Smart Refrigerator

The first device of the smart kitchen - Seesam

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1. Introduction:

We are both third-year students from 'Artesis Plantijn Antwerp' in Belgium. When we saw the opportunity to go on Erasmus to Oulu in Finland and do our Bachelor-project there we did everything to make it possible.
Here we are, and we are very thrilled about the project we got!

2. The project:

The project we are doing is a daughter-project of a bigger project of two years to put some intelligence into the ordinary kitchen (Seesam). We have the privilege to be the first two students to contribute to this project.

As stated in the title, we will delve us into the smart refrigerator!
The main idea is to make a refrigerator that will know who's using it, what he may and what he may not eat and what's in the refrigerator. The refrigerator will know this based on the current properties of the user (scale for weight, input, BMI-calculator,…).

3. Github:

To maintain the structure, workflow and to easily monitor the project we have made a repository on Github for this project. Our request to make it private should be accepted soon. You can find the repository on:
https://github.com/TomMampaey/Smart-Fridge.git

Note: If you have a git-account we can add you to the view-members.

4. The idea's and brainstorm:

- User recognition:

  - **Fingerprint reader in handheld:**

PRO	CONTRA
Very unique (for each person)	You have to touch something
Reliability	Difficult with wet fingers
	Waiting-time

  - **Active RFID key-hanger or card:**

PRO	CONTRA
Detection on distance	Physical object
Multiple use and handy	Can mix up multiple users
Cheap	

  - **Kinect face-recognition:**

PRO	CONTRA
Challenging	Delay(?)
Automatic recognition	Height of camera
International team-work	Complex

  - **Face-recognition Raspberry-Pi:**

PRO	CONTRA
Automatic recognition	Delay(?)
Cheap	Height of camera
	Reliability

  - **Voice-recognition:**

PRO	CONTRA
Accessibility	Complex
Cheap	Reliability
Fun	

  - **Motion-detection:**

PRO	CONTRA
Energy-saving (only on when motion)	No direct user-recognition
Cheap	Reliability
Easy	

- Product recognition and recommendation:

  - **Barcode-reader:**

PRO	CONTRA
Existing databases	Finding a fast way to scan it
	By hand
	Takes time

  - **NFC-tag:**

PRO	CONTRA
Wireless	Attach on the products/tray
Stickers are cheap	Reader on every place
Place-independent	

  - **Mechanical detection/hatches:**

PRO	CONTRA
Overview and organization	Moving parts
Reliability	Expensive
Not possible to take other product	

  - **LED's/ LED-strip**

PRO	CONTRA
Clearly what product it is	User can take other products.
Colors for good and bad	
Fancy	

- Health-detection:
    - **Integrated scale:**

PRO	CONTRA
User-assuredness	Big surface-area
Possibility to calculate BMI	View
No extra action required (for user)	

    - **Personal point-system (based on earlier snacks):**

PRO	CONTRA
Motivating for users	Requires many properties of user
Competitive	
Possibility to turn off feature	

    - **BMI-calculator:**

PRO	CONTRA
Easy calculation	Requires (many) properties of user
User can compare to average	Frustrating
Possibility to turn off feature	

- Communication/Platform:
    - **Raspberry Pi:**

PRO	CONTRA
Performance	Limited hardware ports
All-in one computer	
Internet-connection	

    - **Arduino:**

PRO	CONTRA
Perfect test-device	No internet-connection
Many possibilities	Limited hardware-set
Cheap	

    - **Wi-Fi and Ethernet (LAN):**

PRO	CONTRA
Connected devices	Security
Software updates	
Monitoring	

    - **Bluetooth:**

PRO	CONTRA
Peer-to-peer	Not always reliable
Not connected to the internet	Possible delays
	Can only connect 2 devices at once

5. Estimated Gantt-chart:

Subject	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Documentation:										
Concept-report										
Gantt-chart/Project-planning										
Brainstroming										
Comparing possibilities										
Hardware:										
Research (target)										
Experimenting										
Features										
Collectting components										
Powersupply										
Communication										
Arduino										
Raspberry Pi										
User-recognition										
Testing										
Schematic-design										
PCB-desgin										
PCB-manufacture										
Prototyping										
Error analyzes										
Software:										
Research										
Choosing Language(s)										
User-recognition										
Raspberry Pi										
Features										
Server-side										
GUI										
Final:										
Final integrating Software - Hardware										
Finishing hardware										
Final Report										
Finnishing touth Final Report										

Subject	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
Documentation:										
Brainstroming										
Concept-report										
Gantt-chart/Project-planning										
Comparing possibilities										
Hardware:										
Research (target)										
Experimenting										
Features										
Collectting components										
Powersupply										
Communication										
Arduino										
Raspberry Pi										
User-recognition										
Testing										
Schematic-design										
PCB-desgin										
PCB-manufacture										
Prototyping										
Error analyzes										
Software:										
Research										
Choosing Language(s)										
User-recognition										
Raspberry Pi										
Features										
Server-side										
GUI										
Final:										
Final integrating Software - Hardware										
Finishing toutch hardware										
Final Report										
Finnishing Final Report										

The Annex:

Content:

Will be added soon.

Images:

- Front-page image:
  http://www.revistaexclusiva.com/?p=25851