Open Call Topic Proposal

SHORT TOPIC NAME
Crop planting and renewal

1 - SPECIFIC CHALLENGE

1.1 Problem and business need

Describe the challenge from a user point of view to be addressed by engaging external SMEs for a 6-month period.
Max 600 words

Many farms are facing the need of changing crops due to the financial situation created by the recent agreements reached between the EU and third countries (South Africa re orange grow, etc). In some cases, the products imported from third countries are sold in the market below the cost price that the farms claim to have making that they are not productive any longer. This situation has been recently reported by orange farms and plantations in Valencia region (Spain), but it may well affect other crops and regions as long as the EU policy is deployed with other countries.

As such, the need for alternative crops is a reality and the change culture has also reached this very stable domain. The challenge lays on the fact that since farms have been used to grow one major crop (e.g. oranges) now it's overwhelming for the farmers to think and to react to plant the right crop for the right region and right investment. Needless to say that some farms are still on old methodologies and they have not moved into the IOT world. In such cases, the most advanced technology is usually an irrigation programmer that opens and closes electro-valves connecting irrigation hoses following a schedule.

However, planting alternative crops is not an easy task and the most difficult step is to decide which crop has the best characteristics to be planted. This decision has to be influenced by the following factors:

- Farm characteristics, including factors like extension, shape, layout, terrain, accessibility
- Soil characteristics
- Weather incidence
- Crops, including factors like purchasing cost, growing time until 100% productivity, pesticides, and fertilizers
- Market forecasting, including factors like historic selling amount, projections, market acceptance
- Risk, e.g. traditional crops (e.g. pears, apples, oranges, apricots…) vs trendy crops (e.g. avocados, passion fruits…)
- Technology cost

1.2 Interoperability challenge

Identify and describe which systems need to be made interoperable and by which solutions
Max 600 words

For this topic several systems are proposed to be “contacted” for extracting the information (weather, “crops reference DB”, market forecasting…). Since these systems are expected to be external to the farm ETL routines might be needed for injecting the data from those repositories into the DEMETER DSS. As such, the interoperability should be guaranteed by means of DEMETER Enablers.

2 - TOPIC JUSTIFICATION

Why is that type of solution important to the DEMETER's ecosystem?
Map the topic to the DEMETER project objectives.
Max 300 words

DEMETER aims to provide the means to the farmers and related organisations to make informed decisions. However, DEMETER has only focused on needs from farms which will be keeping growing the same crops and has not included in their scenarios the needs for those farms that want to, or are forced to, change their business crop and switch to another one.

In addition, functionalities covering benchmarking are in the development pipeline for the DEMETER DSS, however nothing has been planned to develop financial assessment and help the farmers in making this key decision which will change the farmer way of life and experience in growing different crops. It is a complementary DSS functionality in DEMETER platform.

3 - TOPIC REQUIREMENTS

Identify, if necessary, the requirements that need to be met by the solution or SME in order to ensure the interoperability of the SME solution into Demeter's platform.
(E.g. Technology readiness level needed, use of open source, open standards, use of specific programming language, ethics requirements, security requirements, geographical requirements, data management requirements, intellectual property rights requirements, etc...)

Requirement type	Requirement description	Motivation
Technology readiness level	TRL5-6	The developed module should be demoed in, at least, one pilot TRL5-6
Source code availability (Open source, etc…)	Open-source solutions will be useful	DEMETER GitLab should be used for storing the source code of the proposed solution
Standards (Open standards, etc...)	REST interface	Usage of REST interfaces should be sought to ensure the integration of

		the module with the rest of DEMETER DSS
Programming language	Java, Python	
Ethics	Permissions to access to data from farms is needed upon request	Data coming from the farms belongs to the farms. So bilateral agreements should be sought
Security	N/A	N/A
Geographical	Valencia region	Although it can apply to several EU regions
Data management	Any proprietary data coming from the farm(s) will belong to the farm(s) and will follow the disclosing and sharing guidelines from the farm(s). Any output data from the development will belong to both the farm(s), DEMETER, and the developer. The Data Manager will be the main contact from DEMETER who will guarantee the transparency and prevent any misuse of the data by either the farm(s) or the developer. Other considerations: - Version control and backup: Access to the DEMETER GIT and to the NextCloud shall be provided to support this action. - Security and data protection: DEMETER responsible will act as mediator between both parties to ensure this action comes to a success.	
Intellectual property rights	Results will belong to developers, farmers, and DEMETER	
Other(s)	Use of centralised DBs where the information about crop growing and productivity are contained, market trends analysis	

4 - DELIVERABLES The supported SMEs will be engaged with DEMETER for a 6-month period of time, divided by three sprints of two months. At the end of each sprint, there will be an evaluation process based on deliverables. What type of deliverable should be submitted by the SME at the end of each sprint? (E.g. Presentation; feasibility test, operational test, integration test, deployment test, training session, ...) Max 300 words
1st Sprint (M2) Presentation + feasibility test 2nd Sprint (M4) Operational test 3rd Sprint (M6) Operational test + deployment test + training session + present results to farmers

5 - EVALUATION Who, within DEMETER, should evaluate the submitted deliverables?
WP4 leads

6 - RESOURCES PROVIDED BY DEMETER Describe the support activities or components that can be provided to the selected SME(s). E.g. Training, technical support, data sets, infrastructure access, in-site visit, ...	
Support Activity or Component	Within DEMETER, who provides the support or component?
Technical support to APIs connection	WP3 and WP4 will offer support in connecting the solution to the different enablers (WP3) and the DSS (WP4)
In-site visit	WP4 lead can offer an in-site visit to a farm so a better idea can be obtained by the applicants

7 - EXPECTED OUTCOME Identify the expected result of the SME contribution E.g. Increased precision of ???, reduction in time of ???, Improved efficiency of ???, decreased consumption of ???, minimization of ???
The expected result would be a new DSS module ready to be integrated (or with minimal efforts) into the DEMETER DSS so that the farm(s) using DEMETER will have the possibility of financial and economic viability to decide whether to change the crops. The DSS module could include an UI to ease its integration and to see how easy it is to be used. The final result will be judged against how precise the economic and new crops predictions are and how satisfied are the farm(s) with the results.

8 - CONTACT	
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