



UNIVERSIDAD DE GRANADA

Living in a Smart Global Village: a Data Collection Story

Daniela Popescul, Alexandru Ioan Cuza University, Iasi, Romania - rdaniela@uaic.ro

Background

- nowadays, our lives are recorded by various new companions as smart wearables (e.g. watches, bracelets, glasses, clothes), smart appliances (e.g. refrigerators, robotic vacuum cleaners, TV sets or coffee filters), and not only in our homes and offices, but also in auto and pedestrian traffic - by smart cars, buses and even smart streets
- this perpetual collection of people's data enables one to track the actions and behavior of the users and derive sensitive information about individuals, which is not only utilized by the technology itself but also by third parties

Aim

 to increase readers' awareness by presenting an exhaustive inventory of data being collected, stored and processed in a smart environment

Methodology

- a set of ten privacy policies published by selected manufacturers of smart watches, health and fitness trackers, smart TVs and smart cars were overviewed
- the main data categories collected by the manufacturers were extracted and sorted, in order to get an image about the extent of our lives being recorded while using such devices

Results

Data collected by Smart TVs

| | Panasonic | Samsung | Sony | Philips |
|--|-----------|------------------|------|-----------------|
| Identification data | | | | |
| Name | * | * | * | |
| Username & password | | * | | * (consumer ID) |
| Email address | * | * | * | |
| Profile picture | * | | | |
| Phone number | * | * | | |
| Postal address | * | * | * | |
| Payment information (credit/debit card) | | * | * | |
| Age/date of birth | * | * | * | |
| Gender | * | * | | |
| Location | | | | |
| Postcode | | | | |
| Physical location of the device (CPS) | * | * (if consented) | * | |
| Nearby Wi-Fi access point | * | * | | |
| User generated data | | | | |
| Photos | | * | * | |
| Texts | | * | * | |
| Calendar | | * | | |
| Contacts | | * | | |
| Device data | | | | - 1 |
| Device model | * | * | | |
| Device serial number | * | * | * | |
| Date of purchase | * | | | |
| Operating system version | * | * | | |
| Configurations and settings | * | * | | * |
| MAC & IP address | * | * | | * |
| Channel zap behaviour | | | | * |
| Time and date of a "click" in the menu | | | | * |
| Automatically collected data (service use) | | 1 | | |
| Log files, search queries | * | * | | |
| Time and duration of use | * | * | | |
| Cookies | * | | | |
| Applications installed | | <u>'</u> | | • |
| Application click behaviour | | * | | * |
| Browsing data | * | * | | * |
| Used online applications | * | | | |
| Voice recordings (voice commands to a service) | * | * | | |
| Messages on discussion boards | * | | | |

Data collected by smart watches and trackers

| Identification data | Vector | Huawei | Apple | Samsung | Fitbit |
|---------------------------------------|--------|--------|----------|---------|--------|
| Name | | * | | * | * |
| Username & password | * | | | | * |
| Email address | * | * | | * | * |
| Profile picture | | * | | | * |
| Phone number | * | * | | * | * |
| Postal address | * | | | * | * |
| Payment information | * | | | * | |
| Age/date of birth | * | * | | | * |
| Gender, height, weight | * | | | | * |
| Biography | | | | | * |
| Location | | | | | |
| Country information | | | | | * |
| Real time location | * | * | | * | * |
| ID of area where the device is | | * | * | | |
| | | | | | |
| located/approximate location | | | | | |
| User generated data | * | | * | | |
| Photos | * | | * | | |
| Texts | 717 | | * * | | |
| Calendar | * | | ጥ | | |
| Feedback | * | ala. | | | |
| Data about purchased products | | * | 0 | | |
| E-mails | | | | | |
| Used apps | | | * | * | |
| Visited websites | | 1 | | * | |
| Number of steps, calories burned | | | | | * |
| distance travelled, sleep stages | | | | | |
| Contacts' data | | T | | | |
| Name, profile picture, phone | | * | * | | * |
| number and email address | | | | | |
| Email addresses, social | | | | | * |
| networking accounts, contact list | | | | | |
| on mobile device | | | | | |
| Automatically collected data (service | | | | | |
| Log files, buttons pressed | * | | | | |
| Support requests and results | * | | | | |
| Search queries | * | * | | * | |
| Streams and apps downloaded and | * | | * | | |
| stored | | | | | |
| Device data | | | | | |
| Model | * | | | * | |
| ID/ name | * | * | * | * | |
| Serial number | * | * | * | | |
| System and application versions | | * | * | * | |
| Regional and language settings | | * | | * | |
| Time/duration of use | | | * | * | |
| Additional data | | | | 1 | |
| Voice information recordings | | | | * | |
| (shared with 3 rd parties) | | | | | |
| Female health tracking | | | | | * |
| Messages to friends on discussion | | | | | * |
| boards | | | | | |
| Communication with coach | | | | | * |

Discussion and conclusions

- we do not express doubts about the declared purposes of data use in the policies, which refer mainly to service provision, product and services development, marketing, security assurance, fraud prevention and investigation
- we just intent to signal the fact that the extended use of IoT by citizens creates an extended attack surface for potential hackers, as big as our daily life
- besides the probability of attacks, other problems can be signaled: the process of collecting data is not transparent for the average user, the entities that use the data are often unknown and use inconsistent security measures, the privacy settings are buried deep in Settings menus, being difficult to be found and modified; when disabled, the "smart" functionalities of an object are reduced and valuable features are lost
- data flows function as serotonin intakes, offering us the illusion of happiness. But, on the other side of the story, same flows form quasi-permanent digital traces with unexpected uses – as mass aggregation in marketing databases, invasive target advertising, with effects like loss of autonomy and individual freedom

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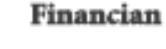




















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