Health Kiosk
Autonomous Collection of Health Information

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This presentation is a result of the project NanoSTIMA Macro-to-Nano Human Sensing: Towards Integrated Multimodal Health Monitoring and Analytics, NORTE-01-0145-FEDER-000016, supported by Norte Portugal Regional Operational Programme (NORTE 2020), through Portugal 2020 and the European Regional Development Fund.
Motivation

- Lack of resources in rural areas
- Medical facilities with higher demand than offer
- Elderly communities
- Screenings for some types of diseases
- Reduction in price of Personal Health Devices
- Higher variety of devices
- Low cost of assembling a system
Overview of the System

- Modular system capable of handling different health devices
- Features such as printing results, citizenship card reading, QR Code
- Internationalization of the system, via text and voice.
Usage Flow of the Application

- Three main stages
  - User Personal Data Collection
  - Exam Data Collection
  - Summary of Collected Data
- The flow changes according to the configuration of the system
Personal Health Devices

- Different types of devices
  - Continua Alliance Certified and Noncertified

- Different types of communication
  - Assure compatibility with the maximum number of devices
  - Easy integration of new devices
Web Components

- Allow the creation of reusable components
- Increase the modularity of the application
- Eases the addition/removal of components
- Eases future development
Internationalization

- Pre-Generated voices using Text-to-Speech technology
- Use of i18next\(^1\) framework allows an easy integration of new languages
  - Based on JSON files for each language
  - Each text string has a pair ID/value for each language

\[
\{ \\
  "welcome_title": "Bem Vindo ao Quiosque de Saúde"
\}
\]

\[
\{ \\
  "welcome_title": "Welcome to the Health Kiosk"
\}
\]

\(^1\)http://i18next.com
QR Code

- Contains all collected data
- Adds an entry to the user’s calendar
- Can be used with other purpose

- Health Kiosk smartphone application

<table>
<thead>
<tr>
<th>Oximetry:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen Level (SpO2): 98</td>
</tr>
<tr>
<td>Heart Rate (BPM): 79</td>
</tr>
<tr>
<td>Blood Pressure:</td>
</tr>
<tr>
<td>Systolic Pressure (mmHg): 109</td>
</tr>
<tr>
<td>Diastolic Pressure (mmHg): 70</td>
</tr>
<tr>
<td>Heart Rate (BPM): 62</td>
</tr>
<tr>
<td>Weight:</td>
</tr>
<tr>
<td>Weight (Kg): 74.9</td>
</tr>
</tbody>
</table>

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Smart Card Reader Identification

- Enables automatic collection of data
- Avoids human error when introducing personal data
- Only public data is available
- Can help creating a user profile
  - Personal data and a photography are available in the card
Configuration of the System

- Currently done using a configuration file
  - In the future is going to be made using a Graphic User Interface

- Feature Selection
  - Language
  - Identification Method
  - User Data
  - Exams Details
  - Inactivity Reset Time
  - Printer, QR Code, Sound...
Web Real Time Communication

- Direct communication between the Health Kiosk and a Health Office
- Establish a video conference between both ends
- User can clarify any doubts
- Established communication is bidirectional:
  - The health professional can receive data from the health kiosk in order to assess the patient.
  - The status of the health kiosk can be remotely changed by the health professional.
Application Interface

Thank you for using the HealthLink.

User Number: 481586234
Height: 175
Age: 25

<table>
<thead>
<tr>
<th>Exam</th>
<th>Parameters</th>
<th>Read Value</th>
<th>Normal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>O2</td>
<td>Oxygen Level (%)</td>
<td>98</td>
<td>Higher than 95</td>
</tr>
<tr>
<td>Heart Rate (BPM)</td>
<td></td>
<td>63</td>
<td>Between 60 and 110</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>Systolic Pressure (mgHg)</td>
<td>100</td>
<td>Lower than 130</td>
</tr>
<tr>
<td></td>
<td>Diastolic Pressure (mgHg)</td>
<td>79</td>
<td>Lower than 80</td>
</tr>
<tr>
<td>Weight</td>
<td>Weight (kg)</td>
<td>74.6</td>
<td>Between 77 and 77</td>
</tr>
</tbody>
</table>

Blood Pressure - Instructions

5. Tighten the strap around your arm.

Scan the QR Code to access more information.

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Future Work

● Integration of new Devices
  ○ Glucometer

● Usability Testing
  ○ Department of Computer Science, Faculty of Sciences, University of Porto
  ○ City Hall of Valongo

● Electronic Health Record
  ○ Integrate collected data into an electronic health record.
Questions?