality validated.

	components			about hardware complements and its characteristics
M4.2	Laptop model prototype	WP4	M11	Detail documentation about the product
M4.3	Laptop model release	WP4	M18	Detail documentation about the product
M4.4	Project - final version	WP4	M18	Detail documentation about the product
M5.1	Testing	WP5	M21	Documentation about testing ot the product and testing results

Table 1.3d: Template - Work package description

Work package description

Work package number	0	**Start date or starting event:**	M1			
Work package title	Project management					
Activity type[8]	MGT					
Participant number	1	2	3				
Participant short name	MATF	TUM	S				
Person-months per participant	10	10	22				

Objectives

Ensuring the overall, scientific, educational and technical coordination of the project.

Ensuring co-operation and coordination with competent state authorities in relation to

research programs.

Ensuring progress in project development.

Description of work

T1- (S): Consortium management

T2- (S): Risk management

T3- (TUM): Change management

T4- (MATF): Quality control management

Deliverables

Cooperation Agreement (M1)

Reports from each administrative meeting (M1, M5, M10, M15, M20)

Project Handbook and Management Plan (M1)

Periodic Reports (M3, M6, M9, M12, M15, M18)

Final report at the end of the project (M21)

Target product (M21)

[8] Please indicate one activity per work package:
RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

Work package number	1		**Start date or starting event:**		M1		
Work package title	Choosing type of smartphone operating system						
Activity type[9]	RDT						
Participant number	1	1					
Participant short name	MATF	TUM					
Person-months per participant	1	1					

Objectives

Making detailed analysis to ensure that the best smartphone operating system has been selected

Description of work

T1 - (MATF): Smartphone market anasysis

T1 - (MATF): Smartphone operating system development analysis

T1 - (TUM): Smartphone operating system selected

Deliverables

Analysing smartphone market (M1)

Analysing smartphones operating systems and development of application for that operating system (M2)

Smartphones operating system selection (M2)

Work package number	2		**Start date or starting event:**		M2		
Work package title	Smartphone application implementation						
Activity type[10]	RTD						
Participant number	3	2					
Participant short name	MATF	TUM					
Person-months per participant	11	11					

Objectives

Designing applications architecture and user interface

Implementing application according to architecture and user interface design

[9] Please indicate one activity per work package:
RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

[10] Please indicate one activity per work package:
RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

Description of work

T1 - (MATF): Analysing and proposing applications architecture

T1 - (TUM): Analysing and proposing applications user interfaces

T1 - (MATF): Implementing application

Deliverables

Architecture proposal (M4)

User interface proposal (M5)

Application prototype (M7)

Application release (M13)

Work package number	3	**Start date or starting event:**	M5			
Work package title	Choosing connecting components					
Activity type[11]	RTD					
Participant number	1	1					
Participant short name	MATF	DI					
Person-months per participant	2	1					

Objectives

Make detailed analysis about different types of connecting components and the way they can be implemented

Description of work

T1 - (MATF): Make detailed analysis about smartphone connection

T1 - (DI): Propose smartphone and laptop model connection

Deliverables

Smartphones connection analysis (M5)

Proposed smartphone connection (M6)

[11] Please indicate one activity per work package:
RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

Work package number	4	**Start date or starting event:**	M7				
Work package title	Building laptop model						
Activity type[12]	RTD						
Participant number	2						
Participant short name	DI						
Person-months per participant	12						

Objectives

Perform detailed analysis of hardware components and select appropriate components to make laptop model prototpe.

Description of work

T1 - (DI): Analyse hardware components

T2 - (DI): Select appropriate hardware components

T3 - (DI): Build laptop model from selected hardware components

Deliverables

Smartphones connection analysis (M8)

Hardware components selection (M9)

Make laptop prototype (M11)

Make laptop model (M18)

Work package number	5	**Start date or starting event:**	M19				
Work package title	Testing the project						
Activity type[13]	RTD						
Participant number	3						
Participant short name	S						
Person-months per participant	3						

Objectives

[12] Please indicate one activity per work package:
RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

[13] Please indicate one activity per work package:
RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

Perform tests on application and laptop model

Description of work
T1 - (S): Test user interface and make report out of testing data and results
T2 - (S): Test applications perofrmance and make report out of testing data and results
T3 - (S): Test applications stability and make report out of testing data and results

Deliverables
User interface tests analysis report (M19)
Performance tests analysis report (M20)
Stablility tests analysis report (M21)

Table 1.3e Summary of effort

Summary of effort

A summary of the effort is useful for the evaluators. Please indicate in the table number of person months over the whole duration of the planned work, for each work package by each participant. Identify the work-package leader for each WP by showing the relevant person-month figure **in bold**.

Partic. no.	**Partic. short name**	**WP0**	**WP1**	**WP2**	**WP3**	**WP4**	**WP5**	**Total person months**
1	MATF	10	1	33	2			46
2	TUM	10	1	22				36
3	DI				1	12		15
4	I	22						22
5	S						9	9
Total		42	2	55	3	12	9	119

Section 2. Implementation

2.1 Management structure and procedures

As a large number of people work on the project, project success depends to a great extent on their mutual communication and coordination. For these reasons, they will insist on communication, and each partner will have a representative in the team of their partners Project management will be managed in accordance with Scrum methods.

The goals will be defined on a daily basis at short "fifteen-minute" long meetings (Skype and directly).

The basic questions to be asked at the meetings will be:

1. What was done yesterday?
2. What will be done today?
3. What kind of obstacles do we expect?

The iterative cycle in the process lasts 30 days. During this time, progress will be monitored and risky places for further promotion. Monitoring the progress and direction of the project will be dealt with by the Steering Committee and each the partner will have one representative in the committee. Also, each of the partners in the project has its Scrum Masters who is responsible for the fact that his team functions according to the Scrum methodology. Scrum Master organizes his team and represents the main link with other partners.

2.2 Individual participants

The Faculty of Mathematics - MATF

The Faculty of Mathematics is higher education institution that has existed as an independent since 1995.

Over the past years, the curriculum and curriculum of the faculty has been intensively changed, with the goalmore efficient and up-to-date study programs, in line with modern high-level trendseducation. Over 6000 graduated mathematicians, over 700 magicians, numerous specialists and over 400 doctors of science are the indicators of the quality of the Faculty of Mathematics the most recognizable, and from the ranks of the teachers of this faculty, ten members of Serbian were chosen so farAcademy of Sciences and Arts.

The Department of Computing and Informatics of the Faculty of Mathematics prides itself on its current andformer students. Graduated students of this department are working in leading IT departmentscompanies (and other companies with IT departments) in Serbia, some work inlarge companies overseas, some are at postgraduate studies at leadinguniversities, and some of the best work as assistants and teachers at the University of Belgrade

Technical University of Munich, Department of Informatics - TUM

The Department of Informatics is one of the largest and most renowned informatics departments in Germany and our professors and teaching staff are experts in their respective fields. Students of our master's programs receive a top-level education and can tailor their program to focus in depth on the topics that interest them most.

Dragon Innovation - DI

Dragon Innovation works with entrepreneurs to launch hardware products and scale companies. Founded by a team of hardware experts, Dragon provides a clear path from prototype through production with unmatched manufacturing expertise. Dragon customers include Zuli, Petnet, Jibo, Pebble, Coolest, MakerBot, LIFX, Orbotix, Insensi, FormLabs, and over 100 additional companies paving the road for how new technology gets made. Following is a sampling of success stories.

Infectra - I

Inflectra is a privately held software company dedicated to helping our customers - large corporations, small businesses, professional services firms, government agencies and individual developers – with the means to effectively and affordably manage their software development lifecycles, so as to decrease the time to market and increase return on investment.

Sixsentix - S

Sixsentix is a leading provider of Software Testing Services, Visual Analytics and Reporting, helping enterprises to accelerate their Software Delivery. Our unique risk-based Testing and QACube ALM Reporting and Dashboards, provide business with unprecedented quality and transparency across Software Delivery projects for a faster time-to-market.

2.3 Consortium as a whole

The consortium consists of institutes and universities that are known for their excellent work in their own areas of research. Consortium members have the appropriate knowledge and skills necessary for the successful implementation of the ULD project. They have numerous projects and experience behind them which enables them to better understand the dimensions of problems and solutions. They are open for cooperation, which is of great importance for a project of such large size.

i) Sub-contracting:

TUM, Germany
DI, USA

ii) Other countries:

MATF, Serbia

2.4 Resources to be committed

The consortium is made by the most skilled people in this field of research, and is believed to have great looks to the successful implementation of the project. The knowledge they possess and share with each other in this project has enormous conditions and we consider that people are the most important resource of this project.

Financial Plan:

- It is necessary to provide the best resources for the development of such a project. A large part of the money will be spent on buying all the necessary parts.
- All participants in the project need to payed for their work for which a certain amount of money will be spent.
- It is necessary to allocate a part of travel money that will be organized in order to successfully develop a project with the aim of better coordination. Since travel funds at this moment are difficult to assess the proposal is to allocate E100K (In case of part money spent on travel does not spend until the end of the project would be returned).

Section 3. Impact

3.1 Expected impacts listed in the work programme

The ULD project would improve the way in which we use our smartphones. You are no longer restricted to small displays and limited interfaces. With an increase in smartphone cpu capabilites range of avaliable usage in ULD project will grow. There will be no more need to carry around heavy laptop.

Section 4. Ethical Issues

ETHICAL ISSUES TABLE

	YES	PAGE
Informed Consent		
• Does the proposal involve children?	NO	
• Does the proposal involve patients or persons not able to give consent?	NO	
• Does the proposal involve adult healthy volunteers?	NO	
• Does the proposal involve Human Genetic Material?	NO	
• Does the proposal involve Human biological samples?	NO	
• Does the proposal involve Human data collection?	NO	
Research on Human embryo/foetus		
• Does the proposal involve Human Embryos?	NO	
• Does the proposal involve Human Foetal Tissue / Cells?	NO	
• Does the proposal involve Human Embryonic Stem Cells?	NO	
Privacy		
• Does the proposal involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)	NO	
• Does the proposal involve tracking the location or observation of people?	NO	
Research on Animals		
• Does the proposal involve research on animals?	NO	
• Are those animals transgenic small laboratory animals?	NO	
• Are those animals transgenic farm animals?	NO	
• Are those animals cloned farm animals?	NO	
• Are those animals non-human primates?	NO	
Research Involving Developing Countries		
• Use of local resources (genetic, animal, plant etc)	NO	
• Impact on local community	NO	
Dual Use		
• Research having direct military application	NO	
• Research having the potential for terrorist abuse	NO	
ICT Implants		
• Does the proposal involve clinical trials of ICT implants?	NO	
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	YES	