The Bricophone project

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AN OPEN SOURCE COMMUNITY-ORIENTED MOBILE PHONE INFRASTRUCTURE

Description

The Bricophone is a Community-Oriented Mobile Phone Infrastructure in Open Source. It's a Low Cost/ Low Energy/ Open Hardware/ Open Source project built for communities inferior to thousand people and regional distances. The characteristic of the Bricophone infrastructure is that it doesn't necessitate any static infrastructure like relays/antennas and digital data centers. This particularity permits special uses as equipment in poor areas, mass rescueing in disastered areas, cultural and social activities like festivals or mass events. As an Open Source project, the bricophone is intended to be build by yourself or by digital artisans.

Conceptual steps/ History of the project

This project started in Paris in early 2007 at Art Sensitif Ressource Center. This non-profit center try to organize ressources, research, developpement and workshops about interactive, electronic and digital arts in France. The original idea came at the evocation of Amazonia Indians struggling against illegal gold miners in Brazil, teachers protesting in Oaxaca, farmers protesting against copper mines in Peru, G8 and WTO protests, and different recent natural catastrophes like hurricanes in tropical areas, big energy failures in US, earthquakes, tsunami in Indian Ocean, and many other zones where human rights and freedom of speech are not respected.

Bricophone user's profiles

❖ populations and communities in areas where regular cellular phone infrastructure is not possible for **economical**, **political**, **energetic** or **environmental reasons**: areas with poor population density, mountains, seas, desertic or humid areas, protected natural or archeological sites, dictatorship or censorship.

❖ populations and communities in areas where regular cellular phone infrastructures are in **energy failure** or have been **destroyed** : war, earthquakes or natural catastrophes as floods, cyclones, cold or hot periodes.

❖ communities in social or cultural **mass events** as festivals, protests, gatherings.

❖in big buildings, as an emergency telephone infrastructure, in case of failure of cable telephony/electricity

Warning

The Bricophone is not a alternative for regular cellular infrastructures nor an open-source cellullar phone for regular mobile phone networks, like different Linux-phone projects**. The Bricophone is not another webphone project. It's a technically, politically and economically independent mobile phone system from the actual cellular phone structures, and tries to contain all the technical and ethical possibilities to guaranty freedom of speech.** Remember: the limited performances of the technology just allow community communications in limited areas.

Bricophone networks are local entities for global ententes.

Features and particularities of the Bricophone

The goal of the Bricophone infrastructure is voice communication only. It works with new wireless sensors network technologies used in industrial equipements. The main caracteristics of this new sensors technologies are *mesh-networking*, *low-cost* and *very low power consumption*. These three technical caracteristics are the key of the project's potentialities.

•**Mesh networking** is a technology where each point of the network can route information to any other point in the same connected network. The routing of the information is automatically done, as in internet, by an automatic choice of the closest device and the best path. A small quantity of bricophones, disseminated not far from the others, can automatically build an operative network. Routing-only bricophones can extend the size of the network.

•The **Very Low Cost** of the specialized wireless chips of the Bricophone allow to equipate different devices, not only for building mobile phones, but also for building Routing-only bricophones (and eventually equipate routing devices to transfer the calls through Internet). The low cost allied to the relative simplicity of the hardware allows also DIY possibility and further improvements by the Bricophone community, as we can see in the Arduino project (sensor/actuator interfaces for artistic creation).

•The **Low Power Consumption** allows the utilisation of solar, wind or muscular energy, or very long time powering with classical battery units, more environemental-friendly than NiCD or LiON batteries. Long energy powering bricophone routers can be abandouned and active during month or years, even in harsh environnements, balloons, top of the trees etc.

Project setup

The first technical works and consultations were made during 2007s spring and summer, through the Bricolabs network (http://www.bricolabs.net) and **Rob Von Kranenburg** contacts and several high quality developpers have approached or joined the project: **Philippe Langlois**, artist from xlrmx.org , network engineer and artist, **Denis Jaromil** artist from Dyne.org about the possibility to implement Netsukuku techniques in Bricophone, **Rama Cosentino** artist from Giss.tv, hackitectura.net and riereta.net, **Cyrille Henry** , artist involved in the Pure Data community (open source software for artists) and other artists and personnalities in the world. The global coordination is leaded by **Jean-Noël Montagné** artist from artsens.org

First workshop

The first workshop has taken place few days ago 28 september 2007, in artistic research center **FoAM** in Bruxelles. Conceptualisation, definition of the users profile, technical possibilities were at the menu of ten participants. The next workshop will be organized at Waag in Amsterdam, and will be streamed to the **Mobilefest** Festival in San Paolo, Brazil. 21 to 26 november 2007.

Following steps

As many open hardware/open source software projects, the future of the projects are deeply-community dependant, but here could be the next steps:

● A multilingual website replacing the first existing pages: **http://www.bricophone.org**

• Installing ommunication tools for community works: wiki, code repository, forum, mailing list

• Prototyping workshops in hardware, software and community tools in Paris (F), Sao Paolo (Br) , Bruxelles (B), Amsterdam (NL), Sheffield (UK), Barcelona (E) during 2008.

• Communication and partnership : **Artfactories** network, http://www.artfactories.net Platform of international resources for creative centres, sharing the same art center in Paris and **Bricolabs** network http://www.bricolabs.net/ are participants of the project and could disseminate the knowledge through their networks.

First dissemination workshop

The first DIY fabrication and dissemination workshop could be in Dakar, Senegal, in the **Ker Thiossane Art Center**, during **Pixelache** 2009 festival (Helsinki, Paris, Dakar, Bogota) http://www.ker-thiossane.com/.

Further dissemination workshops could follow in the different continents, at the initiative of local community members.

Technics

The Bricophone core comes from the bricolage of new wireless sensor technologies and protocols turning around IEEE 802.15.4 international certification.

Materials:

The industry of autonomous wireless network sensors started less than 10 years ago, and most of the products arrived on the market in the last 4 years. The international wireless certification of such materials just arrived in **2006** and allows wireless sensor networks without licencing (ISM licences) in most of the countries in the world. This technology is now in its maturity.

Due to the main Bricophone performances included into the design of sensor-network chips, the Bricophone project is highly-material dependant. Many developper kits will have to be tested in order to find the best technology to have the better performances in terms of routing technologies, wireless range, power consumption, compacity and ability to serve big bricophone networks.

As many wireless projects, several tests in many different situations and configurations have to be done and necessitate adequate laboratory tools. A funding demand for buying prototyping tools as been done to a foundation specialized in Open Source projects in Netherlands.

Planification

September 2007	First workshop on concepts and technical feasabilities.
October	Web and communication works / community tools / administration
November	Second workshop/Materials equipements and components ordering
	First prototyping workshops
November to summer 2008	Prototyping and researches, technical gatherings and workshops
Summer 2008	First test implantations
Winter 2008	First user experiences and debriefings
Spring 2009	First building workshops in Africa

As an open source project, (cf. Arduino project, http://www.arduino.cc) the Bricophone project will be community dependant. The aperture of the project to other developpements is a key to the success. Many events related to the Bricophone will emerge from the creativity of the users and the developpers of the project.

Risks

There is a technological risk on wich no-one can predict now, about the quantity and the quality of calls that can be routed through a big bricophone mesh-network. Even the producers of this brand new technologies have no answers yet, however, they announce that their networks can have more than 65 000 nodes (for regular sensors...). Our first estimations suppose a critic mass of just a thousand (hundreds ? people **in the same network**, not communicating at the same time... wich is enough for our goals (rescuing people in disasters, activist events etc) and because **there can be several parallell Bricophone networks**.

Dissemination

The succes of such project is really related to the wishes of the concerned populations, to the technical and to the cultural community anroud the project. In open hardware projects, the success can come very quickly. Our international cultural networks are strongest enough to disseminate the goals and the knowledge about the project. The cellular phone "buzz", through many blogs or information services, is also the quickest in the world...

Contact

 First members of Bricophone project are Jean-Noël Montagné, Philippe Langlois in Paris and Nice, France, Rob Von Kranenburg in Netherlands/Belgium, Paulo Hartmann in Brazil.

Website: http://www.bricophone.org
Technical links for technical people: http://del.icio.us/poppop/bricophone

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