

# Mood Monitor: telemonitoring platform to assess mood disorders

## Mobile app and wearable sensor to remotely assess mood status and empower patients with mood disorders

*Life Supporting Technologies designed and developed a solution for the assessment and prediction of the mood status of persons with unipolar (e.g. major depression) and bipolar disorder. The system gathers subjective and objective data to estimate the evolution of the mood status; the patient is empowered by a set of tools that improve the therapeutic alliance with the health professional.*

Technology solution supported by the Technical University of Madrid

### Technology solution

The solution provides a tools to improve the therapy and the follow up of patients with unipolar and bipolar disorder. The end users use a Smartphone application (Android based) to record voice information (speech ratio, harmonies of the voice), report the mood status (questionnaires, mood scales), the medication intake and the daily habits (diary). The phone is connected with a wearable sensor that during the day monitors the level of energy and during the night the sleep quality. The concept provides support to the patient by providing a set of useful tools to communicate with the therapists, check the medication, mood charts and reminders. The Smartphone app also provides psycho education support (via personalized messages, educational content and goal settings support). A Web cloud service provides the access to this information to the health professionals and they remotely assess the mood status and prevent relapses or mood swings. The powerful visualization tools, the prediction tools and the alert systems enrich the user experience of the professionals to have a more clear understanding of patient situations. The solution is fully flexible and adaptable for several typologies of subjects: every module (e.g. medication tools, sleep monitoring, questionnaire) could be customized according to patient's condition.

*"State of the art solution to assess mood disorder; a cost benefit solution to improve the therapy alliance, the disease management and the patient empowerment"*



### Areas of application

- Health: personalized health system for affective disorders; tele psychiatry; eHealth, mHealth

## Market demands

- The major mood disorders, unipolar (UP) depression and the bipolar (BP) disorders (both BP I and II expressions) have high lifetime prevalences and impact on individuals' ability to function. In 2012, the World Health Organization (WHO) ranked depression as the leading cause of mental health disability world-wide, affecting some 121 million people.
- Much of the economic burden of mental illness is not the cost of care, but the loss of income due to unemployment, expenses for social supports, and a range of indirect costs due to a chronic disability that begins early in life.
- Approximately 20.9 million American adults, or about 9.5 percent of the U.S. population age 18 and older in a given year, have a mood disorder [Archives of General Psychiatry, 2005].
- E-health services provide treatment and support to people with mental health disorders through telephone, mobile phone, computer and online applications, and can range from the provision of information, peer support services, virtual applications and games, through to real time interaction with trained clinicians. The treatment of mental health disorders through traditional techniques such as cognitive behavioral therapy has been shown to be effective in an online environment for high prevalence conditions.

*"There is medical evidence of benefits of tele psychiatry and monitoring programs to promote and support mental wellbeing"*

## Market potential

### Spanish health care

- Chronic depression accounts for 5.9% of chronic or long-term diagnosed by a doctor in the adult population in 2011-2012, accounting for 5.49% of the problems that have limited daily life in total the population in the same period. On the other hand, 14.58% of the population over 15 years reported feeling from mildly to extremely anxious or depressed [INE].

### Mobile application (mental wellness app)

- The exponential grow of the Smartphone technologies opens new opportunity to build a new sustainable model of health care. GSMA predicts that in future mobile solutions of health can have a market of 6.9TR \$ and save globally 400BN \$ in the OECD countries [GSMA Mobile economy 2013].

## Competitive advantages

- The system has been designed and tested involving real users.
- Small clinical trial (n=30) to measure the benefits of tele monitoring and remote mood assessment.
- Approval of ethical comité of Italy, Swiss and France
- High level of personalization of the telemonitoring routine.
- Personalization of the notifications / alarms for patient.
- Full data visualization on both side (patients and professionals).
- The only solution on the market that offers a a technology which enrich the patient's information by using a wearable sensor.

## References

- 8 years of experience in the design, development and validation of telemonitoring systems
- This research was partially founded by the EU founded project PSYCHE (IST 247777).

## Development stage

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

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