

ISP 2023 Case Study 1*

Smart home automation assistants

1 Description

OFD is a company that has a long successful track-record of designing and building white-label home appliances, then sold under different private labels through various retailers. Their products include kitchen ware, like blenders, barbeques, ovens, and dehydrators, but also general household appliances, like vacuum cleaners, washing machines, and even TV sets and lawn mowers.

Given the recent success of “smart” home appliances and the ubiquity of wifi at home, OFD wants to enter the smart home automation market. Not only do they expect skyrocketing sales figures, but even the possibility to drastically reduce cost and complexity of the devices: given the availability of cheap wifi networking cards and elastic cloud services, the entire control of the devices can be offloaded to the cloud and requirements for on-device hardware drastically reduced.

The corresponding cost reduction even outweighs introduction of new, cheap extensions, like proximity sensors, thermometers, cameras for environment awareness and facilitating the required connection to the local wifi by simple QR codes, and others. This move also allows for ever extending smart functionality to be offered by maintaining the software at a central point in the cloud rather than having to update the software on the device (let alone changing hardware, in the past).

Rudimentary control remains, the devices are still equipped with simple on/off buttons, which, pushed twice, can also be used to start the very basic function (blending, 40°C washing with tumbling, general mowing or vacuum cleaning). The users are informed in the handbooks that using this button implies consent that sensors are turned on and the device be controlled through the cloud, as the simplified local hardware does not allow for stand-alone use. Control through the cloud allows for keeping digital twins of each device available, so customers can be informed about

* Wed Jun 14 14:43:44 2023 +0200 / 93d317a / case-study-1.md

potential problems with the device (a front wheel of the lawn mowing robot got stuck, some blades need sharpening), and potential upgrades. Planned obsolescence could further increase sales, as the functionality of older devices could gradually be restricted, to drive purchase desires.

OFD realizes that human interfacing with these devices will be difficult, but their consultants explain how to turn a disadvantage into an advantage, by offering a free mobile app for download that provides tips and tricks around the appliances, and also implements control of the more intricate functions, for which the very simple one-button interface on the device does not suffice. This brings OFD to a secondary commercialization opportunity: trading entirely anonymous collections on user data exchanges.

OFD has heard of some security incidents, where smart home data were lost by smart home vendors ¹, but is optimistic that will not face such incidents, as it has hired a small team of very competent IT security experts. It also does not really collect all that much information: They collect contact and billing information of their customers, data relating to wifi traces, data relating to video recordings necessary to interpret the environmental conditions of the customers' devices and to allow for gesture-based interaction, as well as some data collaterally collected by the devices.

OFD is also aware of the special requirements in Europe, regarding the protection of privacy and of personal data of customers, but argues that first, the data collection is necessary for the performance of the contract (those devices don't work without the cloud, after all!), and that the customers have given consent to the processing of their personal data when turning on the devices for the first time.

OFD has also learned of some technologies, which may allow for anonymization and privacy-preservation, which they ponder implementing to enhance the security they offer and exploit also as additional marketing cloud.

OFD hence contracts you to argue their legal standpoint, analyze social and ethical concerns, and discuss technical possibilities of deploying their new business model at a broad scale, especially regarding their customers in Europe.

¹ <https://www.technologyreview.com/2022/12/19/1065306/roomba-irobot-robot-vacuums-artificial-intelligence-training-data-privacy/>

2 Tasks

- Analyse the case study from the legal and the societal perspective. Is personal data being processed, and if so, is this lawful? What extreme forms of personal data could be collected using OFD smart home appliances?
- What if visitors enter a house with OFD smart home appliances? What further ethical considerations you think are relevant?
- Analyse how much information about and control over the functioning the OFD home appliances their owners have.
- Could this be improved somehow? Give concrete suggestions.
- What other measures could OFD deploy to reduce the privacy risks associated with using their appliances?