

BIG DATA IN HEALTHCARE AND SOCIAL SCIENCES:

WAP Madrid & Bip4Cast



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Abstract.-

Healthcare is increasingly turning to big data and their analytics, to help understand patients and the context of their illnesses in more detail. Industry leaders are exploiting big data to reduce cost, increase efficiency and improve patient care. Next steps are about improving patient life using predictive analytics and prevention. Social sciences are very much related with healthcare and both areas develop in a parallel way. Medical and social information databases are actually increasing at every moment but they lack a methodology to gather the information and sometimes are unconnected. The trend is to learn as much as possible about every patient by monitoring signs of illness at early stages. In this way, treatments are far simpler and less expensive.

Collected data are also used by the citizens and governments. Smartphone apps have been the starting point to big data in healthcare. Apps measuring how much you walk in a day, count calories, plan your diet and much more. One example is Walking People or WAP, which is a social network system developed by GRASIA/G-TeC in collaboration with Madrid City government in healthy programs (<http://www.madridsalud.es/wap/>). WAP is running on smartphones and tablets and it is used to encourage participation and manage citizen enrolment. Participants are assigned to a walking group. The software tool is controlled by each Health Center and it provides several functionalities and information to doctors and users.

Data can be shared with doctors who will use them as input for diagnostic aid systems following the dogma 'Prevention is better than cure'. One example is Bip4Cast project which deals with bipolar disorder. Bipolar disorder often leads to periods of sick leave and close attention, thus causing economic and social problems in work and family environments. Most patients suffer crises that can be avoided through early prediction. Common characteristics, identified as patterns of behavior, add valuable information to the study. The dynamic analysis of diverse data monitoring with accelerometers and smartphones are an adequate complement to the data used in previous studies. For predicting the crisis of bipolar disorder, a combination of machine learning algorithms are also developed into a computer-aided diagnosis (CAD) system.

In this presentation, WAP Madrid and Bip4Cast projects are shown as examples of technology application of the data collecting and use evolution within the Big Data era.

Short bio.-

Victoria López is Associate Professor at Computer Architecture department of Complutense University in Madrid, Spain. She has received her PhD in Computational Mathematics and Artificial Intelligence from Polytechnic University of Madrid. She has also received her bachelor degree in Mathematics from Complutense University of Madrid.

She serves as head of the G-TeC research group at Faculty of Informatics at Complutense University in Spain. Her research interests are Big Data in Healthcare and Social Sciences. In this way, she served as head of WAP Madrid Salud Project (among others) and at present, she is leading the project Bip4Cast (a big data integration for prediction of a crisis of bipolar patients <https://bip4cast.org/>). She is also head of the analytics group G-TeC within the project SocialBigData-CM devoted to monitoring and analysis of social change from Big Data (<http://socialbigdata.transyt-projects.com/objetivos/english/>).