Realising social inclusion for persons with disabilities and delivering effective science communication through sustainable ICT solutions: a case study from the University of Pavia

Silvia Favalli, Flavio Ceravolo, Matilde Ceron, Anna Facchinetti, Giulia Melis, Vittorio Pampanin, Marco Porta, Beatrice Rabai, Carola Ricci, Francesco Scervini

University of Pavia

Abstract. This paper introduces the research project RISID («Realizing the right to social inclusion for persons with disabilities through new tools of smart communication and sharing knowledge: from international to local effectiveness»), which embraces a multidisciplinary perspective involving experts in law, economics, sociology and engineering. On the basis of the theoretical analysis carried out, a digital tool named "SmartInclusion@unipv" (SI@) will be developed to implement the accessibility of the courtyards of the Palazzo Centrale of the University of Pavia and to effectively share scientific knowledge. The App SI@ is presented as a case study of sustainable ICT

Keywords. Sustainable ICT; Disability; Human rights; SDGs; Social inclusion; Science communication; Accessibility at University

Introduction

This paper introduces the background, objectives and implementation of the project RISID («Realizing the right to social inclusion for persons with disabilities through new tools of smart communication and sharing knowledge: from international to local effectiveness»), financed by Fondazione Cariplo and developed by the University of Pavia in cooperation with the disability NGO Fondazione ASPHI onlus, acting as a consultant.

The research is conducted adopting a multidisciplinary perspective and combining different research methodologies both qualitative (legal and sociological analysis) and quantitative (experimental statistical analysis and utilization of surveys). On the basis of the theoretical analysis carried out, a sustainable ICT (the smartphone App "SmartInclusion@ Unipv" or SI@) working within the courtyards of the University of Pavia will also be improved as a final outcome

1. Sustainable ICT solutions: fostering social inclusion and spreading scientific knowledge

The widespread use of information and communications technologies (ICTs), including digital technologies, and global interconnectedness worldwide have the potential to brid-

ge the digital divide and to develop knowledge and inclusive societies (Ricci 2019). New technologies play a pivotal role in the development of the ambitious United Nations 2030 Agenda for Sustainable Development, with particular reference to the realization of goal 3 (ensure healthy lives and promote well-being for all at all ages), goal 4 (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all), goal 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), goal 10 (reduce inequality within and among countries) and goal 11 (make cities and human settlements inclusive, safe, resilient and sustainable). However, the ongoing process of digitalisation, which is a key part of the fourth industrial revolution, is not inherently sustainable. This phenomenon can deliver on global sustainability goals only if underpinned by a so-called digital sustainability approach, thus empowering the role of ICTs in ensuring sustainability.

Moreover, digital technologies have acquired a primary role in individual and community life (Foley and Ferri 2012; Lazar 2017). They both represent an unprecedented opportunity to actively participate and be fully included in society for vulnerable groups at risk of social exclusion, such as persons with disabilities, and a crucial means to provide information to all citizens (Ellis and Kent 2016). The use of digital technology to create augmented reality and to encourage a storytelling process of the scientific knowledge also embodies for the scientific community a new way to interact and communicate with citizens (Wilsdon and Willis 2004; Wynne 2006).

2. The project RISID in a nutshell

The project RISID purports to successfully develop new patterns for promoting the full inclusion and active participation in society of persons with disabilities, along with all citizens, through sustainable ICT solutions. Moreover, special attention is dedicated to the key role played by accessible digital technology in actively involving relevant stakeholders in a mutual exchange of opinions and information with the scientific community, thus creating new ways to communicate and interact between society and science to successfully address effective societal needs.

The development of the digital tool named "SmartInclusion@unipv" (SI@), which is one of the outcome of the project, is presented as a case study of sustainable ICT.

2.1 The App SmartInclusion@unipv (SI@) as a case study

"SmartInclusion@unipv" (SI@) is a smartphone app working on iOS which puts into operation an innovative, inclusive, sustainable and economic digital technology within the ancient courtyards of the University of Pavia. Thanks to a set of Bluetooth beacons (a class of Bluetooth low energy devices that broadcast their identifier to nearby portable electronic devices) positioned within the courtyards of the Palazzo Centrale of the University, the app enables students and researchers with blindness or low vision to move independently in areas where both GPS and Wi-Fi connectivity is very poor or absent due to structural/ architectural limitations of the ancient building.

To date, the digital tool SI@ has been developing as a pilot project under a first phase of

implementation with basic functionalities under the research project «Building an Inclusive Digital Society for Vulnerable Persons: The Role of Social Media Tools in a Disability Human Rights Perspective» (hereafter, project BIDS), financed by the University of Pavia under the call Blue Sky Research Project 2017. The app in the pilot project version works in iOS, as this is the operative system commonly used among persons with blindness or low vision due to its accessibility features.

However, SI@'s functionalities will be further implemented during the project RISID in order to provide multiple services. In the first instance, new pathways will be developed adding numerous beacons to cover the main points of interests of the Palazzo Centrale of the University. In addition, new functionalities will be implemented on the basis of the preferences collected through surveys and brainstorming studies.

The ambition is to provide multiple services and tackle the need of different users – with and without disabilities – passing by the University's courtyards. In this respect, the digital tool could be developed to meet the needs of students (information on the location and timetable of classes, exams, libraries and other services), visiting researchers (information on the location of venues of conferences), tourists (artistic and historical information of the courtyards), and the whole community (information improving the safety, such as alerts on the work in progress within the courtyards, on barriers and eventual deviations on the journey). Finally, a version of SI@ compatible with Android will be released, in order to ensure the major spread of the mobile app to all the potential users.

3. Conclusion

The App SI@ will be used to implement the accessibility of the courtyards of the Palazzo Centrale of the University of Pavia and to effectively share scientific knowledge, thus communicating in a simple and captivating way – through a mobile app – the research activities carried out into the University. The mutual exchange of ideas and synergies between the society and the scientific community will also be ensured by implementing surveys and questionnaires via the app.

At the end of the project RISID, this tool will remain available for all researchers, students and the local community, as it will be used by the University as an asset to connecting the scientific community with society through a mobile app, giving free accessibility to physical and digital new spaces

References

Ellis K., Kent M. (2016), Disability and social media: Global perspectives, Taylor & Francis.

Foley A., Ferri B.A. (2012), Technology for people, not disabilities: ensuring access and inclusion, Journal of Research in Special Educational Needs (12) pp 192 ss..

Lazar J., Stein M.A. (2 017), Disability, human rights, and information technology, Philadelphia University Press.

Ricci C. (2019), Building an Inclusive Digital Society for Persons with Disabilities. New Challenges and Future Potentials, Pavia University Press.

Wilsdon J., Willis, R. (2014), See-through science: Why public engagement needs to move upstream, Demos.

Wynne B. (2011), Public engagement as means of restoring trust in science? Hitting the notes, but missing the music, Community Genetics, 2006, pp 211 ss

Authors

Silvia Favalli - silvia.favalli@unipv.it
LPost-doctoral research fellow (assegnista di ricerca) in International Law at the Department of Political and Social Sciences of the University of Pavia; P.I. of the project RISID

Flavio Ceravolo - flavioantonio.ceravolo@unipv.it
Assistant Professor in Sociology at the Department of Political and Social Sciences of the University of Pavia

Matilde Ceron - matilde.ceron@unipv.it
Post-doctoral research fellow (assegnista di ricerca) in Economics at the Department of Political and Social Sciences of the University of Pavia

Anna Facchinetti - anna.facchinetti@unipv.it
Research fellow (borsista di ricerca) in International law at the Department of Political and Social Sciences of the University of Pavia

Giulia Melis - giulia.melis@unipv.it
Research fellow (borsista di ricerca) in Sociology at the Department of Political and Social Sciences of the University of Pavia

Vittorio Pampanin - vittorio.pampanin@unipv.it
Fixed-term research assistant (RTD-A) (ricercatore) in Administrative Law at the Department of Law of the University of Pavia

Marco Porta - marco.porta@unipv.it
Associate Professor at the Department of Electrical, Computer and Biomedical Engineering of the University of Pavia

Beatrice Rabai - beatrice.rabai@unipv.it
Research fellow (borsista di ricerca) in Administrative Law at the Department of Law of the University of Pavia

Carola Ricci - carola.ricci@unipv.it
Associate Professor in International Law at the Department of Political and Social Sciences of the University of Pavia

Francesco Scervinii - Francesco.scervibi@unipv.it
Associate Professor of Economic Policy at the Department of Political and Social Sciences of the University of Pavia