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Workshop Report prepared by IIMC Ireland and Ministere de l'Enseignement Superieur et de la Recherche Scientifique, Tunisia

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1. Workshop Focus

The IST-Africa Initiative has taken a leadership position in promoting the adoption of Collaborative Open Innovation and Living Labs Methodologies to support socio-economic development in Africa

This workshop focused on providing an introduction to the Living Labs concept, examples of operational and emerging Living Labs and how these have evolved in other African States as well as in Europe. It was participatory in nature with group work and presenting of outputs to the entire group. The participants discussed the potential roles of stakeholders in Living Labs in the context of Tunisia in terms of motivations, contributions and expectations. Different perspectives and emerging issues were also identified.

This training workshop was facilitated by Paul Cunningham and Miriam Cunningham, IIMC Ltd, Ireland, Coordinator of the IST-Africa Initiative.

By the end of the workshop, the participants had identified thematic areas that are national priorities where Living Lab methodologies could be used to support Collaborative Open Innovation.

2. Workshop Report

2.1 Introduction

The workshop was officially opened by Prof Noureddine Hamdi. who welcomed the participants and the facilitators - Paul Cunningham and Miriam Cunningham. Prof. Hamdi provided a context for the workshop and the potential role of Living Labs to support Collaborative Open Innovation.

Paul Cunningham, IIMC Ireland provided an overview of the IST-Africa Initiative which is supporting this workshop. The IST-Africa Initiative was founded in 2002 by IIMC, Ireland and has now grown to a partnership with Ministries and National Council responsible for Information Society, ICT and/or Innovation in18 African Member States[1]. The IST-Africa is supported by the European Commission and African Union Commission with co-funding under FP7.

[1] IST-Africa partners: IIMC International Information Management Corporation Limited (“IIMC”, Ireland); Ministerio da Ciencia e Tecnologia (“MINCT”, Angola); Ministry of Transport and Communications (“MTC”, Botswana); Ministere de l’Enseignement Superieur et de la Recherche Scientifique (“MESRS”, Burundi); Agence Nationale des Technologies de l’Information et de la Communication (“ANTIC”, Cameroon); Ministry of Communications and Information Technology (“MCIT”, Egypt); Ministry of Communication and Information Technology (“MCIT”, Ethiopia); Ministry of Education, Science and Technology (“MOEST”, Kenya); Ministry of Communications, Science and Technology (“MCST-L”, Lesotho); National Commission for Science and Technology (“NCST”, Malawi); National Computer Board (“NCB”, Mauritius); Instituto Nacional de Tecnologias de Informacao e Comunicacao (“INTIC”, Mozambique); National Commission on Research, Science and Technology (“NCRST”, Namibia); Ministère de l'Enseignement Supérieur et de la Recherche (“MESR”, Senegal); Department of Science

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IST-Africa facilitates and supports:

- International Innovation, Policy and Research Cooperation;
- Knowledge sharing and Skills Transfer between IST-Africa partners;
- Collaborative Innovation, Entrepreneurship and Adoption of Living Labs Methodologies;
- Information Society, ICT and Innovation Aspects of the Africa-EU Strategic Partnership;
- Awareness of African Research Capacity, cross-border cooperation and participation in Horizon 2020
- Establishment of National Contact Points in IST-Africa partner countries

Ministere de l'Enseignement Superieur et de la Recherche Scientifique leverages the IST-Africa Initiative to actively promote the national research community by

- Facilitating national workshop on Living Labs and Horizon 2020
- Presentations at International events
- Chapter on Tunisia as part of the overall IST-Africa Study on ICT Initiatives and Research capacity
- Publishing articles on ongoing and emerging ICT and Innovation activities in Tunisia on the IST-Africa portal and in the Newsletter
- Raising awareness of upcoming Calls for Proposals and international funding opportunities
- Assists institutions in preparing for new opportunities such as Horizon 2020
- Raises awareness of activities being undertaken in other African countries
- Supporting the publishing of Organisational profiles on IST-Africa portal to raise awareness of activities in wider community
- Has access to IST-Africa Network including Ministries and National Councils in 17 African Countries to share knowledge, experiences and success stories
- Has first-hand experience of what is involved in being part of International funded activities under the European Framework Programme.

Participants were encouraged to visit the IST-Africa portal[2] and download relevant papers and reports

The participants introduced themselves by organisation and by activity. The workshop was well attended with participants from APII; CEA France; Cynapsys, Carthage University; ISCU, Carthage University; Directorate-General for Scientific Research; Ecole National d'Ingenieurs de Sfax; Ecole Nationale Supérieure d'Ingénieurs de Tunis (ENSIT); Ecole Supérieure des Communications de Tunis; ENIT; ENSI; ENSI/CERT; ENSIT University of Tunis; Higher

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and Technology (“DST”, South Africa); Ministry of Information Communication Technology (“MICT-S”, Swaziland); Tanzania Commission for Science and Technology (“COSTECH”, Tanzania); Ministere de l'Enseignement Superieur et de la Recherche Scientifique ("MHESR", Tunisia) and Uganda National Council for Science and Technology (“UNCST”, Uganda).

[2] http://www.ist-africa.org/home/default.asp?page=reports

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Institute of Computing and Management of Kairouan; ICT Ministry; INRAT; IPT; ISI; Ministry of Higher Education and Scientific Research; National Engineering School of Tunis (ENIT); SMARTECO Group; Sup'Com; Tunisia Polytechnic School; Tunisie Telecom and University of Manouba.

2.2 Introduction to Living Labs

Paul Cunningham and Miriam Cunningham provided an introduction to the basic concepts behind Living Labs, the different forms and focus that Living Labs can take, how Living Labs support Innovation and examples of sustainable Living Labs in other African Member States.

The session was interactive with discussion around the types of Innovation supported, types of support that a Living Lab can provide during Pre-Incubation, how a Living Lab can start focused around training and skills transfer in a specific sector or thematic area and gradually ramp up to provide pre-incubation and incubation support and mechanisms that have been successful in other African countries to secure engagement from industry as an innovation stakeholder.

During the discussions it emerged that the ENIS-Sfax (National School of Engineering of Sfax) has recently decided to set up an Innovation Centre within its Department from internal resources to support engineering students and graduates. As a result the timing of this workshop was good to provide insights into elements that the Innovation space could incorporate that are aligned with Living Lab methodologies.

2.3 Participatory Session 1: Stakeholders Roles in Living Labs – Motivations, Contributions and Expectations

The participants split into working groups to discuss stakeholders roles in Living Labs from a Tunisian perspective. They discussed motivations (Why would they get involved in a Living Lab?), expectations (what would they hope to achieve?) and contributions (how they could make a difference?) for four initial stakeholders groups - public sector, private sector, research and education sector and communities (end users). Each group then reporting back their findings to the entire group.

The motivation, expectations and contributions attributed to each stakeholder group is summarised below based on the outputs presented by each group:

Public Sector	
Motivation	To bring industrial sector closer to Research and visa versa (win-win situation); Pave the way for other research ideas; To facilitate a switch from "consumer" to "prosumer" (produce and consume) society; Improving the

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	relationship between university and other stakeholders in the project; Support creation of new enterprises; Wish to solve socio economic problems of communities; Share problems and solutions between different actors in society; In the case of a Living Lab focused on telecommunications - increase interaction between private sector (industry) and research actors in this domain; Create collaborative environment
Expectations	To have touchable impact in relation to supporting the workforce (enhance employability and increase employment rate) and wellbeing for individuals; Make Tunisia move visible and attractive to the world; Economic development; Reduce the unemployment rate; Create good investment environment; Efficient use of available resources; Increase success rate of innovative ideas; Increase the usage of new telecom technologies (for example: optical and fibre)
Contribution	Financial contribution to ameliorate infrastructure costs; Logistics; Facilitate judicial procedures to support easier access to information sources to research purposes; Decrease administrative bureaucracy; Financial Support / contributions; Legal framework to support the set up of Living Labs

Private Sector	
Motivation	To have access to a locally qualified work force in specific domain; More cost effective work force (as practical training will be facilitated through Living Lab); Collaborate with other SMEs in same domain but with different complimentary expertise to create better product or services rather than compete (Example: GPS tracking system could have one Living Lab for software and hardware development thus providing stronger national product and service); Expand private sector; To be better able to adapt to Innovation; Develop applied projects to decrease the gap between theory and practice; Find new market opportunities; Increase corporate profile; Leadership in the market; Societal role; Increase return on investment (ROI); Find new market opportunities and ideas; Publicity; Economic Gain; Creation of new services and products; Train Workforce
Expectations	Avoid long training requirement for new staff (reduce timeframe to be ready for job); Increase profit; Be innovative and creative thus a leader in its domain; Profit generation; Expansion towards international markets; Develop a new product; Training; Diversity the market; Enhance current and new services and products; Promote corporate image; Strengthen relationship with academia; Technology Development; Technical optimisation of existing systems
Contribution	Financial Support; Infrastructure (for example if it has specialist equipment it could host the Living Lab and provide access to current tools as a starting point); Domain expertise and professional competence from employees; Provide opportunity for students to get more practical experince; Reinforce capacity building; Scholarships; Manpower / Human Resources; Know how; Experimental Tools and Skills; Equipment and components for demonstrations

Education and Research	
Motivation	Concrete results from research; Up to date curriculum; Future work / jobs; Funds; Develop applied projects to decrease the gap between theory and practice; Improve scientific production; Research in order to solve the problem of unemployment; Improve curriculum; Improve know-how; To

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	improve teaching tools and skills; Broadening Knowledge with experimental tools and skills
Expectations	Have concrete environment for project that can be referenced and brought forward in future projects; Increase knowledge in the domain; Scholarships / internships; Enrichment of scientific research and its implications on teaching and learning; Better management to coordinate the networking collaboration; Improve expertise; Increase the employment rate of graduate students; New funding opportunities; Strengthen collaboration with private sector; Digital Library; Test beds; New results developed
Contribution	Provide expertise and infrastructure; Give student opportunity for more practise; Co-funding; University infrastructure; Involve students; Staff expertise; New theoretical studies; new service and equipment

Community (End-users)	
Motivation	Satisfy consumer needs; To be technologically up to date; Blend technology into lifestyle corresponding to personal needs; Impact on the economic development of the community; Solve every day problems and specific problems such as pollution; create new employment opportunities; Identify if communities across the country have similar challenges; Improve existing infrastructure
Expectations	Contribute to well being of individuals; Respond to consumer needs; Scientific progress; Economic progress; Improvement in the quality of life; Increase the employment rate of graduate students; New funding opportunities; Strengthen collaboration with private sector; Digital Library; Test beds; New results developed
Contribution	Highlight needs and as consequence become future consumer of that product; Participate freely in making the projects succeed (e.g. provide content for database, spaces for work, promote activities, provide flyers, leaflets) Providing links between govt and project developer; Clear description of the problem to be addressed; Deeper understanding of the local environment; Human Resources; Equipment; Administrative policies; Incubation offices

2.4 Six Thinking Hats Methodology

Session 2 Harvesting Different Perspectives and Emerging Issues on African Living Labs was based on the Six Thinking Hats Methodology published in a book by Dr Edward de Bono in 1985. It is designed to provide a framework based on creativity and collaboration rather than argumentation (the more traditional “I am right, you are wrong”). The methodology is based on focusing group members on thinking about issues from the same perspective at the same time, before moving on to considering the problem domain from another perspective.

It uses an easy to understand metaphor of six hats, each with a different colour and each focused on a different way of thinking. The participants are asked to put on and take off the same coloured hat at the same time, thus ensuring robust output from working group meetings, by tapping into collective wisdom.

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White Hat Thinking - Facts

White Hat Thinking focuses on data, information and facts, and is neutral and objective in style. Relevant questions include “What do I know?”, “What do I need to find out?” and “How will I get the information I need?”

Red Hat Thinking - Feelings

Red Hat Thinking focuses on feelings, hunches, gut instinct and intuition. Feelings can change over time and no reasons are required for having a feeling at a specific point in time.

Black Hat Thinking - Caution

Black Hat Thinking focuses on difficulties, potential problems, the devil's advocate, or why something may not work. It identifies potential risks, and logical reasons must be provided.

Yellow Hat Thinking - Benefits

Yellow Hat Thinking focuses on values and benefits, and why something may work. It identifies potential benefits and useful ideas, and logical reasons must be provided.

Green Hat Thinking - Creativity

Green Hat Thinking focuses on creativity; possibilities, alternatives and new ideas. It provides potential solutions or alternatives to address problems identified through Black Hat Thinking.

Blue Hat Thinking – Process (Big Picture)

Blue Hat Thinking focuses on managing and organising the thinking process, providing an overall focus, and identifying and developing next steps and action plans.

Harvesting Different Perspectives and Emerging Issues

Each of the tables below capture the key concepts and contributions made by the individual working groups for each Five of the Six Thinking Hats, as that specific way of thinking applies to Living Labs. All outputs for each of the Five Thinking Hats (White Hat Thinking - Facts; Red Hat - Feelings; Black Hat - Risks, caution; Yellow Hat - benefits and Blue Hat - Big picture) discussed were presented to the entire Working Group.

White Hat Thinking - Facts	***What do I know about Living Labs?*** Concrete environment to put research (theory) into practice; Different stakeholders gathered together sharing common interest and goal; Build links and trust between universities and other stakeholders (Industry, financial support and resources, government authorities, end users); Outcomes include i) technical support and equipment; ii) Experts (conception of an efficient business plan for each idea); iii) exploring deeply new ways and domains to improve relationships between different components of each party; Creating links with government plans; Market needs analysis; Questionnaires, surveys, media; Collaboration between end-users and stakeholders to create innovative

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	product ***What do I need to find out?*** Real examples of Living Labs in Africa; Is there any living Lab in our near environment?; What are the other methodological approaches?; What are the advantages of living labs compared with other approaches?; Engineering Services, Technical, Marketing, Legal Services, Accountancy ***Where to find out?*** IST-Africa website; Government; online research; IST-Africa team; attend workshops

Red Hat Thinking - Feelings	Success depends on the stakeholders involved, Long term project that needs patience; Important to give an added value to the relationship between universities and partners; Opportunity to provide a system; Helpful in the development of nations; Bureaucracy that needs to be address with different stakeholders; May be challenging to build up a project and find partners; Gap between theory and practice taking into account community culture and lack of trust between society components; Trust needs to be built up to support collaboration between end-users, stakeholders and institutions; Need to be motivated to work as a team

Black Hat Thinking - Cautions	Difficult to find funding; Over estimation or under estimation of the effort required by stakeholders; One of the stakeholders withdraws or is unable to fulfil duties by agreed deadlines; Product does not respond to future market expectations; Bureaucracy barriers; Requirement culturally to give people money to research objectives; Potential conflict between different stakeholder groups; Growth of infrastructure; Confusion between working teams; Living Lab can be adversely affected by some members; Not achieving the planned results

Yellow Hat Thinking - Benefits	Increase employment opportunities and decrease unemployment; Improve quality of life in the community; Improve links with industry and other innovation stakeholders; Concretise the ideas and research theories; Make life easier; Meet end users needs; Strengthen the cooperation between universities and industry; Spread applied research; Involve all society stakeholders; Sharing knowledge; Identifying the main idea of living labs based on business requirements; Identifying the resources and their efficient management; Sharing responsibilities between the involved parts (having a fixed program)

Blue Hat Thinking - Process (Big Picture)	Potential project ideas identified include: i) Green Energy is a potential field where projects can be developed based on new techniques such as parabolic concentrations or geothermal energies ii) Exploiting scientific research to be applied to Agriculture in

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	order to improve food quality and increase export possibilities iii) Maritime coast surveillance - identify critical areas (getting information from coast guards), develop a deployment strategy for unmanned aerial vehicle (UAVs) for surveillance. Stakeholders include: coast guards, computer science dept, robotics dept, human rights NGOs. iv) Smart transportation, Smart building, Smart Energy Smart transportation particularly Automotive constructors, Internet Service providers and telecoms operators, smart-devices constructor, consortium and research lab in vehicular networks (VANET) Steps to be undertaken: Analysis of current situation, problems identified, proposed solution, hard and soft conception design based on gathering information from end users, test and feedback

2.5 Brainstorming & Conclusion

The Working Group members engaged in a brainstorming session around national priorities, policies, public and private sector initiatives that could be implemented by supporting the development of Living Labs, potential stakeholders to be engaged, potential skills and resource gaps that need to be addressed and support that could be provided by different stakeholders,

The following outputs were collected during the workshop:

- ***Areas for consideration as Living Labs***
  - *Green Energy - Solar Energy, Vibration and ground energy, Low and high level variation of sea water energy*
  - *Agriculture - cattle breeding, genetically modified agriculture*
  - *Maritime coast surveillance to reduce illegal immigration*
  - *Traffic security and traffic management*
  - *Energy Efficiency*

- ***National priorities that could provide a strategic focus for Living Labs***
  - *Infrastructure development*
  - *Supporting Scientific Research*

- ***Potential stakeholders who should be engaged based on complementary skills, resources and thematic/geographic focus***
  - *Energy - Ministry responsible for Energy, HEIs, Industry*
  - *Agriculture - Ministry of Agriculture, specific depts in Higher Education Institutions focused on Agriculture sustainability and food security, Farming Associations*

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- *Maritime surveillance - Coast Guards, Computer Science Labs, NGOs, coordinate with foreign coast guards*
- *Traffic Management - Ministries responsible for Transportation and Equipment, Interior Ministry, Village Communities, Research Labs, Industry stakeholders*

Prof. Noureddine Hamdi thanked the facilitators and participants for their active participation. The participants expressed their appreciation for the interactive workshop and the knowledge shared in relation to how Living Labs are being used in other African countries. The Tunisian stakeholders will now discuss internally the next steps in relation to how they can leverage Living Lab Methodologies to support Open Collaborative Innovation.

Participants

First Name	Name	Title	Institution/Enterprise
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