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

Proposal full title:

Development of an application used by local health centres for call for blood donors

Proposal acronym:
DonorAlert

Small or medium scale focused research project (STREP)
Date of preparation: 2020-01-10
Version number : 1.0

Work programme topic addressed
SU-DRS02-2018-2019-2020

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Participant no. *	Participant organisation name	Part. short name	Country
1 (Coordinator)	Faculty of Mathematics, University of Belgrade, Serbia http://www.matf.bg.ac.rs/	MATF	Serbia
2	Information Technologies DM	ITDM	Serbia
3	Red cross of Serbia	RCS	Serbia

Proposal abstract

In Serbia, blood donation system is not very widespread. The main causes of that are mostly lack of information. People are aware that they can donate blood in every hospital and medical centre, but in our country medical services are slow, unorganized and people don't have trust in them. Main purpose of developing an application which connects medical centres and blood donors and people who would like to become donors, lays in overcoming listed problems and raising awareness that your 5 minutes are someone's whole life, as one of the commercial says. Also, the application can be used for educating people about the procedure of blood transfusion and its effect on organism for both donors and people who receives blood. The main feature of the application is that you get notification when the donated blood is used, and that you really matter in this process.

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Proposal

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

1.1   Concept and objectives

The major concept behind this proposal is to connect synergistically the following fields:
(MDS) medical diagnostic systems, ECE (electrical and computer engineering), INT (Internet technology), SEM (software engineering methodology).

This major strategy is mostly compatible with major goals expressed in Call 35806 (https://eucalls.net/dashboard/call?id=35806).

To stress the compatibility and competitiveness of our approach, we paraphrase here the essential points of Call 35806: Development of innovative tools, methodologies and European pre-hospital guidelines for first responders of medical services, fire services and police and hospital trauma teams in order to ensure faster and more effective evaluation and control of numerous seriously injured casualties in disaster and/or emergency situations.

In Serbia blood donation system is not very widespread. The main causes of that are mostly lack of information and time. People are aware that they can donate blood in every hospital and medical centre, but in our country medical services are slow, unorganized and people don't have trust in them. Busy life, slow traffic and waiting in lines are average Serbian everyday life. Adding another point in this circle is not very appealing. Red Cross of Serbia is doing their best with spreading the word about the importance and necessity of being blood donor, but in practise, the numbers are not very good. There are people who donate regularly, but the most people donate when is urgent for the people they know or are related to. People in need for blood, often ask for help on social media, which is fast but not perfect system for the long run.

Main purpose of developing an application which connects medical centres and blood donors and people who would like to become donors, lays in overcoming listed problems and raising awareness that your 5 minutes could actually save lives. Also, the application can be used for educating people about the procedure of blood transfusion and its effect on organism for both donors and people who receives blood. The main feature of the application is that you get notification when the donated blood is used, and that you really matter in this process. The app will track all donations and send reminders when the time for next donation comes.

Blood donors get 3 days off work for every transfusion, which is very meaningful in these hectic days, but people are unaware of that because often employers are hiding that information or refuse to give to the employee days off. Data from DonorAlert could help the Ministries of Health and Labour, Employment and Social Affairs for tracking the donors and their payments and days off.

Application will be published as Android and iPhone Mobile App, written in Java Swift technology for developing mobile apps and MongoDB database.

Two main entities are blood donors and health centres. Every potential blood donor can download an app, enter his basic data (blood type, age, gender).

For every health centre in Serbia, profile will be open, and access to it will be granted by MATF. When blood supplies are low, administrator who had access to AlertDonor profile of his centre, raises an Alert for blood donors for blood type in deficit. All blood donors in area of the health centre gets notification – call for action.

After donating blood, team who perform transfusion must confirm that user donated blood, and application will mute for next 3 months for man, and 4 months for women.

When blood is used, donor will be notified and thanked for their help.

1.2   Progress beyond the state-of-the-art

The existing state-of-the-art are apps which provide info about the near hospital centres. Provided solution is technically and ideologically upgrade on existing projects. Advance of proposed project lays in power to call for immediate action wind range of people who are in database. Also, donor will be notified when his transfusion is used which gives donors real feel that their service helped and really matter.

1.3   S/T methodology and associated work plan

1.3.1   Describe the overall strategy of the work plan

Work plan will be described in agile software development methodology. Work will be divided into sprints (work packages) – each process entity will be one work package. After finishing development of one entity, sprint is over and app is headed to the test management for user acceptance test. In every sprint, bugs from previous sprint needs to be fixed, and planed development must be finished.

The project is organized in 7 work packages as follows:

- WP0 Concept development and planning
- WP1 Requirements analysis
- WP2 Design
  Implementation phase:
- WP3 Database design, Implementing basic functionalities – gui, developing user management system (admin and donor types of users)
- WP4 Development of admin user rights and actions – creating alarms for low blood type supplies
- WP5 Development of donor user rights and actions – creating alarms for new donations
- WP6 Development of form for entering data about used blood by admin and notification for donor user

1.3.2   Show the timing of the different WPs and their components (Gantt chart or similar).
iii)   Provide a detailed work description broken down into work packages:
- Work package list (please use table 1.3a);
- Deliverables list (please use table 1.3b);
- List of milestones (please use table 1.3c)
- Description of each work package (please use table 1.3d)
- Summary effort table (1.3e)
iv)   Provide a graphical presentation of the components showing their interdependencies (Pert diagram or similar)
v)   Describe any significant risks, and associated contingency plans

Table 1.3a: Template - Work package list

Work package list

Work package No[1]	Work package title	Type of activity[2]	Lead partic no.[3]	Lead partic. short name	Person-months[4]	Start month[5]	End month[5]
WP0	Concept development and project management	RTD	3	MATF, ITDM,RCS	0.5	April 2020	April 2020
WP1	Requirements analysis	RTD	3	MATF, ITDM,RCS	0.5	April 2020	May 2020
WP2	Design	RTD	2	MATF, ITDM	0.5	May 2020	May 2020
WP3	DB & start	RTD	2	MATF, ITDM	1	May 2020	June 2020
WP4	Admin user profile	RTD	3	MATF, ITDM,RCS	1	June 2020	July 2020
WP5	Donor user profile	RTD	3	MATF, ITDM,RCS	1	July 2020	Aug 2020
WP6	Post alerts	RTD	3	MATF, ITDM,RCS	1	Aug 2020	Sep 2020

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[1]   Workpackage number: WP 1 – WP n.
[2]   Please indicate <u>one</u> activity per work package:
        RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium
[3]   Number of the participant leading the work in this work package.
[4]   The total number of person-months allocated to each work package.
[5]   Measured in months from the project start date (month 1).

Table 1.3b: Template - Deliverables List

List of Deliverables

Del. no.[6]	Deliverable name	WP no.	Nature[7]	Dissemi -nation level [8]	Delivery date[9] (proj. month)
0.1	Detail analysis of requirements	0	P	PP	M1
0.2	Decision making details	0	P	CO	M1
0.3	Schematics	0	P	CO	M1
0.4	Proposal for product development	0	R	PU	M1
0.5	Time and resource management	0	R	PP	M1
1.1	Procedure details	1	R	PU	M1
2.1	Designing phase	2	R	CO	M2
2.2	Database scheme	2	R	CO	M2
2.3	Algorithmic details	2	R	PU	M2
3.1	Setting up database	3	R	CO	M2
3.2	Setting up Android app	3	R	CO	M2
3.3	Setting up iPhone app	3	R	CO	M2
3.4	Creating basic user interface	3	R	CO	M3
3.5	Developing user management and profiles	3	R	CO	M3
3.6	Testing	3	R	PU	M3
4.1	Developing of all admin user rights	4	R	CO	M34

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[6]   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.

[7]   Please indicate the nature of the deliverable using one of the following codes:

R = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

[8]   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).

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

4.2	Documentation	4	R	PU	M4
4.3	Testing	4	R	PU	M4
5.1	Developing of all donor user rights	5	R	CO	M45
5.2	Documentation	5	R	PU	M5
5.3	Testing	5	R	PU	M5
6.1	Developing form for entering data about blood transfusion	6	R	CO	M56
6.2	Documentation	6	R	PU	M6
6.3	Testing	6	R	PU	M6

Table 1.3c Template - List of milestones

Milestones

Milestones are control points where decisions are needed with regard to the next stage of the project. For example, a milestone may occur when a major result has been achieved, if its successful attainment is a required for the next phase of work. Another example would be a point when the consortium must decide which of several technologies to adopt for further development.

Milestone number	Milestone name	Work package(s) involved	Expected date [10]	Means of verification[11]
M0.1	Checking on optimization of the processes involved in the project (deadlines)	WP0	M12	
M0.2	Checking the estimation of time and resource pools	WP0	M1	
M2.1	Checking on SW and HW architecture which permits easy expandability	WP2	M2	
M4.1	Checking timely implementation	WP4	M3	software released and validated by a user group
M4.2	Checking implementation without bugs	WP4	M4	software released and validated by a user group
M5.1	Checking timely implementation	WP5	M4	software released and validated by a user group
M5.2	Checking implementation without bugs	WP5	M5	software released and validated by a user group
M6.1	Checking on test cases	WP6	M6	

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

[11] 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.

	developed according to the needs of the beneficiary industry			
M6.1	Checking on details of the requirements for industrial prototype to follow.	WP6	M7	software released and validated by a user group

Table 1.3d: Template - Work package description

Work package description

Work package number	0		Start date or starting event:	Beginning of M1			
Work package title	Concept development and project management						
Activity type[12]	RTD						
Participant number	3						
Participant short name	MATF	ITDM	RCS				
Person-months per participant	0.5	0.5	0.5				

Objectives

The objectives of WP0 are the overall management, progress monitoring and stakeholders management of the project.

WP0 aims at:

Setting up, operating and maintaining the project administrative and scientific management infrastructure.

Ensuring the overall scientific and technical coordination of the project.

Performing a self-assessment of the project progress.

Complete understanding of requirements

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Project management plan (MATF, RCS)
- Detail analysis of requirements (MATF, ITDM,RCS)
- Decision making details (MATF, ITDM)
- Schematics (MATF, ITDM)
- Proposal for product development (MATF, ITDM)
- Time and resource management (MATF, RCS)

Deliverables (brief description) and month of delivery (end in M1)

- Progress reports
- Proposal for product development

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[12] 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:			Second half of M1		
Work package title	Requirements analysis							
Activity type[13]	RTD							
Participant number	3							
Participant short name	MATF	ITDM	RCS					
Person-months per participant	0.5	0.5	0.5					

Objectives

The objectives of WP1 are the requirement analysis and feasibility study

WP1 aims are:

- Overall understanding of the RCS requirements

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Analysis (MATF, ITDM)
- Briefing (MATF, ITDM,RCS)

Deliverables (brief description) and month of delivery (end in M1)

- Report with requirements and possible actions and feasibility study

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

Work package number	2		**Start date or starting event:**		Beginning of M2			
Work package title	Design							
Activity type[14]	RTD							
Participant number	2							
Participant short name	MATF	ITDM						
Person-months per participant	0.5	0.5						

Objectives

The objectives of WP2 is design study.

WP2 aims are:

- Schematics of overall project

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Designing phase (MATF, ITDM)

- Database scheme (MATF, ITDM)

- Algorithmic details (MATF, ITDM)

Deliverables (brief description) and month of delivery

Report with design details (end in M2)

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

Work package number	3		**Start date or starting event:**		Second half of M2		
Work package title	DB & init App						
Activity type[15]	RTD						
Participant number	3						
Participant short name	MATF	ITDM	RCS				
Person-months per participant	1	1	1				

Objectives

The objectives of WP3 is basic development.

WP3 aims are:

- To setup DB

- To setup environment for developing phase

- To create initial basic apps

- To create user management system and profiles

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Setting up database (MATF, ITDM)

- Setting up Android app (MATF)

- Setting up iPhone app (ITDM)

- Creating basic user interface (MATF, ITDM)

- Developing user management and profiles (MATF, ITDM)

- Testing (RCS)

Deliverables (brief description) and month of delivery (end in M3)

- Initial version of application

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[15] Please indicate <u>one</u> 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:		Second half of M3		
Work package title	Admin user rights and actions						
Activity type[16]	RTD						
Participant number	3						
Participant short name	MATF	ITDM	RCS				
Person-months per participant	1	1	1				

Objectives

The objectives of WP4 are development of admin user rights and actions – creating alarms for low blood type supplies. Admin in this section is administrator for local health centre who will initiate and stop calls for donors.

WP4 aims are:

- Functional page for admin user

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Developing of all admin user rights (MATF, ITDM)
- Documentation (MATF, ITDM)
- Testing (RC)

Deliverables (brief description) and month of delivery

- Functional version of application for admin users (end in M4)

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

4ork package number	5		**Start date or starting event:**		Second half of M4		
Work package title	Donor user rights and actions						
Activity type[17]	RTD						
Participant number	3						
Participant short name	MATF	ITDM	RCS				
Person-months per participant	1	1	1				

Objectives

The objectives of WP5 are development of donor user rights and actions – creating profile with input of all data – blood type, gender, age, accepting/declining of collecting data in health research purposes, and marking opening for donations.

WP5 aims are:

- Functional page for donor user

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Developing of all donor user rights (MATF, ITDM)

- Documentation (MATF, ITDM)

- Testing (RCS)

Deliverables (brief description) and month of delivery

- Functional version of application (end in M5)

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[17] Please indicate <u>one</u> activity per work package:

RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

Work package number	6		**Start date or starting event:**		Second half of M5		
Work package title	Donor user rights and actions						
Activity type[18]	RTD						
Participant number	3						
Participant short name	MATF	ITDM	RCS				
Person-months per participant	1	1	1				

Objectives

The objectives of WP6 are development of form for entering data about used blood by admin and notification for donor user.

WP6 aims are:

- To connect user with its donation and notifying donor about usage of blood supply

Description of work (possibly broken down into tasks) and role of partners

WP Leader: MATF

Tasks:

- Developing form for entering data about blood transfusion (MATF, ITDM)

- Documentation (MATF, ITDM)

- Testing (RCS)

Deliverables (brief description) and month of delivery

- Functional version of application (end in M6)

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[18] Please indicate <u>one</u> activity per work package:

RTD = Research and technological development; DEM = Demonstration; MGT = Management of the consortium.

Table 1.3e   Summary of effort

Summary of effort

Partic. no.	Partic. short name	WP0	WP1	WP2	WP3	WP4	WP5	WP6	Total person months
1	**MATF**	0.5	0.5	0.5	1	1	1	1	5.5
2	**RC**	0.5	0	0	0	0.5	0.5	0.5	2
3	**DJM**	0.5	0.5	0.5	1	1	1	1	5.5
etc									
Total		0.5	1	1	2	2.5	2.5	2.5	13

Section 2.   Implementation

2.1   Management structure and procedures

The project involves several partners with intention to provide support for multiple activities involving development and testing. Therefore, coordination and management of the project are of crucial importance. The basic project management approach for the project is to have a scientific coordinator focus on the technology and development and to have an administrative coordinator handle the overall operational and day-to-day business and communication between partners. A clearly defined project management structure will be set up, including precise management processes and decision rules. This will ensure that the project meets its objectives and delivers the results in time and with high quality. The project operational steering board will be established to monitor the progress and direction of the project. Each partner will have one board member.

OSG -> Jana -> Djordje -> red cross tm

Project manager – Jana
Overall co-ordination of the project execution and inter-partner co-operation
Maintenance of project plan
Risk analysis and mitigation
Chairing the project meetings

Scientific coordinator – Djordje

The S&T manager will have the overall responsibility for the scientific and technical direction of the project and will report to the project manager. The S&T manager will maintain a continuous liaison with all work-package leaders exchanging and evaluating meaningfully and efficiently information on project work performed and to be performed next

2.2   Individual participants

MATF
Faculty of Mathematics, University of Belgrade, Serbia is a leading university in the computer science area, and it enjoys a strong world-wide reputation. Its students are winning international competitions in fields of Mathematics and Computer Science. All study programs at all three levels of studies at the Faculty of Mathematics are regulated according to the Bologna principles. Through recently re-organized and improved studying programs, students receive challenging learning opportunities through strongly integrated classroom instruction and faculty-supervised research experiences. From the first steps on the Faculty, the students are motivated to move their boundaries of learning and knowledge. Numerous graduates occupy various positions in research institutions, government offices, companies and schools in the country and abroad. It is a quality indicator of the studies at the Faculty of Mathematics.

Jana Milutinovic is master student of Informatics on MATF. She has 3.5 years of experience in IT industry. In this project Jana will be PM and also developer for Android Application.

ITDM
ITDM is small company from Serbia, which develops mobile applications for companies all over the world. Their expertise is crucial in this project, as they will me the main carriers of the project and also have obligation to tech and mentor the students from MATF.

Djordje Milutinovic is software developer specialised in mobile app development, with 4 years of experience working on project for different clients.

Red Cross of Serbia (RCS)
The Red Cross of Serbia is a humanitarian, non-governmental organisation that provides humanitarian aid, disaster relief and education in Serbia.

2.3   Consortium as a whole

This consortium is set of various profiles of people from different backgrounds, working together fully committed to the project, in order to create product which will serve whole community.
Some of the participants have collaborated before and had great results together. Participants share different kinds of expertise in their fields and a sense of commitment to a greater cause. This combination of different groups with their knowledge and motivation will be utilised and organised in order to complete this project successfully. Both academic and industry oriented views of the problems ensures stability and sustainability to the project.

If necessary, sub-contracting and engagement of experts will be done, but less likely. Participants have more than enough experience and expertise in proposed technologies. Budget for this comes from the S&T coordinator's budget.

2.4   Resources to be committed

Mobilization of resources

The resources needed for the project activities are integrated from one academic organization, one non-governmental organization and one industrial partner. The resources profile and the participating partners are complementary in many respects with their expertise at first and the sense for doing the right thing on projects that rally matter. Participating partners will be working separate and together, based on project phase, with everyday progress monitoring and sharing thoughts. In development phase, joined meetings will be organised once a week in development phase.

Acquisition of new resources
The resources needed for AlertDonor implementation and testing in the widest sense are difficult to
estimate precisely at this point, and the suggestion is that they be allocated on the level of E20K (and extra money returned, if not used).

Financial plan
The Consortium has pulled together total of 16 man months of which 18% is allocated to post development support activities. The total estimated budget for the project is about 105.000,00 Euro.

Section 3.   Impact

3.1   Expected impacts listed in the work programme

AlertDonor will be unique, easy maintained, easy to use application. After developing this app, the expected number of blood donors will be increased by magnificent 145%. In mobile phones millennium, importance of technology must be used for the topics that are important globally. Call for donor actions will be easier than ever, in just one minute, all users of app will be notified for the urgency of donating in nearest area. Impact on people's lives is enormous and its contribution will be noticeable immediately after release, with good marketing.

As mentioned in this paper before about Serbian health system, European engagement is crucial as part of Non-Eu countries development and battle with corruption.

AlertDonor data can are valuable for both national and international researches in field of health and blood transfusion.

3.2   Dissemination and/or exploitation of project results, and management of intellectual property

Addition to the proposed project includes implementing calls for other types of needs like thrombocytes, skin transplantations, etc. Impact on science and research will be extended by information of these kind of donations and its donors.

Good marketing is important after the development and release phases of the project. Interest groups are people between 18 and 65 years old, with good health, who weighs more than 50kg, and don't have problems with anaemia.

Section 4.   Ethical Issues

The proposed project does not directly involve any ethical, legal, social or safety issues. Due to the nature of this project however, in an indirect way, the consortium will also have to deal with ethical, legal, social and safety issues relating to the research projects assisted and coached as consequence of the work foreseen in this proposal.

However, since the personal health data are being used, every user will chose if their data can be collected in research purposes. User must enter his gender, blood type and age and app needs to have permission to the user location. Privacy and personal identity is guaranteed, since user don't have to enter his full name.

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?	YES	
• Does the proposal involve Human Genetic Material?	NO	
• Does the proposal involve Human biological samples?	NO	
• Does the proposal involve Human data collection?	YES	
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)	YES	
• Does the proposal involve tracking the location or observation of people?	YES	
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	YES	
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	