

Deliverable D1

FREE TO BREATHE

FtB – <https://github.com/AmI-2016/FtB>

Group members

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Vision

Lorem

FREE TO BREATHE is an interacting monitoring system thought for people affected by asthma, with the aim of supporting them and their whole family in their daily lives by making a safe area out of their home. It is studied that main causes of asthmatic attacks are the presence in the air of allergenic substances (such as mites, pollen and mold) and chemical substances (contained for example in cigarette smoke or perfumes) or, on the other hand, wrong ambient conditions: excessive cold to name one.

We imagine a system that works following the four steps of AmI: FtB will analyze everything it can in the room where you decide to install it and will adjust its parameters in order to be beneficial to your health and consequently augment your comfort, it will keep track of the conditions of the external world and will give you tips on how to face it, it will interact with you giving information you may find useful and asking you questions that will allow it to make itself better all alone!

Let's think about how this system will improve your life and the functionality of your house:

- The risk of starting coughing or worse of having an attack because of the substances present in the air will be drastically reduced; it will be FtB's duty to sense the presence of allergenic substances and eliminate them rapidly.
- The room is too cold? Or maybe too hot? Too humid? That could be problematic, but don't worry, you won't have to move a finger, our system will provide to sensible regulations all alone!
- FtB doesn't forget that external climatic conditions are nothing to joke neither, on the contrary it will constantly monitor them through your internet connection and will operate proactive regulations. Plus, it will also provide you tips on how to face the day or going out with low risks!
- Least but not last, we want to tell you this: FtB isn't a cold heartless machine, it is your friend! There's something about asthma you'd like to know? Try and ask him! You're not entirely satisfied with its behavior? Just answer its questions and it will try to adjust itself to match your requirements and desires!

Commentato [FC1]: The contents of this document must be published on the project website, in a clearly identified location (not as linked PDF or similar).

Commentato [FC2]: Vision statement:

-Brief summary of what the system does for the users

-Define the target environment

-Define your users

-Define your stakeholders

-Describe how the environment supports the users, from the user point of view

-What problems need to be solved/tackled

-Benefits for the users and for the ambient

-Absolutely avoid describing the technology or making some technical choices

-Imagine "selling" it to a non-engineer.

Max 1 page, plus pictures (if any)

Aml main steps

Aml step	Description
Sensing	Air composition will be constantly monitored (with focus on detecting the presence of substances which can be considered dangerous for the health of the subject) through ad hoc sensors placed in the room and so will be for temperature and humidity. Plus, sensors placed in proximity of the bed or the desk, which means areas which are among the ones where we generally spend the most of our time in the room, will have the role to detect the incoming of an attack, noticing, for example, excessive cough from the subject.
Reasoning	On the base of what the sensors read, the system will analyse data and detect dangerous situations from which an attack could grow up or, as explained before, the presence of one. Plus, a connection will be established with a reliable weather forecast site, so that data on the external environment will be available too: thanks to that it will be possible to study suitable regulations to internal parameters even before the incoming of a wrong internal condition and useful tips on a right way to face internal and especially external issues will be given to the user in real time.
Acting	If a hot situation is detected during the reasoning phase the system will aim at adjusting the conditions of the room: temperature, humidity, air composition (pushing in fresh air from a safe source and pushing away the bad one). Operations connected with the regulation of environmental parameters will be done in advance of the incoming of a problem if climatic and external conditions will require it, in order to improve users comfort as much as possible. Finally, the system will be given some features it will exploit to communicate with the user in clear, fast and suitable ways every time something useful has to be notified.
Interacting	Every time an anomaly is detected the whole family will of course be informed, via smart phone for example; in particular, if an attack is detected, they will know immediately, being this way able of calling a doctor or to do whatever it will be necessary really fast. However, there is more: the device could be used as a personal assistant which will transform the house in a safe area for everyone, especially for people with allergies. Why? The device will warn you if there is a dangerous situation, but not only: it will also interact with you by giving useful tips on how to face a particular set of conditions it detected or advices on how to face issues connected with usual problems of asthmatic patients. Finally, in order to optimize its future behavior the device will ask you to judge its work through well focused questions and will try to adjust its functions in order to fulfill your desires.

Commentato [FC3]: Describe how the content of the project is developed in the four main steps of all Aml systems.
Be synthetic, one/two sentences per step will be more than sufficient.
All four steps must be well represented in a successful project.

Aml features

Aml feature	Description
Sensitive	The system will be sensitive to many internal conditions of the room where it is placed, as explained before, but also on external conditions and, not to be forgotten, on the user, always monitoring if signs of illness/discomfort are identifiable.
Responsive	User needs will be deeply important; a demonstration of this fact is that the system will always try to act as a friend and a tutor to him: it will cure the optimal conditions of the place he lives in, but it will also give him advices and will try to maximize its comfort through active interaction based on a system of ad hoc questions.
Adaptive	FtB will be able to infer a situational context from environmental sensed and obtained through internet connection data or from the monitoring of user conditions; all of that to properly adapt its behaviour. Also it will constantly regulate itself on the base of what its users think of it or directly ask.

Commentato [FC4]: Describe which Aml features are developed by your project. Be synthetic, one/two sentences per feature are sufficient.
Some features may be more important than others, this is normal and depends on the project.
It is also acceptable that some features are not developed in your specific project.

Transparent	In the limits of the physical dimensions of sensors and components, the system won't be much visible and won't keep a lot of space. A guest who doesn't know FtB is installed should only know of its presence when it will interact with you!
Ubiquitous	This system clearly is replicable in every modern home and can be positioned throughout the whole house, in every room where it is needed: it will only require to be attached to an energy source and an internet connection to operate at its full possibilities.
Intelligent	FtB could also be defined quite the intelligent "guy": it asks questions and adapts itself on the base of your answers, it analyses the data which are given to him and produces tips and advices. Finally, let's not forget that it also knows a few things about asthma that probably not everyone does!

Open issues

The project we're going to try and realize certainly isn't simple: we'll have to describe a highly adaptive system which takes information from many different sources, so that it could prove difficult to interface each one of them in a proper and effective way. A deep knowledge/research on how to interface different technologies and what tools are needed to supervise them will be needed.

Plus, even if we found on the internet devices that could be useful to cover the sensing part of the project, we'll have to obtain them and manage to use them successfully.

For what concerns the final demonstration, if we succeed in getting all the sensors we need we should be able of mounting them in the lab and of recreating hot situations by forcing them, for example by using a huge amount of perfume or a heater in proximity of the ad hoc sensor, in order to test the response of our system.

Commentato [F5]: The goal of this section is to keep track of the main problems that need to be discussed and solved. You should organize a section of the web site with a work-in-progress of this information, that will change throughout the project lifecycle.