ASSISTIVE TECHNOLOGY FOR PEOPLE WITH PROFOUND INTELLECTUAL AND MULTIPLE DISABILITIES

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Personalized intelligent platform enabling interaction with digital services to individuals with profound intellectual and multiple disabilities.
Financing: EU-Project supported by the Horizon 2020 program
Period: 01/2018 – 12/2020
Consortium: International & interdisciplinarity

Objectives: Design and develop an ICT platform that enables persons with PIMD to use digital applications and services that:
• can enhance the quality of their life
• increase their ability to self-determination
• enrich their life
Target Group

People with profound intellectual and multiple disabilities (PIMD):

- Profound intellectual disability
- Adaptive behaviour clearly below average

In addition:

- Motor impairment
- Sensory impairment
- Medical problems (e.g. epilepsy)

Communication:

- Usually no verbal language
- Mostly on a pre-symbolic level
- Often use of individual and unconventional behaviour signals

Extensive support needs & dependency
Concept of INSENSION Platform

Approach: Technology-supported responsive environment

• Analysis of behaviour signals and context factors
  a) Questionnaire for proxies
  b) Recognition Technologies
• Identification of potential needs for action
  → Use of digital applications and services
Application Use Cases for the INSENSION System

Definition by means of Focus Group Workshops
Definition of Application Use Cases: Focus Group Workshops

<table>
<thead>
<tr>
<th>Aim:</th>
<th>Defining those situations, which are most challenging for people with PIMD and their caregivers</th>
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</thead>
<tbody>
<tr>
<td><strong>3 workshops:</strong></td>
<td>Heidelberg (Germany), Poznań (Poland), Kraków (Poland)</td>
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<tr>
<td><strong>Participants:</strong></td>
<td>Relatives (e.g., parents), professional caregivers, ICT specialists</td>
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# Overview of the Focus Group Workshops

<table>
<thead>
<tr>
<th>Workshop</th>
<th>Focus scenarios</th>
<th>Participants</th>
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<tbody>
<tr>
<td>III. Kraków, Poland (11.02.2019)</td>
<td>Impact of <strong>external factors</strong> on a person's mood</td>
<td>Relatives: 4, Professional Caregiver: 4, ICT specialists: 2, Sum: 10</td>
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</tbody>
</table>
Focus Group Workshops - Phases

**Persona**
- Who are we designing for?
- How old are they?
- What do they like?
- How they spend their days?
- What are their interests?

**Problem**
- What are the areas of intervention?
- What are the needs and daily challenges?
- What kind of problems do our users face on daily basis?
- Creating the most fantastic and absurd ideas as possible. No filter. Just wonderful, raw ideas.
- This stage is about "why not?"
- What do we want?
- What is the solution?
- How do we imagine the solution?
- What are the benefits of applying this solution?

**Dreamer**

**Realist**
- How can we apply this idea in reality?
- What is the action plan?
- What is the timeline?
- How to evaluate the idea?

**Critic**
- What could be wrong with the idea?
- What is missing?
- Why cannot we apply it?
- What are the weaknesses in the plan?

AAATE 2019
Dreams

- Connection to weather (history & forecast)
- Connection with smart home
- Connection to a calendar
- Entering "calmers" (e.g. music)
- Standard advices/recommendations for caregiver
- Interpretation of behaviour/behavioural recommendation
- Digital dictionary
- Person-centeredness
- Individual care and assistance by robot
- Laserpointer which shows viewing direction

- Calming music
- Pain detection (source of pain)
- Temperature regulation
- Motionlessness detection (apnea)
- Pre-seizure state detection (epilepsy)
- Infection symptoms detection

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- How can we apply this idea in reality?
- What is the action plan?
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Dreams

- Communication
  - Connection to weather (history & forecast)
  - Connection to a calendar
  - Entering „calmers“ (e.g. music)
- Multimedia-Player
  - Calming music
  - Temperature regulation
  - Motionlessness detection (apnea)
- Pain detection (source of pain)
- Pre-seizure state detection (epilepsy)
- Infection symptoms detection
- Smart home + robotic assistance devices
- Digital dictionary
- Interpretation of behaviour/behavioural recommendation
- Individual care and assistance by robot
- Laserpointer which shows viewing direction
- Standard advices/recommendations for caregiver
- Person-centeredness

Critic

- What could be wrong with the idea?
- What is missing?
- Why cannot we apply it?
- What are the weaknesses in the plan?
Conclusion

- Based on the findings and ideas of workshops:
  → 3 technological application use cases
  - Communication
  - Multimedia-Player
  - Smart home + robotic assistance devices

- Aim of each application → remedy in challenging scenarios, increasing the self-determination and improving the quality of life
- Inclusion of secondary users plays an important role (e.g. in terms of usability)
Thanks for your attention!

Question, comments, remarks...?

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Literature