Technical Requirements of a Social Networking Platform for Senior Citizens

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WG MEDIS – Medical Information Systems

MIE2012 Pisa
AAL - Ambient Assisted Living

- AAL aims to
  - enhance the quality of life of older people and
  - strengthen the industrial base in Europe through the use of Information and Communication Technologies (ICT)
- Potential of up to 1 million work places (Germany)
- Costs for homecare in Germany were 17.6 billion € in 2004
- Global telemedicine market is expected to grow by more than 100 percent in the coming five years
Activities under the AAL Joint Programme
Loneliness and social isolation of older people

10% of older people feel always or very lonely

The percentage of the population who feel isolated and are therefore, at risk of loneliness is significantly larger:

- 12% of older people feel trapped in their own home
- 6% of older people leave their house once a week or less
- 17% of older people are in contact with family, friends and neighbours less than once a week and 11% are in contact less than once a month
- Over half (51%) of all people aged 75 and over live alone
- 36% of people aged 65 and over in the UK feel out of touch with the pace of modern life and 9% say they feel cut off from society
- Half of all older people (about 5 million) say the television is their main company

Source: www.campaigntoendloneliness.org.uk
Join-in supports elderly people by

• helping them to maintain and set-up contacts
• offering people -threatened by loneliness and social exclusion- activities and means to
  – stay part of a social community
  – participate in social activities
  – have fun
• encouraging communication
• inciting physical activities
Join-in develops and offers

- **communicative multiplayer computer games** stimulating the cognitive and mental capacities of the elderly
- **exergames adaptable to the needs of the elderly** and enabling them to compete with others
- **moderated exercising** and exercises supporting physical fitness and dexterity
- **a social networking platform** offering simple-to-use contact and communication facilities
Join-In Social Platform Architecture

User Environment
- TV + Settop-Box
- TV + PC
- PC
- Tablet Device
- Touchscreen PC
- Wireless Gaming Controllers + Motion Sensors

System Environment
- System services
- Social services
- Game services
- Authentication
- User Profiles
- Games
- Security Privacy
- Friends Groups
- Exergames
- Content Management
- Video Chat
- Moderated Exercises
- Calendar

Browser Interface

Internet
Unser Involvement

How can elderly people be attracted to ICT solutions?

Trust

Adequate Technology

Individual Needs

Benefit

Main Reasons for believing that technology is a curse:
- difficult to learn
- too complex for ordinary persons

Technology should adapt to the persons needs

- social inclusion
- fun
- mental/health benefit (prevention, maintain autonomy)
- security through connection with family and friends
- connection to homecare neighbourly help

Acceptance of digital media and social platform
User Groups Munich

Potential AAL users are a very heterogeneous group
Join-In involves different types of users

- **Senior Club** Lebensfreude
  Most of the participants are over 75 years
  1/3 owns a TV that is younger than 2 years
  1 out of 10 had played a video game before
  8 out of 10 have never used a computer

- **Dancing group**
  More active and younger seniors

- **Serial Focus group**
  Experts from different areas (church, neighbourly help, home care, directors of the clubs for elderly)

- **Home care**
  Mostly homebound seniors

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**Age Distribution Seniorclub**

- 66-75: 6
- 76-85: 13
- 86+: 9
- K.A.: 1

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Helmholtz Zentrum München
German Research Center for Environmental Health
Results from User Involvement

• Applications must be beneficial
  • Social Inclusion
  • Supporting physical health
  • Supporting mental health

• Communication is most important

• Known games or known elements facilitate access

• Fun at gaming helps overcome fears towards new technologies

• Speed and complexity of most technological solutions are discouraging
## Join-In High Level System Requirements I

(Excerpt)

<table>
<thead>
<tr>
<th>Id</th>
<th>Overall</th>
<th>Pri</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>The system must be <strong>easy-to-learn and self-explanatory</strong> in use for an average senior user (few steps, intuitive menus, etc.)</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>The system must make <strong>consistent use of terminology</strong>, abbreviations, formats, titles</td>
<td>1</td>
</tr>
<tr>
<td>1.3</td>
<td>The system must present the social tools, games and exergames in an <strong>integrated and uniform view</strong> to the senior user</td>
<td>1</td>
</tr>
<tr>
<td>1.8</td>
<td>It must be possible to <strong>include audio</strong> elements (music, ambient sounds, etc)</td>
<td>1</td>
</tr>
<tr>
<td>1.10</td>
<td>The <strong>system must be scalable</strong> (accommodate future increases in the number of users, database sizes and processing loads with minimal degradation of performance, and without having to be redesigned or reimplemented).</td>
<td>2</td>
</tr>
</tbody>
</table>

### Senior

<table>
<thead>
<tr>
<th>Id</th>
<th>Overall</th>
<th>Pri</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>The system must <strong>address hearing impairment</strong> of senior users.</td>
<td>1</td>
</tr>
<tr>
<td>2.2</td>
<td>The system must <strong>address reduced fine motor skills</strong> of senior users.</td>
<td>1</td>
</tr>
<tr>
<td>2.3</td>
<td>The system must <strong>address visual limitations</strong> of senior users (e.g., adjust contrast)</td>
<td>1</td>
</tr>
<tr>
<td>2.4</td>
<td>The system must <strong>support multilingual environments</strong>.</td>
<td>1</td>
</tr>
<tr>
<td>2.5</td>
<td>The system must be <strong>affordable</strong> for the average European senior.</td>
<td>2</td>
</tr>
<tr>
<td>Id</td>
<td>Social tool</td>
<td>Pri</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>3.1</td>
<td>A user must be able to view another user's <strong>on-line open public profile and game status</strong></td>
<td>1</td>
</tr>
<tr>
<td>3.2</td>
<td>A user must be able to <strong>chat to fellow on-line users.</strong></td>
<td>2</td>
</tr>
<tr>
<td>3.7</td>
<td>The social tools must support a search functionality so a user can <strong>look up a friend</strong>.</td>
<td>1</td>
</tr>
<tr>
<td>3.9</td>
<td>Some <strong>media sharing with other users</strong> must be possible.</td>
<td>2</td>
</tr>
<tr>
<td>3.10</td>
<td><strong>Moderators</strong> must be enabled to create user-groups and invite users to take part in group activities.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>The social tools must support a <strong>videoconference system</strong>.</td>
<td>2</td>
</tr>
<tr>
<td>Game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>The system must provide <strong>easy access to the games and exergames</strong>, like start/stop, storage of gaming points, log of progress, etc</td>
<td>1</td>
</tr>
<tr>
<td>User environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>The user environment must allow for <strong>“alternative”</strong> (non-keyboard, non-mouse) <strong>input devices</strong> (e.g. voice or remote control).</td>
<td>1</td>
</tr>
<tr>
<td>5.3</td>
<td>The <strong>screen</strong> must be easily <strong>readable under different lighting conditions</strong>.</td>
<td>2</td>
</tr>
</tbody>
</table>
Join-In User Environment Technologies

- Games are **webbrowser based** and using HTML5
- Games support **Kinect and Hillcrest Scoop** (free-space pointing device and accelerometer)
- **Video and audio integration using HTML5** and JavaScript (without requiring additional plugins)
- **Set-top boxes** (for HDTV sets) and All-In-One PCs will be used (at the German pilot site)
- **Social networking platform** based on ELGG

**Ease-of-use**, simplicity and accessibility are required
Social Cognitive Game: Overview

• Based on the card game commonly known as ‘concentration’ or ‘memory’
  • Choice of the users
• A turn-based multiplayer game involving two players
  • A set of facedown cards is visible to both players
  • Each player must match a pair by turning two cards face up
  • Cards remain face down unless matched
  • Successful matches are rewarded with another turn
  • The game ends when all pairs are matched
• In-progress
  • Single player mode for solo play / practice
# Social Cognitive Game: Requirements (Excerpt)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Top 10 requirements</th>
<th>Supported in current build</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The possibility to play cooperatively and competitively</td>
<td>Partially</td>
</tr>
<tr>
<td>2</td>
<td>Layout graphics should be adequate for elderly</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Communication with others</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>The rules should not be complicated</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>The possibility to choose difficulty and speed levels for each person</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Should have only one centre of attention no distractions</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Should be beneficial for the mental fitness</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>The possibility of following progress</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Should allow for goal setting</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Must allow pauses</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Social Cognitive Game: Special Features

- Special features
  - Integration with social platform
  - Uploading of custom images by users for use in-game
  - Cooperative multiplayer mode
  - Adaptable difficulty levels
  - Collection and storage of cognitive metrics
  - Artwork and localisation
Exergame: Overview

• The goal of the walking game is to motivate a user to exercise frequently
• It is based on the exercise step aerobics where members of the group exercising must walk in time with a set rhythm
• The Microsoft Kinect motion camera is used to track each user’s movement.
• The success of the game may be measured by evaluating motivation, usability, social connectedness and increase in fitness
• In order to provide an appropriate challenge for each individual user the game will implement a Dynamic Difficulty Adjustment system (DDA)
• The system will adjust the game’s difficulty in real time to suit a user. The goal of this system is to keep a user in the flow channel for as long as possible
Games and Exergames

In-game screenshots
Summary

- Challenges in introducing a social networking platform for homebound elderly
  - Reservations regarding new technology
  - Physical disabilities
  - Heterogenity of the user group
- Technical requirements were collected
  - Ease of use is central
  - Adaptability to different capabilities of the users is needed
  - Accessibility is a major concern
- User Support is vital
  - Moderator will assist group activities (e.g. exercising, gaming)
- User testing at pilot implementations will start in February 2013
Thank you for your attention

www.join-in-for-all.eu