Use of technology

I. Learning objectives

- To select a technological solution that has an optimal value trade-off between usefulness and privacy
- To distinguish technological solutions that do not discriminate
- To identify personal data (related also to the section “Privacy and confidentiality”)

II. Target group(s)

x Master’s students
x Doctoral students
□ Supervisors

III. Determining a story

As part of her thesis, Lea is doing research on food waste in households in her city. The idea is to engage people from all different types of households to make daily records of the food they bought and threw away. For each household, she needs to know basic demographic data such as the location, number of household members, and monthly income. Lea’s supervisor has suggested that Lea provide participants in the research with paper spreadsheets to fill in. But Lea really doesn’t like the idea of the paper records as they did not work well in the pilot among her friends, who often lost them. Lea is therefore seeking a technological solution for data collection appropriate for the 21st century. She is considering four technical solutions:

1) An app called MyFood, available for smartphones, that is free for Android users and costs a small fee for iPhone users. The app enables the convenient collection of data and has many additional functions – users can record their weight, exercise, calorie intake, health issues, etc. So, using this app might be beneficial for the people involved in the research as well: they would not only collect data for Lea’s research, but also do something for themselves. The app also has a “buddy” feature that enables users to share the data from the app with someone else. If Lea asks the participants to add her as a “buddy”, the data from their app would be synchronized every day with her phone and she could easily export the data she needs and ignore the rest.

2) A web application for data collection offered to all students and researchers from the university for their research. The app was developed a long time ago, has been used by many researchers, and has a maintenance team. If Lea makes an official request, which might take some time, then she will get administration access and can configure the application as needed. The configuration is complicated and not user friendly, but she could get help with it. The user interface for research participants is easy to manage and works well on a smartphone or computer, although it looks quite ugly. People don’t need to provide their email address to log in; rather, Lea will simply provide them with a unique login number. The data will be stored on the university server, which Lea can easily access from her administration interface.

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3) As Lea isn't sure whether she can manage the complicated administration interface of the university web application, she is considering converting the paper spreadsheet into a Google Sheets spreadsheet.

Each participant would have their own file in which to record the demographic data about the household and the everyday food data.

Answer options

1. The MyFood app for smartphones
2. The university web application
3. Google Sheets spreadsheet
4. MS Excel spreadsheet collected via email

IV. Game design elements

Instructions

Option A1 Topic-by-topic, individually	Option A2 Topic-by-topic with a facilitator (in-team)
For learners: • familiarise yourself with the topic in the *Guidelines* (10 min), then • read the corresponding vignette (10 min), • choose one answer option (4 min), and • access the score and the feedback (1 min). Total duration: 25 min	For a facilitator: • inform learners of the time allocated to read the topic in the *Guidelines* (10 min), then • introduce the corresponding vignette (e.g., by reading) and the answer options (10 min), • explain how the answer options should be understood and emphasize that only one answer option may be chosen (5 min), • once the chosen answer options are reported, summarise the results and announce the right answer (5 min), • present scores for all answer options and discuss the options using feedback (5 min), and • actively moderate the discussion. Total duration: 35 min

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Answer scores	
1. MyFood app	0
2. The university web application	10
3. Google Sheets spreadsheet	5
4. MS Excel spreadsheet collected via email	5

Feedback

Data about the food bought and thrown away are not personal, but together with the demographic data about the household and the email address of a given person, they become personal. Therefore, Lea needs to be careful.

The MyFood app collects and shares far too much data (breaking the principle of "data minimalisation"; please see the chapter "Privacy and confidentiality" in the *Guidelines*), some of which are sensitive. The data are shared not only with Lea, but also with whoever is the app provider. It discriminates against iPhone users by requiring a small fee, and discriminates against everyone who doesn't have a smartphone or doesn't want to install the app.

With the Google Sheets spreadsheet, Lea will collect only the data necessary for the research, but the data will be shared with Google and probably stored on servers outside of Europe, which is not compliant with the GDPR. People need to use their email to access the Google Sheets spreadsheet conveniently, so they would be sharing their personal information (i.e., email address) with Google. It might be a good solution if used only for the food records, with the household data being collected/stored separately.

Even though an MS Excel offline spreadsheet seems not to have any of the above data privacy and confidentiality risks, it is necessary to consider the stage of collecting the filled-in spreadsheets via email. We don't know which email provider Lea uses, or where and how it stores the emails. The same goes for the email providers of the people involved in the research. At the moment of attaching the spreadsheet, it, together with all the data it contains, will be associated with the person's email address, and some people might also add their full name in the signature. Therefore, the drawbacks are comparable to those of the Google Sheets spreadsheet solution. Furthermore, this solution lacks the positives of the others: most people won't be able to edit an MS Excel spreadsheet on their smartphone, and some people might not have MS Excel (which is a paid application) or even its free open-source variation (e.g., OpenOffice or LibreOffice). Also, collecting many files via email is clumsy from Lea's perspective (e.g., she might "lose" some emails or emails might be diverted to spam).

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The university-provided web application sounds ideal, as we can assume that an official faculty application that has been kept updated and is used by many researchers is safe and protects the user data well. In any case, no email addresses or other personal identifiers are associated with the data when stored. The data are stored on institutional servers (which is a solution recommended in the chapter “Privacy and confidentiality” in the *Guidelines*). The web app can be used on all smartphones and on computers. We recommend that Lea not be put off by the complicated setup at the beginning, as she could get help with that.

Still, all these technological solutions exclude people who are unfamiliar with or unwilling to use smartphones and computers. Lea might consider offering people the paper spreadsheet as well, in order to reach the widest range of the population. Another inclusive solution might be to use audio recordings, but their collection and processing would need to be considered carefully.

In fact, one might find a wide variety of possible solutions and it is impossible to cover all of them in this simple exercise. This story and the possible options instead illustrate what issues might emerge and how a researcher should think about them.

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