DeViNT day, Sophia-Antipolis, France
20 MAY 2010

SESSION 1 : **New Information and Communication Technologies for daily use : benefits and limits** (by F.Lestel, vice president of APEDV*)

(*APEDV= French Society for Visually Impaired Children)

Issue

- Visually Impaired and blind persons have difficulties to move around towns autonomously
- they do not use easily the computer mouse
- the miniaturisation of screen and keyboard is not an advantage !

- ➔ they need accessible and suited tools

History

- Convergence of computers and telecommunications since the end of 20th century :
  - Computer manufacturers miniaturise it, then add a modem
  - mobile phones manufacturers enlarge the screen, increase memory and processor, add an efficient camera, sometimes a GPS chip, etc…
  - some GPS manufacturers make it communicating…
  - Arrival of other actors on the market for other applications : list rapidly raising.

➔ Convergence towards a low price, miniaturised, communicating « *multifunction* » computer : the **SMARTPHONE** (e.g. : iPhone by Apple, Nexus One a.k.a. « Google Phone » with HTC, BlackBerry, several Nokia models, Sony-Ericsson, Motorola, LG, Samsung, HP with the late bought of Palm, …)

- 1 Billion Smartphones are the World forecasts by 2014 !

- **Operating Systems** heterogeneous, but Symbian norm more accessible as open source since 21/OCT/2009 (bought by Nokia). Other OS : Windows Mobile, Palm/Garnet, iPhone OS, or open sources based on Linux (Android, Bada for Samsung),…

Ergonomics of Smartphones for VI & Blind

➢ The **Google Phone** arrives in France (SFR in May) : can be tested at the Google booth today.
➢ the Google Phone proposes a speech recognition (a.k.a. speech-to-text) for typing e-mails, and an eyes-free interface (to be tested at the Google booth). Not on iPhone today.

➢ In case of disabled hands or fingers: ➔ small mechanical keyboards not suited. Large tactile keys preferred.

➢See dedicated session for accessibility

iPhone

Googlephone Nexus One

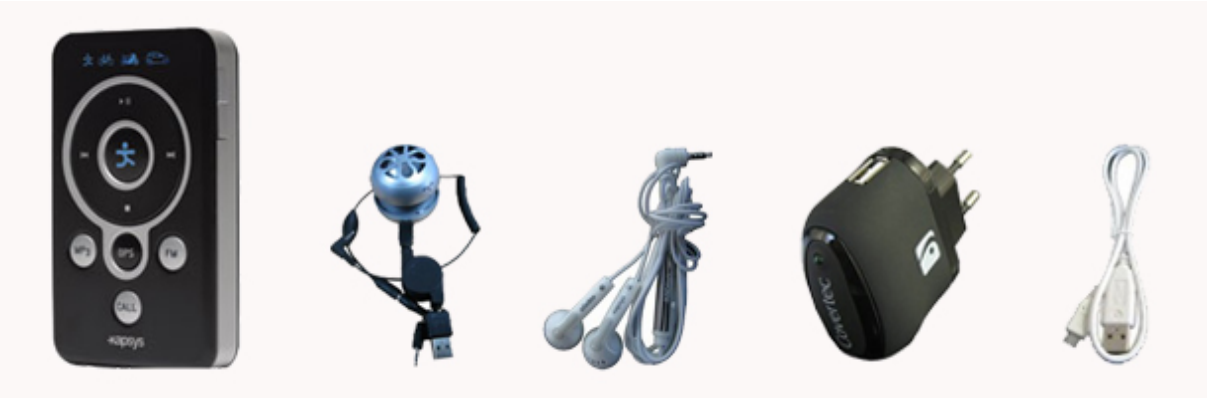
Some applications of smartphones for VI and/or blind (1/5)

A) Pedestrian guidance in town

➢ Reminder : French law imposes that, by 2015 at the latest, all public transportation means are able to inform passengers in a visual and acoustic way, upon destinations, arrival to stops and exceptional events (works, strikes, etc...).

- **Existing applications** :
  - **GPS** including town map with addresses of shops and public transportations, with speech synthesis + zoom) : can be basically integrated on a smartphone. The European GPS (Galileo) should be operational by 2014.

  - **KAPTEN** from the company **KAPSYS** is a GPS without screen for pedestrians (speech synthesis and voice control). It only weighs 50 grams and is a FM receiver and MP3 as well. Price 238€, see KAPSYS booth.



Some applications of smartphones for VI and/or blind (2/5)

- **Existing applications, continued**

  o **BINAUR-Angéo** : dedicated module with GPS & phone hot line (already presented for DeViNT 2008)

  O **Easy Go**, made by Navocap, guides persons during bus transport by providing indications on the journey (stops, itinerary, etc.) suited to handicaps.

  o **Flashcodes**. RATP (Transports of Paris) has equipped the bus stops of Paris with « Flashcodes code-bar » , indeed pictograms made of assembly of black & white squares. Quick and inexpensive for getting an updated information for people with good vision, or visually impaired with sufficient vision to find the code bar and aiming their phone towards it. The blinds will have difficulties to find the code bar, and RATP made the choice of proprietary coding FlashCode instead of open format QR.
  ➔Application downloadable by SMS, sometimes pre-installed on some recent phones.

Some applications of smartphones for VI and/or blind (3/5)

• **Applications under development** : the **PANAMMES** project develops and tests up to 2014 in Paris several innovative technologies.

- Alternative to GPS, the **GSM geo-localisation** system proposed par French GSM provider **Orange** (see ORANGE booth) is under development and will test :
  - a GSM geo-localisation system with an accuracy 0.50m max. in town, using a mobile phone with an interface accessible to Visually Impaired, blind, or with crippled hands,
  - a geo map database
  - a user guidance with help from the video camera of the phone.

- **Lumiplan Ville** proposes to develop a broadcasting of urban information towards a mobile phone, when passing next to the display board. The device includes a vocal & keyboard interface, which allows Visually Impaired to access to running messages.

Some applications of smartphones for VI and/or blind (4/5)

o **Phitech** (see booth) equips since 1st December 2009 a dozen of sites around Opera Bastille and “Quinze-vingt Hospital” so that VI’s can test for 6 months the **Actitam** system, based upon radio beacons with a real time broadcasting onto a small telecommand or a mobile phone of suited information. Deployed in certain public buildings (Opera, Institut de la vision,…) and shops, it allows to localize the entrance, to move inside and to get an assistance on demand.
Can also localize a taxi station, a metro entrance or a bus stop and to get by speech synthesis all information broadcasted by a display panel : real time bus or metro timetable, for instance.

o **ReDyn** has created the **Weazz** system composed of :
- A small audio terminal, or its software equivalent on smartphone with same functionalities.
- A beacon to be installed close to places and objects to be shown to VI’s.
- A parameterised audio Internet service.

Provides information :
- for safety : obstacles and dangers within a 15 meter radius, works for example,
- orientation within a place : vicinity of a bus stop (with indication of the approaching bus number), all shops and public buildings (and even inside orientation)
- social link by par institutional/commercial/social ads.

Some applications of smartphones for VI and/or blind (5/5)

o The **ESIUM** company proposes a selective marking (**WESI**), whose vocal beacons can be received on a universal VOCALISE telecommand, or even GSM (no incoming call, no software).

o the **EO-EDPS** company (see booth) proposes audio devices enabled by mobile phone for :

- preparing the move and downloading an itinerary,
- using public transportations,
- crossing a road equipped or not with crossing lights,
- approaching buildings and getting their main entrance.

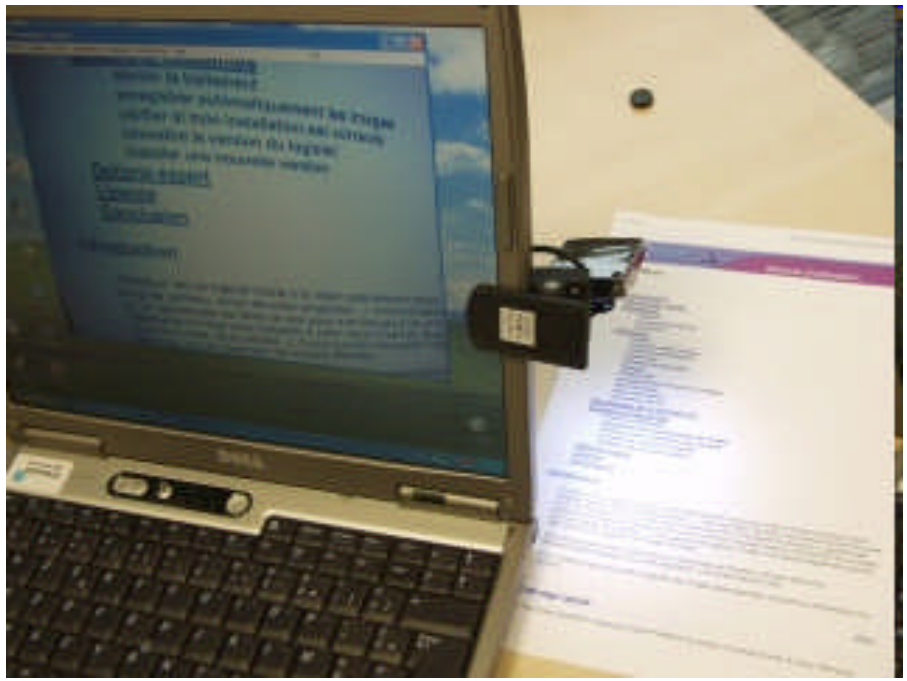
o **BlueEyes** is a dynamic guidance service by Bluetooth beacon network on the underground ways Métro/RER. The user receives information on his mobile phone for the way to follow. Tested during 1st semester 2009 in several métro/RER stations : 100% satisfaction index for the beta testing group with good vision (old persons, tourists, occasional) and 76 % for VI testers.

Other applications of smartphones for VI and/or blinds (1/3)

B) **zooming** : the smartphone camera is displayed and zoomed on the screen (real time). There was already a free software (**Portanum** from **THALES**, see booth) who allowed to display a document or an image of the blackboard on the laptop, to increase contrasts, to modify colours and luminosity, and to zoom.

➔ Limits = camera pixel size and processing time ;

Eyeglasses on iPhone (2,39€)



Portanum on Laptop (free)

Other applications of smartphones for VI and/or blinds (2/3)

MDI (Mobile Document Imaging) :

takes snapshots, processes them to rectify the image, improves contrast, detects words by OCR, can zoom or send them by MMS.

With dedicated terminal ➔

eMDI of **Intermec**

Or on mobile phone :

example **KNFB Reader** (expensive software – 790€ - but including speech synthesis : text spoken after a short processing time), available on models **Nokia N79, N82, N85, N86 N95 8GB and 6220 Classic**.

or « **Business Card Reader** » on iPhone (4,99€)

Other applications of smartphones for VI and/or blinds (3/3)

TopBraille (see SAS-Vision booth) has improved its product : the camera and the OCR will include a speech synthesis by word and not by letter.

Code-bar reader :
After free download of TextInfo software for Symbian phones, already tested on N95 and N82; this software uses the same standards as textinfo for PC, and we can scan the code-bar available on all commercial articles, and if they are referenced in a database on txt format, the description of the corresponding article is displayed on the phone screen, and pronounced by the speech synthesis. The base had 7056 very common articles on 1st January 2010, it will be extended particularly to drugs. This software (developed in Java) is normally compatible with all Bluetooth code-bar scanners, the code-bars being presently not localisable with the fingers on the packing, which does not allow the blinds to aim the phone camera to it.

Limits of NICT for daily use (1/2)

- **Return on Investment :**

  - o Cost of hardware, software, maintenance and renewal
  - o Gold plated versus real needs, so under-use of software.
  - o Cost of training for sales personal and users, their reluctance to changes.
  - o Cost induced by high rhythm of innovations (18 months) and overflow of information.
  - o Return on investment not easy to quantify for new products in small series for VI's.
  - o Too many Hardware and software manufacturers, no stable standard.

Limits of NICT for daily use (2/2)

- **Other problems :**

  - o ergonomics for VI or disabled hands (sensitivity for keyboard or screen)
  - o Cost of purchasing and maintenance
  - o material and software obsolescence's treatment
  - o battery autonomy (Wifi consumption higher than GSM, Symbian is less consuming,…)
  - o other ?

Other helps and conclusion

- Besides the mobile phone, there are guides for almost each big city to ease life of Visually Impaired, downloadable in pdf and editing all facilities accessibility for Impaired persons (transport, public services, reserved blue parking spots,…)

- The smartphone will become the indispensable companion for the Visually Impaired or Blind persons, and there will be probably in the years to come even applications for which we haven't thought yet today…