



Networking Session on EU & India Clustering on IoT technologies for Smart Agriculture

Held as part of ICT 2018, Vienna, Austria
Venue: The Austria Centre Vienna (ACV) Room L1

5th December, 2018, 09:00am – 09:45am

Organised by: EU-India FI-MEDIA project¹



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Waterford Institute
of Technology - TSSG

TSSG



IIT Delhi



Beyond Evolution
Tech Solutions

¹ funded by the Delegation of the European Union to India; <http://www.bic-fimedia.eu/>



Background of networking session

The EU sponsored “EU-India FI-MEDIA project”², funded by the Delegation of the European Union to India³, is a mobility project that facilitates the building of Cluster to Cluster (C2C) Partnerships between EU and India researchers and industry around relevant topics of mutual interest within the Future Internet and Electronic Media domain. One of those topics is Smart Agriculture and how it could relate to Smart Villages. In recent months, the project has organised a successful C2C partnership workshop at ABV-IIIT&M, Gwalior⁴, during 12-13th November 2018, on the theme of “Smart Villages”.

The main takeaways of the ABV-IIIT&M, Gwalior workshop can be found in Table 1.

Table 1. Key take-aways from the C2C Smart Villages Workshop

A number of Research & Innovation topics were presented for Smart Villages
<ul style="list-style-type: none"> • Smart Village project of MeitY, Govt. of India • Food security and Food safety; • Attributes of Smart villages; • Smart Dairy, including health care of animals; • Smart crops; • Human fitness (of all age groups); • Smart transportation; • Smart irrigation; • Pesticide control; • Hygiene and cleanliness; • Fish farming; • Infant health care/tele-consultation ; • Crop insurance; • Skill Development/Capacity Building; • Incubation & Initiation of Start-ups through Venture Capital.
Identified Difficulties to address
<ul style="list-style-type: none"> • How to better reach out to the villagers to gather their needs; • Establishing of a consistent assessment of needs and procedure to follow in villages; • Consolidation of efforts required by multi-stakeholders, avoiding of silo mode activities; • Leveraging cognitive abilities of villagers in putting technology for proper usage; • Lack of appropriate power infrastructure and connectivity, internet - road, transport, hospitals, schools & colleges and professional institutions; • Lack of public information base/data base of socio-economic, cultural & demographic and Natural resources and core livelihood source of each village/Gram Panchayats Lack of last mile implementation frameworks/model/mechanism;

² <http://www.bic-fimedia.eu/>

³ https://eeas.europa.eu/delegations/india_en

⁴ Report at https://ec.europa.eu/digital-single-market/events/cf/ict2018/document.cfm?doc_id=39023



- Lack of literate and digitally literate manpower resources in the rural parts;
- Lack of dedicated budget allocation for entrepreneurial initiatives in rural belts;
- Lack of awareness of various Govt. schemes/programmes/initiatives amongst entrepreneurs in rural belts;
- Lack of interested professional and skills human resource interested in living and working in rural belts.
- Inadequate comprehension due to language barriers, hence need to evolve solutions in a localised language
- Inadequate understanding of issues on account of several reasons (such as incomplete information, not aware of recent interventions by the government/other agencies)
- Grass root innovations need to be recognised, appreciated and adapted to meet the needs and aspirations of villagers.

Identified Clusters formed towards concrete and sustainable outputs

- Creation of a “Centre of Excellence” or “Centre of Cooperation” in this important area of Smart villages with all the right stakeholders (Academic – including linkage with UBA, Industry, Gov’t, including CSC, students that have already taken up activities in helping identify and solve problems in villages, villagers (the end-users of the technologies), and potentially others);
- Food Security / Safety / Smart Dairy – e.g. WIT VirtualMilk, Gwalior Dairy farm (“Davars” , Stellaps Technologies;
- Smart Crops (with minimal human intervention) i.e. Smart greenhouse;
- Intelligent Transport Systems in the Smart village context;
- Faculty sabbaticals amongst academia to village development programmes of Government/public sector/institution;
- Students and faculty exchange programmes on the specific subject of development of rural parts of country;
- Development of a common integrative platform which will consolidate a variety of fragmented approaches existing elsewhere;
- Sharing of best practices amongst various stakeholders;
- Allocation of a budget in the form of privy purse per village focused on encouraging entrepreneurial spirit in the rural parts of the country;
- Health fitness monitoring systems for proactive healthcare;
- Smart Pesticide control;
- A synergistic combination of applied research and the evidence based solutions, which have evolved and transmitted from generations to generations;
- “Analytics for rural applications” need to be developed (This will involve human/cattle/land records etc.

With the above in mind, the networking session was designed to kick-start the recruitment of EU and India stakeholders from research, industry, citizens, villages, etc. in order to participate in joint activities to build up an EU - India Centre of Cooperation in Smart Villages, including a number of interesting topics related to Smart Agriculture.

As shown in Table 2, the agenda for the networking session was built accordingly with some interested participants in a number of different fields related to EU – India cooperation in IoT related topics for Smart Agriculture.



Table 2. Final Agenda of the Networking Session

Time	Agenda item
09:00-9:10	Opening session & Introductions
	<ul style="list-style-type: none"> • Jim CLARKE, Waterford Institute of Technology, Ireland • Filippo PIEROZZI, European Commission, DG-CONNECT INCO Unit
9:10-9:25	Opening statements from panellists
	<ul style="list-style-type: none"> • Abhishek SHARMA, Excerpts from the Workshop on "Smart Villages" at IIIT&M, Gwalior and the key takeaways and the scope of EU-India cooperation for IoT for Smart Agriculture - Present and Future; • Francois LIENARD, Schuttelaar & Partners, IoF2020 project; • Marcos ÁLVAREZ, GRADIENT, Alliance for Internet of Things Innovation; • Shyam DIWAKAR, Director, Prof. Computational Neuroscience Lab, AMRITA VISHWA VIDYAPEETHAM; • Martin SERRANO, NUI Galway, Challenges identified in the workshop in Kalaburagi, Karnataka, India; • Antoine LEBORGNE, Stellapps, Smart Dairy.
9:25-9:40	Roundtable with panellists (driven with questions)
	<ul style="list-style-type: none"> • Are there any IoT (or otherwise) applications you have or are working on that can be adapted for "Smart Agriculture"; in particular, or for smart villages in general, even those that can be adopted from "Smart City" Applications; • If so, do you have any plans, roadmap or model of sharing them with India for making Villages "Smart"? • A number of smart agriculture areas have been identified at the workshop held at IIIT&M, Gwalior, in relation to topics for setting up a Center of Cooperation in Smart Villages. Is there any of these that you would like to participate in (see table 1 above); • Do you foresee any barriers for the development of IoT solutions to enable smart agriculture solutions & improve the lives in Smart villages; • Can you recommend other stakeholders that would be interested to participate; • Have you any experience that you can share in reaching out to the farmers in your activities to gather their requirements proactively?
9:40-9:45	Closing Remarks and Next Steps



Session outcomes



The networking session was opened by **Mr. Filippo PIEROZZI**, European Commission, DG-CONNECT International Cooperation Unit, and **Mr. James CLARKE**, Waterford Institute of Technology, Ireland, and coordinator of the EU-India FI-MEDIA project, which is funded by the Delegation of the European Union to India.

In his opening statement, **Mr. PIEROZZI** warmly welcomed this EU – India networking session and the initiative it was driving dedicated to Smart Villages, and stressed how the topic of rural regeneration was stressed a number of times in the opening plenary speeches at ICT 2018. Mr. PIEROZZI stressed the importance of collaborating with countries such as India, especially in areas related to Smart Agriculture and Smart Villages, and he welcomed an initiative related to EU and India cooperation in these important topics. In his opening statement, **Mr. CLARKE** presented the expected outcomes of the sessions as the following:

1. With help of participants, brainstorm and identify mutually beneficial research & innovation topics for IoT in Agriculture for making villages “Smart”;
2. Identify a bouquet of hot Research & Innovation topics for IoT in Agriculture based on the topics identified in the recent IIIT&M Gwalior Workshop;
3. Find interested partners in EU and India to join together on IoT for Smart Agriculture / Smart Villages;
4. Move forward to establish EU – India Center of Cooperation in Smart Villages (or even bi-lateral arrangements in a short term);
5. Launch of the Center or Cooperation ideas presenting results at the m2m+IoT Forum 2018, 14-15th January, 2018, in New Delhi, during day Smart villages.

As shown right, a rich set of panellists presented their work and motivations for working with this initiative.

In photo (left – right): Shyam DIWAKAR, Abhishek SHARMA, Francois LIENARD, Martin SERRANO, Marcos ÁLVAREZ, James CLARKE (missing from photo: Antoine LEBORGNE).





Mr. Abhishek SHARMA of Beyond Evolution Tech Solutions and partner of the FI-MEDIA project presented the outcomes and the key takeaways from the Workshop on “Smart Villages” held at IIIT&M, Gwalior on 12-13th November, 2018. He then initiated discussions on some key topics for EU – India cooperation, some of which already identified, including smart dairy, smart irrigation, and highlighted some of the efforts underway already as a result of



the EU-India FI-MEDIA Cluster to Cluster partnerships. In addition, he presented potential topics for future collaborations, which could be taken up as part of a multi-stakeholder Centre of Cooperation in Digital Villages, and could benefit both EU and India stakeholders. Towards highlighting the aspects of Smart Villages and Smart Agriculture, he explained the overall picture under the titles of a) status of villages in India, relevance of Indian agriculture for the world, views and expectations of government of India viz. improvement in the growth and efficiency of agricultural produce, water, soil and energy conservation, smart agriculture and socio-economic growth of the villages. All this leading to development of Smart Villages and also reversing the youth exodus from villages.



Mr. Francois LIENARD, Schuttelaar & Partners, presented the good work of the IoF2020 (Internet of Food and Farm 2020 - <https://www.iof2020.eu/>) project, a large scale pilot project funded in Horizon 2020 that explores the potential of IoT-technologies for the European food and farming industry. IoF2020 and EU-India FI-MEDIA participated already to a panel session at the IoT Week in Geneva in 2017 and already some synergies have been highlighted together, and “the idea of cross collaboration with India research

and industry members on a Centre of Cooperation related to Digital Villages and Smart Agriculture is seen as something to certainly consider for mutual benefits”, according to Mr. LIENARD.



Mr. Marcos ÁLVAREZ, GRADIENT, presented the Alliance for Internet of Things Innovation (AloTI), which is an European IoT platform initiative, whose aim is to strengthen the dialogue and interaction among Internet of Things (IoT) players in Europe, and to contribute to the creation of a dynamic European IoT ecosystem to speed up the take up of IoT. Members of the Alliance include key IoT industrial players – large companies, successful SMEs and dynamic start-ups – as well as well-known European research centres, universities, associations and public bodies. Of course, international cooperation is important to AloTI and working with India in areas related to IoT for Agriculture would be of significant interest. In addition, Mr. ÁLVAREZ presented GRADIENT’s role in the Smart SmartAgriHubs project, which aims to build a pan-European network of Digital Innovation Hubs (DIHs) and Centres of Competence in all 28 European Member States co-ordinated through nine regional clusters. The SmartAgriHubs project is a new way for farmers, advisors and agtech SMES to engage with research centres and research-active higher education institutions. As part of the project, 80 new solutions will be introduced into the market. €6m has been set aside for open calls during the lifetime of the project. Waterford IT is also involved in SmartAgriHubs project as the coordinator for Ireland and the United Kingdom hub within SmartAgriHubs⁵ and this project could potentially be used as a backdrop for fostering cooperation between EU and India in this important topic.



Dr. Martin SERRANO, of NUI Galway, Ireland presented enlightened challenges identified in the workshop already held during 2017 in Kalaburagi, Karnataka, India. The main stressed points were inclusiveness of the stakeholders and how to ensure that all viewpoints are taken into account. “A significant number of the aforementioned workshop’s stakeholders would be interested in participating proactively to the Centre of Cooperation on Digital Villages”, according to Dr. SERRANO.

⁵ <https://www.wit.ie/news/other/waterford-institute-of-technology-announced-as-ireland-uk-co-ordinator-for>



Dr. Shyam DIWAKAR, Director, Prof. Computational Neuroscience Lab, AMRITA VISHWA VIDYAPEETHAM, India, presented the strong role that AMRITA University has played in areas related to Smart Agriculture, including projects related to smart irrigation, monitoring of landslides, and projects related to smart dairy. Dr. DIWAKAR stressed how water scarcity is a major problem in India and directly impacts the villages that rely mostly on agriculture. As water becomes scarce, using it properly is even more important and Technology can help in that respect. Research is ongoing at Amrita University to see how technology can help develop precision farming in the area of irrigation. The aim is to consume less water while using it more efficiently, in order to improve the yield. Dr. DIWAKAR highlighted some EU collaboration projects already being undertaken by AMRITA University and would welcome the chance for continued collaborations.

Mr. Antoine LEBORGNE, presented the work of Stellapps in relation to Smart Dairy, which was also presented during the ABV-IIIT&M, Gwalior workshop on 13th November, 2018. Stellapps is an end-to-end dairy technology solutions company, which started as an IIT-Madras incubated company founded by a group of IIT-ians and technologists with a strong industry background and rich experience. The team includes alumnus from IIT-Madras, IIT-Kharagpur and IIM-Ahmedabad, with over 18 years of Industry experience across Wipro, Nortel, Ericsson, Alcatel-Lucent, AT&T, Vodafone, Telstra, Bharti-Airtel, Aircel, Avaya, Cisco et al. The company produces and procures comprehensive farm optimization and monitoring support, which helps dairy farmers and cooperatives maximize profits while minimizing effort. Stellapps' innovative applications and state-of-the-art mechanization tools leverage Internet of Things (IoT), Big Data, Cloud, Mobility, and Data Analytics to improve Agri- supply chain parameters, including milk production, milk procurement, cold chain, animal insurance and farmer payments. Stellapps already took part in the Smart Villages workshop on 13th November, 2018, at IIIT&M, Gwalior and have indicated they would be very willing to be part of the Centre of Cooperation on Smart Villages.



Finally, **Mr. James CLARKE** presented the ongoing work at the Telecommunications Software and Systems Group (TSSG) at the Waterford Institute of Technology (WIT) in Ireland on precision farming dealing with the problem of multitude of isolated systems developed to target individual problems on the farms and addressing the low level of interoperability as well as intelligence/analytics amongst modern farm systems. There is ongoing

research and innovation projects developing solutions based on a holistic environment/platform that will merge together multiple systems, utilizing technologies such as advanced sensing, IoT, AI, Machine learning, wireless, and bio-inspired solutions that will provide analysis of the farm-information collected by individual systems, increasing efficiency and sustainability of modern day farming via intelligent control of on-farm processes.

Another area of expertise in WIT – TSSG is the innovative use of IoT technologies across vertical sectors, including projects involving including data analytics and machine learning for aquaculture industry, smart city solutions for pollution detection, Big data analytics and associated sensors for milk production forecasting, and developing machine learning algorithms for early lameness detection in dairy and beef herds developed across 4 countries, including Ireland, Israel, Portugal & South Africa. All of this work can be focussed towards collaboration with a centre of cooperation in the India setting of development of Smart villages and Smart agriculture.



Next Steps

Mr. CLARKE outlined the next steps to the networking session participants. These include:

1. Summary report of the networking session would be prepared and shared with the participants;
2. Summary report would be shared with the FI-MEDIA funders at the Delegation of the EU to India, European Commission, International Cooperation Unit (DG CONNECT), and Government of India, The Ministry of Electronics & Information Technology (MeitY);
3. Policy makers in (2) will be asked to share further thoughts on how to move forward to establish EU – India Center of Cooperation (or even bi-lateral arrangements in a short term); focused towards development of Smart Villages through the use of innovative ICT technologies.
4. Launch of the Centre of Cooperation ideas by presenting results at the m2m+IoT Forum 2018, 14-15th January, 2018, in New Delhi during the sessions on Smart Villages at this event.
5. Taking up the specific areas of cooperation in the different fields of Smart Villages viz. smart dairy, smart irrigation, smart agriculture, smart energy, smart health care, smart commercial and economic activities, smart education, etc.

