

# Smart Cards: barrier-free mobile communication

Augmentative and alternative communication solution for people with cognitive disabilities and / or older people based on the use of mobile technology and NFC pictographic cards.



## Contact information

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## Technological Offers type

Technological solutions

## Research and innovation areas

- Digital Technologies, Artificial Intelligence, Cybersecurity, 5G, Robotics
- Health and Wellbeing

## ODS



Available from: 2020

## Where?

### Life Support Technologies

Keywords: | [communication](#) | [inclusión](#) | [NFC technology](#)

#### Brief description of the technology solution and the added value it provides

Life Supporting Technologies Group at UPM has developed a solution based on NFC technology aimed at users with different disabilities (autism, cerebral palsy, etc.), literacy difficulties, older people in general or no technical skills profiles. The aim of this solution is to provide an assistive product that facilitates an effective form of communication adapted to the needs of each user. The solution uses NFC technology on the pictographic cards Smart Cards, which contain a message or predefined functionality. The user only has to bring its mobile terminal close to the Smart Card so that the device interprets a message that will be played by text-to-speech synthesizer, or perform a specific function. The main advantages of Smart Cards are its versatility, simplicity and customization options to meet the different needs of users with a low-cost solution.

#### Description of the technological base

Smart Cards solution and its smartphone app open a new paradigm in the use of NFC technology in the important field of augmentative and alternative communication. This solution provides users with a new interface that revolutionizes the way they interact with people. The product is natural, safe and easy. It does not require learning and therefore is suitable for elderly, and users with intellectual or cognitive disabilities among others. NFC technology allows to perform automatically different functions of the mobile terminal in a transparent and reliable way for the user. Currently, there are no other technological frameworks that have applied this technology to the field of augmentative and alternative communication. In addition, Smart Cards can manage home automation in a simple and intuitive fashion.

***“Smart Cards applies NFC technology to assistive products market in a new and useful way, and mainly to augmentative and alternative communication sector. Smart Cards uses a low cost universal product that saves more than 70% over existing solutions”***

#### Market demands

- There are people with cognitive disabilities, limited literacy and speech skills that limit their personal and professional competence.
- In many cases, people with cognitive disabilities have learning problems. The educational games are a major helpful tool due to their therapeutic potential.
- Currently existing solutions on augmentative and alternative communication are dedicated solutions with a high price (e.g. TOBI C15 price around 7,000 €). It would be desirable that the price of these solutions was not a barrier, and therefore it is necessary to provide low cost solutions.
- Currently, smartphones and tablets are complex devices for older people or others without technological expertise. People with severe and profound disabilities may be particularly vulnerable to social exclusion. Technologies can help to minimize this social gap.

#### Competitive advantages

- To offer an intuitive and natural interface that brings technology closer to the elderly or technology inexperienced people.
- To be customizable according to user needs.
- To allow educational use as therapeutic educational game, using different learning applications to help users with learning difficulties (e.g., Down syndrome) or attention deficit hyperactivity disorder (ADHD); and secondly, applications to encourage communication and user self-regulation with autism.
- To reduce costs. For example, Smart Cards saves approximately over 70% compared to a dedicated solution.
- To use a mature technology compared to some existing solutions which are based on immature technologies, obsolete or insufficient to assistive level (such as QR codes).

#### Previous references

- Over 15 years of experience in the field of accessibility, and 12 years experience in R & D of these solutions.
- Mastery of advanced technologies that are not currently used in the field of accessibility.
- Finalist in the category of Independent Living of the 1st edition of the Smart Accessibility Awards Vodafone Foundation (<http://developer.vodafone.com/smartaccess2012/2011winners/>), with a prototype of the solution, BOARD, validated technologically and tested for 3 profiles different users (people with cerebral palsy, Parkinson's disease and Down syndrome).

#### Intellectual property

Software registration in process.

#### Development stage

- Concept
- R&D
- Lab Prototype
- **Industrial Prototype**
- Production

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