Evaluation of LivingLabs

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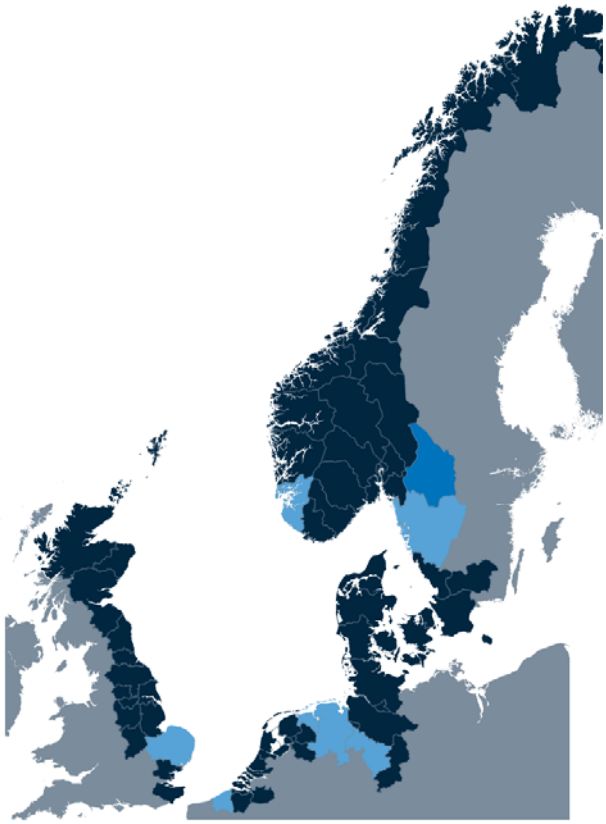


Content

1. What is an E-CLIC LivingLab?

At the beginning of the E-CLIC project the partners defined an E-CLIC LivingLab on base of the definitions and experiences of the five already existing Living Labs, some of the project partners carried on before E-CLIC. It was supplemented by the four definitions of the LivingLabs "Roadmap", "OpenLivingLabs", "Vinnova" and "Wikipedia" (see http://E-CLICproject.com/wp6/Document%20Library/1/Definition%20Living%20Lab_3.doc)

They all show one universal valid point:

LivingLabs give the possibility to engage primarily potential user groups in the development and testing phase of services and/or products.

Of course this point is defined in the E-CLIC application. It says:

"The LivingLab approach will be used to bring laboratory based technology related projects and test-beds into real-life…"

In the application notes you can also find the following statements:

- A user centric co-design/co-creation process with public private partnership;
- Achieve substantial results;
- Make several standardized computer system environments available;
- Facilitate innovation and development of new services at SMEs.

This and the discussions the project partners had on several project meetings resulted in the following definition:

"LivingLabs have the task to make results and facilities of the E-CLIC Centres tangible and accessible. They are open research units of the E-CLIC Centres, where services and products are developed and at the same time accessible for different user groups from specialists and students to the SMEs and the interested public. Basic idea of the LivingLabs is a user centric co-design/co-creation process. Each LivingLab is user-centred and has a special focus and a special role in the network according to the specialist field of the E-CLIC Centres."

2. The three new E-CLIC-LivingLabs

Three new LivingLabs have been established within the E-CLIC project lifetime successfully, which means that the project has reached the target number according to the project plan of the E-CLIC project. Their general aims are – in the partners' own words – to "enable wireless broadband experiments", to facilitate "access to professional studio environments", to improve "services for citizens/SMEs in sparsely populated regions", that go hand in hand with a risen level of quality of life in and a higher attractiveness of these regions, and the "development and testing of services" in a transsectoral cooperation.

Special tasks concern the responsibility for service and service development, the media development and production as well as responsibility for evaluation of wireless broadband access solutions.

The LivingLabs' size, as well as the staff working there, the available work stations and the general equipment – which caters the special needs and tasks of the particular LivingLab – vary from LivingLab to LivingLab, but are satisfying in the partners' opinion. Access restrictions are unusual. The funding of the LivingLabs is in two cases based on a wide range of sources: E-CLIC project, local, regional, and national sources are more common than PPP-models. The third LivingLab is financed only by national sources.

Independent from the LivingLabs´size all three founded LivingLabs represent regional innovation environments focusing on wireless broadband experiments. Besides this technological aspect, the LivingLabs allows insight on to the human understanding of the technology, which is the most important key to the societal deployment of new technologies.

Furthermore LivingLabs allow the evaluation and testing of first services and innovative practices. This is one of the main points why the founded LivingLabs offer a research and innovation platform which can support industries etc. to apply user-driven innovation practices and why these LivingLabs are getting so interesting for regional networks and other institutions.

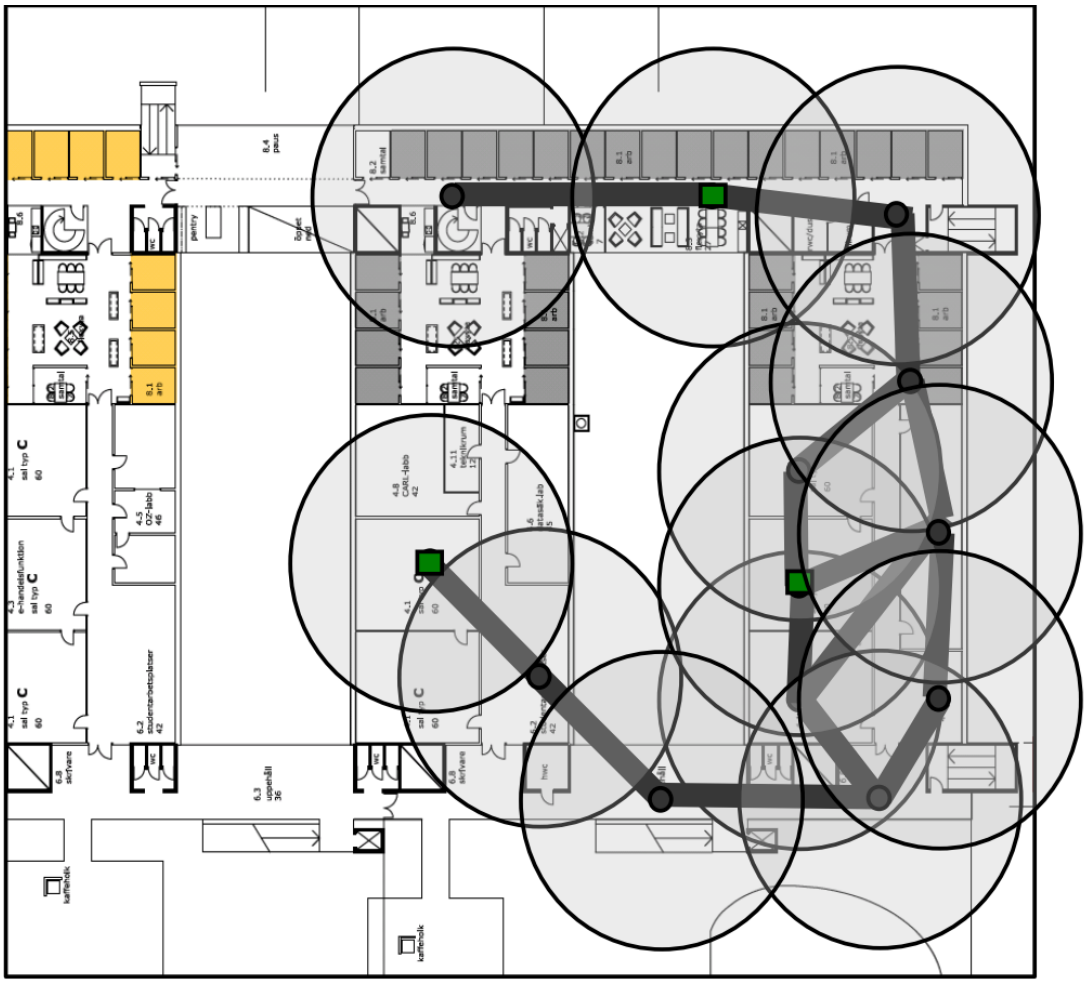
According to the definition of the LivingLabs, these LivingLabs has the general target to be an ultimate environment for innovation of market valid ICT based products, services and contents and to bring in this matter laboratory based technology and test-beds into real-life. Thus the important role of the LivingLabs is to facilitate innovation based on large scale collaboration between users and business stakeholders.

The three new LivingLabs used the best practices from other E-CLIC partners, which had already existing kinds of LivingLabs. The creativity at the development of the new LivingLabs at Hannover, Karlstad and Norfolk are solutions on the basis of broad experience and cross-border collaboration. Experiences are gained and views are broadened over the project runtime.

2.1. LivingLab Karlstad

The first LivingLab we want to introduce is the LivingLab of the Karlstad University in Sweden called KAUMesh.

KAUMesh is an experimental Wireless Broadband Mesh Network based on 802.11a/b/g WLAN based devices (the mesh node) that have been deployed at the Karlstad University Campus. KAUMesh comprises currently 20 mesh nodes, which are permanently installed to cover large areas inside the House 21. Researchers and students from Karlstad University and partner organisations use KAUMesh to develop and evaluate next-generation WLAN and Wireless Mesh solutions.



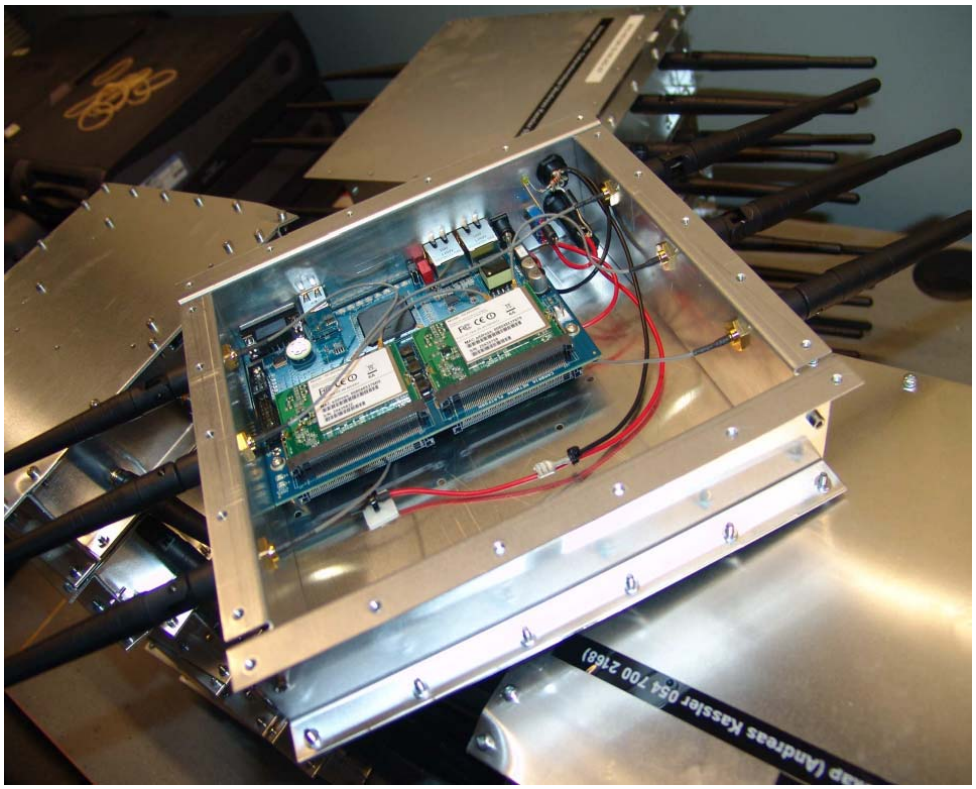
Picture 1: Mesh network of one floor of house 21 at the Karlstads University

Currently the KAUMesh testbed provides the following features:

- 3 IEEE 802.11a/b/g wireless cards per node
- Each node has an Ethernet connection for control and logging
- Remote reset of nodes
- Integrated node reservation and access control system

- Graphical monitoring tools
- A wide range of routing protocols and traffic generators

KAUMesh offers a flexible architecture, both in terms of hardware and software. The deployment allows a quick re-arrangement of the mesh nodes. Users can control almost all aspects of the KAUMesh software (including the OS-kernel) remotely.



Picture 2: Mesh node - multiradio node including Cambria Platform GW2358-4 and three Atheros-based 802.11a/b/g NIC

For monitoring and control purposes each mesh node has a wired Ethernet connection to a managed network in order to send monitoring data to a monitoring server, located in the fixed network. The monitoring server also for hosts configuration information for the mesh nodes and provides software via TFTP and NFS.

2.2. LivingLab Norfolk

The E-CLIC Norfolk LivingLab is based at the EPIC Studios complex in Norwich, Norfolk in the United Kingdom. EPIC is a facility owned and run by Norfolk County Council. The facility provides a combination of tenanted office space, educational space and television studio space.

Picture 3: EPIC Studios in Norwich - Base of the LivingLab Norfolk

In essence the entire complex forms the LivingLab, but in practice it is the television studio spaces that allow individuals and schools hands on experience of technology that they wouldn't otherwise have access to.

The studio spaces are equipped with the latest high definition broadcast equipment and allow a seamless media workflow around the building.

Local schools are invited to experience the LivingLab facilities and participate in a mock magazine show, Norfolk Now. The students, most of whom have never set foot inside a television studio, quickly learn skills both in front and behind the camera. Roles include presenters, interviewers, interviewees, weather presenters, cameramen, floor managers, autocue operators, vision mixers, directors, VT operators and sound engineers. Making television is a team exercise and participants are required to work well together, depending on each other, in order to produce the finished programme.

Picture 4: Students participating in their own “Norfolk Now” experience in the E-CLIC Norfolk LivingLab

The EU funding provided through the E-CLIC project has enabled the EPIC facility to open its doors to individuals, groups and schools. Everyone is encouraged to participate at all ages and all levels of ability. The results are always varied yet the experience is always exceptional. Several hundred individuals have now experienced the LivingLab facilities, many of whom have expressed a desire to go on and work in the world of television.

An example of a Norfolk Now production can be found at the link below. This particular episode of the show was created by students on an exchange trip from Howest University College of West Flanders, who are also partners in the E-CLIC project.

http://blip.tv/file/4829506

Picture 5: Interview in the show "Norfolk Now": Robin Cox talking with Sarah Markewich from E-CLIC Kortrijk

2.3. LivingLab Hannover

The last new developed LivingLab is the LivingLab of the University of Hannover, Germany, which is called “Planet MID”.

“Planet MID” is the rebuilding of the former „Planet M“which was built and used by the media company Bertelsmann during the EXPO 2000, the world exposition in Hannover. „Planet MID“stands for an incubator in **M**edia, **I**nformation and **D**esign and as a platform bringing together science, public relations, media companies and freelancers. It will be base of a network in media business to establish new companies and cooperation with local/regional sponsorships in the area of start-ups and settlement of new companies.

Picture 6: E-CLIC LivingLab Hanover - Planet MID

To set up the powerful network for media companies and freelancers in the creative and design industry, there were in the beginning first efforts to form the "Creative Industries" in cooperation with the Ministry of Economics and Ministry of Science and Culture in Lower Saxony, some relevant organisations in Lower Saxony (e.g. Nordmedia, Niedersächsische Mediengesellschaft mbH) and local institutions as "Hannover Impuls".

The local cluster "Creative Industries" is a cooperation of associations, alliances and agencies in media business. Main objective was to establish a network for media companies and freelancers in Lower Saxony including the whole spectrum of creative business like designers, actors, and publisher and so on. The members will have access to special events and keynotes based in the E-CLIC LivingLab Planet MID - or in the future over a live streaming in the internet as well. The cluster gives the opportunity for bringing together media companies, freelancer, students and also SMEs being interested in media services. The cluster initiative was founded in August 2010.

First steps in the rebuilding of the “Planet MID” were the conception and implementation of all logistical and technical features. Prof. Martin Traub and Mr. Bernhard Többen, designated director of the “Planet MID”, had cooperation meetings with several media companies

regarding the technical facilities of the LivingLab. The state of the art workspaces were planned and built in cooperation with engineers, architects and distributors to get an optimal connection to the technical infrastructure and broadband technology. The main objectives of the installation are the multifunctional utilization for video conference, tele-teaching and production and distribution of IPTV.

E-CLIC Hannover succeeds an acquisition for a key software solution in media business based on broadband and tapeless technology. This sponsorship takes credits of the E-CLIC team Hannover and is a result of the E-CLIC activities on the CeBit 2010. The server technology for NCPower was co-sponsored by the ministry of science and culture in Lower Saxony. The setup of an innovative editorial production system was planned in a workshop with NORCOM AG in February 2011.

NORCOM's software NCPower is an innovative tool for the production data transfer in editorial office and newsroom, postproduction, studio production and the asset management and distribution of large broadcast stations. It offers great opportunities for student projects of different disciplines, first of all in journalism and information management. The software also allows the connection of the members of the network "Creative industries" via IPTV.

Picture 7: Inside the E-CLIC LivingLab Hanover - Planet MID (opening day)

The implementation of technical equipment now is finalised. On 21st of June 2011 David McAllister, Minister President of Lower Saxony, opened the E-CLIC LivingLab Planet MID in a ceremony with special guests.

Picture 8: David McAllister, Minister President of Lower Saxony launching the LivingLab Hanover

3. Comparison of Living Labs

	Karlstad University New developed LL	**Norfolk County Council** New developed LL	**Hannover University** New developed LL	**Noorderport College**	**University of Stavanger**
1. Start planning the LL	September 2008	September 2008	September 2009	September 2009	2009
2. How many persons were involved in the planning of the LL?	1 to 3	4 to 6	6 to 12	4 to 6	6 to 12
3. From what kind of organisations were parts of the planning staff?	Public	Public	Public Private	2 public 1 private	Public
4. How was the dispartment of the costs (in %)?	100% public	100% public	100% public	No extra costs	100% public
5. How high were the expenses for building up your LL?	Ca. 20.000 EUR	Unknown, using existing resources	Unknown	None, except staff hours	400.000 EUR
6. From what kind of organisations are running our LL?	Public	Public	Public	2 public 1 private	Public
7. How high are the expenses for running your LL?	Student and staff to improve and maintain functionality	Unknown, staff costs and overheads on ad hoc basis	Unknown, staff costs of the University	None, except staff hours	Unknown
8. How many persons are permanently involved in running the LL?	1 to 3	1 to 3	1 to 3	More than 12	6 to 12
9. How many persons can use the LL at once?	More than 12, depending on the functionality to be tested, parallel experiments are limited	6 to 12	More than 12	More than 12	Not applicable
10. How many users do you expect per year?	Less 30	More than 121	More than 121	More than 121, the LL is not limited	61 to 120

11. What outputs do you expect for your LL?	Experiments in the area of Wireless Broadband Systems; Different protocols can be evaluated for performance and functionality purposes	Booking from school groups	Technology transfer / design incubator	Prototypes in manufacturing fields, e-health case studies, QR codes in museums etc.	eLearning solutions

4. Conclusion

The three new implemented E-CLIC Living Labs cover three different subject areas. The most universal area is filled by the Norfolk County Council Living Lab. By providing the latest high definition broadcast equipment and allowing a seamless media workflow it is not only possible to produce almost all kinds of media. In fact it is a tremendous instrument for dissemination, which in turn is not only extremely important for projects as E-CLIC. Advertising information, competences, findings, ideas and so forth is the first step to establish new networks, find new contacts, competences, approaches and much more. The Norfolk County Council Living Lab expects more than hundreds of participants over the three years, and in fact schools book groups up to 15 students at a time pass through this Living Lab.

In opposite to the other two E-CLIC Living Labs the Karlstad University Living Lab KAUMesh is a much specialised one. KAUMesh was smoothly started at September 2008, but the real implementation started at September 2009 so that the first version was ready to some parts and the team worked at ongoing processes to improve all features.

The last new implemented Living Lab is the Living Lab of the University of Hannover, which is directly situated in the physical area of the new Campus Area of the University at the Expo Plaza at Hannover/Germany. The LivingLab Hannover, which implementation also started at September 2009, expects more than 8000 users per year, because of the size of the LivingLab (its direct integration at the new Campus Area) and the possibility to work there with student groups up to 200 persons per periodic lessons. Furthermore because of the linkage to regional networks and SMEs, the LivingLab Hannover expects more than 2000 external visitors from SMEs, networks (e.g. Hannover Impuls) or Start-Ups.

So it is shown at the evaluation of the three new developed LivingLabs, that every LivingLab works under a special issue and with different ideas of the number of users (depending on the spatial size of the LivingLab), but all have the same idea – based on the application of the E-CLIC project – to establish cooperation structures between the LivingLabs and regional/national bodies.

Until now, cooperation between E-CLICs Living Labs and other Living Labs (like comparable institutions at the Noorderpoort College or the University of Stavanger) has been established. The same is the case regarding cooperation to research institutions which are partners within the E-CLIC project. Public bodies and private actors (four cooperation's, including PPP-models, too) build collaboration partnerships with the Living Labs, as well as research institutions (i.e. universities) outside the E-CLIC project.