

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application

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Abstract

The walkthrough method originated from the field of software development but may be employed in several social research designs. However, its applications in the social sciences still need to be developed and consolidated.

This article presents an application of the walkthrough method, called the Sociodigital walkthrough (SDW), to the study of human-machine interaction (HMI) within the Campania in Salute smartphone application, which provides all public healthcare services in the Campania region of Italy.

We argue that this method allows the researcher to engage with the materiality of technology. Furthermore, it is relevant for analysing the interaction between the individual and the digital environment.

The Sociodigital walkthrough could be employed for other exploratory studies on digital platforms and prove interesting if used in digital research designs.

Keywords: walkthrough, digital methods, Sociodigital walkthrough.

1. Introduction

The proliferation of digital technologies and their pervasiveness in the most heterogeneous social contexts make the digital increasingly relevant for the methodological discourse (Amaturo & Aragona, 2019; Lupton, 2014; Salganik, 2019). The growing literature on digital methods (Marres, 2012, 2017; Rogers, 2009; Veltri, 2021) has led to the formalisation of different approaches

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to digital social research (Aragona, 2021). Current advancements emphasise the need for techniques that meld various approaches, spanning from computational social science to the digital humanities (Amaturo & Aragona, 2021). This development reflects the growing importance of embracing interdisciplinarity and innovation in meeting the challenges of digital methods in contemporary social research.

The walkthrough method has mainly been employed for the study of usability issues in human-computer interaction (HCI) according to different design settings. In this article, we use the Sociodigital walkthrough (SDW), an enhancement of the renowned walkthrough method, to address sociological questions about access to health services mediated by digital applications.

The walkthrough and the cognitive walkthrough have been used in various fields, for example: the design of information systems (Bennett & Stephens, 2009; Blomkvist & Bode, 2012; Mahatody et al., 2010), the evaluation of the environment (Caglayan & Afacan, 2021), the education (Apps et al., 2022), the observation of the “user interface” (Karat et al., 1992) to identify bugs and improve features (Light et al., 2018). It helps in getting an overview of the process or system examined (Rieman et al., 1995).

The Sociodigital Walkthrough is an interdisciplinary method that crosses sociology, human-computer interaction, science and technology studies.

SDW is a sociotechnical method that considers the materiality of the technological systems (Haider & Sundin, 2023), which are considered actants (Callon, 1986; Latour, 1987, 2005).

In the social sciences, the walkthrough method is employed not only to identify the design aspects of digital platforms, but also to address digital inequalities (Herrmann et al., 2007; Kammerbauer & Wamsler, 2017; Troeger & Bock, 2022). It can shed light on issues related to the digital divide (van Dijk, 2013) and digital literacy (Belshaw, 2012; Gilster, 1997; Martin, 2008; Reddy et al., 2020) and on the analysis of the nexuses between social disadvantages and digital technologies namely Sociodigital inequalities (Halford & Savage, 2010).

The digital platform employed as a case study for our research is the “Campania in Salute” app. It is an application developed for citizens who reside in the Campania region (Italy) to book specialist medical appointments, manage appointments, and view payment history. Through the app, the users can also access and manage their health documents and personal data through the “Electronic Health Record System” and choose or change their general practitioner or paediatrician.

Through the SDW we observed that access and use of digital platforms are not equally easy for all subjects. We attribute these difficulties to several factors, such as, for example, the absence of suitable and compatible equipment for the system, the different uses of digital technology, linked to socio-economic gaps

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application
Francesco Amato, Biagio Aragona, Mattia De Angels

(Hargittai, 2003; Perrin, 2020), the inability to access due to technical issues, such as maintenance, malfunctions and bugs in the system, but also, the level of digital skills that influence the subject's experience on the platform (van Deursen & van Dijk, 2011, 2014). Furthermore, we are interested in how, mixed multiple factors, such as the technological infrastructure, the design, as well the distribution of resources, and the socio-economic conditions among the individuals, may influence the possibility of getting through the application and accessing health services.

2. The SDW method

In SDW the platform is an actant (Callon, 1986; Latour & Woolgar, 1979; Latour, 1987, 2005) considered in its socio-materiality (Haider & Sundin, 2023). Through the SDW we get both a description of the platform and an observation of individuals' interaction within the platform.

The method consists of three phases. The researchers carry out the first phase (SDW P1), which involves conducting a general observation of the platform. General aspects are observed and identified. After that, the researchers perform a walkthrough of the platform, editing a diary and the field notes. The second phase (SDW P2) consists of the analysis of the SDW P1 for drawing the data collection form and the tasks.

In the third phase, a second walkthrough is carried out by a sample of individuals, who, while navigating the platform, complete the data collection form (SDW P3).

In the first phase (SDW P1), the digital platform is the unit of analysis. During the platform observation, the researchers interact with the digital system and note down the actions they perform and what they observe. Then they edit field notes and diaries (Pink et al., 2015; Ritter, 2022).

The observation is focused on the design, the affordances — which are the kind of actions that can be performed on the application — and the possible tasks to run. The combination of design affordances and tasks may have consequences on access to health services.

In the second phase (SDW P2), the researchers build the questionnaire containing the demographics and the tasks, structuring the diary and the field notes. The result is a questionnaire with a mix of closed and open-ended questions. Once completed, the questionnaire is administered in person or online to the individuals in SDW P3.

In SDW P3, the researchers ask the individuals to fill in the questionnaire while the researchers observe them directly or through a video conferencing platform; furthermore, they are informed that the walkthrough will be recorded.

What emerges from the results of SDW P3 is thus included within the interpretative schemes that the research group has elaborated in SDW P1.

The integration between the phases also allows the researchers to check how the impressions and interpretations of the digital platform developed during the SDW P1 are appropriate.

In the first phase, the platform, identified as a cultural product, is designated as the primary unit of analysis. During this phase, the characteristics that define the non-human actor are collected to reassemble the network that composes it.

The results of the first phase allow, in the second phase, the construction of the data collection form and the tasks that will be used for the third phase. In the third phase, the units of analysis are the individual, the platform and their interrelation.

3. SDW of Campania in Salute App

3.1. Research design

The research was carried out between March and April 2023. The focus is on the interactions that take place on the platform and the social and material intervening variables that influence its use. In the SDW P1, the digital platform "Campania in salute" is the unit of analysis. Researchers observed its design components, affordances, and possible criticalities and derived insights to be used in the following stages. Subsequently, the individual is assumed as the unit of analysis. We selected a convenience sampling of 10 students of the master's degree course in "Digital Sociology and Web Analysis" of the University of Naples Federico II, who held high levels of digital skills and digital literacy, as well as a similar awareness of digital technologies. The sample filled in the questionnaire with socio-individual variables, variables on the actions performed on the platform, and some comments about the ease of interaction with it. In this article, we focus more attention on the aspects inherent to the application of the method and we are not going in-depth into the literature about the inequalities that can emerge when access to health services is mediated by digital technologies (DiMaggio et al., 2004; Zhang et al., 2020).

3.2. SDW P1

In this phase, we collected a set of information on the platform, and the list of tasks that could be achieved (see table n.1). More specifically, we had:

“Platform information”. Platform information was drawn from:

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application
Francesco Amato, Biagio Aragona, Mattia De Angels

the Citizen Health Portal website (Visited on 03/16/2023) (link 1) and the page on Google play store, where the Campania in Salute application is downloadable (Visited on 03/16/2023) (link 2).

The following information was collected from the Citizen's Health Portal:

- The Campania in Salute App is available on the App Store and Google Play.
- Access to the APP is through SPID credentials (Public Digital Identity System) or the Electronic Identity Card (CIE).

To facilitate access, it is possible to set a personal PIN code or enable biometric recognition which allows access for 30 days from the last authentication via SPID or CIE.

- Key Actions: 1) Book; 2) Pay; 3) Consult health documents; 4) Choosing/revoking the family doctor; 5) Consulting the active ticket exemptions; 6) Income self-certification for ticket exemption.

The researchers observed that:

The page is structured in such a way that the functions are listed first, followed by access and the link to download the application. The page is quick to consult and provides general information about the application. All the links on the page work and correctly point to the application file in the device's memory. Further details are given on how to access the application, regarding two options, quick access via PIN or biometric recognition. A possible compromise between the security offered by the SPID/CIE system and the speed/ease of access has been identified.

From the page on the Google play store, where it is possible to download Campania in Salute, further information was found:

- Application provider: SO.RE.SA. SPA
- Required OS: Android 5.1 and higher, IOS 10.1 and higher, device from iPhone 5S and higher.
- Release date on the store: August 25, 2021
- Permissions requested by the application: calendar, camera, location, storage space, and other (activation of hardware and software features of the device).
- Privacy policy.

The researchers then observed that:

- The structuring of information was complex. App's information could only be obtained through the display of internal sub-files and external links. This mainly focused on booking services, rather than other affordances and issues relating to security in terms of privacy.

We proceeded with the observation of the platform in order to unfold the affordances and the front-end design components.

During the observation, the researchers edited diaries and field notes:

The application presents essential functionalities and graphical solutions. The application recalls the graphical vesture and, perhaps, also the IT structure (this is the result of speculation on the part of the two researchers) of the Sinfonia application for Covid-19. This suggests that some of the design work of the 'Campania in Salute' application may have been taken from previous projects. In general, the application is functional, as even considering the limited interactivity of the software, it is still "well done". Its compactness is effective in highlighting the available functions in a static, but concise menu, from which the user can access sections of the application. The researchers' walkthrough revealed functional issues in specific parts of the app, such as logging in, switching between pages of the app, and subsequent use of the app. Warnings and error messages were detected numerous times, some of which were generated by the application during basic usages such as simple navigation between menus and sections. From this, it appears that the app's back-end system acts beyond the previous warning, never quite clarifying the problem that has occurred and providing no explanation of the subsequent correct operation. These problems also seem to be in line with those encountered during log-in and concerning the SPID system, which is also complicit in presenting errors during authentication, but then authenticates the applicant anyway. In addition, it was possible to detect a login practice, which allows, after SPID access, to set a pin with which to later access the app or the biometric settings already used to unlock the smartphone, without having to resort to SPID at every login.

The considerations regarding the functioning of the application appear to be the same as those concerning the other tools in use in the Italian public administration, presenting features of:

- Minimalistic visuals.
- Information redundancy.
- Slowness of the system.
- Presence of unclear warnings and errors.
- Impossibility to proceed further in some cases.

Given the problems encountered, the phenomenal characteristics of the application, the warning messages, and the process of authentication by PIN, it is believed that the application casts doubt on the security guaranteed by the SPID authentication process. Similarly, the continuation of the session in the background and its non-interruption after 5 minutes of inactivity also highlights some concerns about the possibility of accessing the application and sensitive data once the application has been opened and left in the background on the device. There are, from the researcher's point of view, two issues that arise in the interaction process between the individual and the application. The first can be traced back to the frame of privacy in digital and the perception of privacy protection in the digital environment. While the second can be traced to the frame of digital literacy, the digital divide, and the relationship with the social divide.

The Sociodigital Walkthrough: Studying the Nexus Between Social
 Characteristics and Material Technicalities on a Healthcare Application
 Francesco Amato, Biagio Aragona, Mattia De Angels

The information gathered has been structured in a table (1) with four dimensions: people, design, affordances, and tasks. The table is derived from the adaptation to the social sciences of the factors table used in the 'PETT Scan' method (people, environments, tools, and technologies) presented by Holden and Carayon (2021). For each dimension, the type of data, and the data collection instrument is specified.

Table 1. Data instrument and type of data by dimension.

	What data are collected	Data collection instrument
People	Demographics Digital skills Others	Questionnaire
Design	Systems main features and characteristics front-end	Data collection form
Affordances	Options and possibilities of action within the system. Essential for the definitions of the tasks to be performed by the sample.	WT of the researcher. Diaries and field notes
Tasks	Specific activities that can be assigned to individuals according to the platform/app flow and to the ease of the task.	Data collection form on the different tasks characteristics

3.3. SDW P2

In SDW P2, we proceed with the design of the questionnaire and the definition of the tasks. The tasks are as follows:

- Connect on the Campania in Salute application.
- View the oldest recipe in the Electronic Health Record.
- Search for a private health facility in your province of residence.
- Close and reopen the application, log in and view the home screen.

In this part, the instructions for the administration and execution phase of the walkthrough (SDW P3) are formulated.

The first part provides information on how to perform the tasks and how to fill in the form. The second part (questionnaire) collects the socio-demographic variables: age, gender, education, occupation, the possession of digital identity, the device in use, and everyday usage of the internet. The third (data collection form) represents a structured version of a diary and field notes to register the actions, observations, and perceptions of individuals interacting with the platform.

3.4. SDW P3

The third phase of research consists of the walkthrough of individuals. The research group provided general and standardised instructions for the execution of the walkthrough. During the user's activity, the researchers kept the video camera off and the microphone deactivated, this serves to reduce obtrusiveness. Furthermore, this allowed the subjects to view their data privately.

During the walkthrough, the user filled in the questionnaire while explaining what was doing and its reasoning. In such a way the individual opened to dialogue and expressed sensations and perceptions.

In the meantime, the researchers took note of all the relevant aspects they observed in the individual's interaction with the platform.

The following is what emerged from this phase of data collection.

The problems encountered in accessing the application, although not specific to the Campania in Salute application, can be traced back to SPID and the operators providing the service.

These problems may generate disadvantages and inequalities in accessing the service. If access to the application is repeatedly blocked by the system - this actually happened during the walkthrough - we notice the emergence of feelings of surrender from the subjects, who then decide to stop browsing and give up using the application. Subject α . in the detailed account of his experience with the application describes how his interaction with the authentication system led to the blocking of his credentials, despite he believed he had entered them correctly.

I can't access the app because my SPID credentials are temporarily blocked. After downloading the app, I press the login button via SPID, selecting "PosteID" as the digital identity provider. Although the SPID access credentials are automatically saved on my mobile phone, once entered, I get the message of an error loading the credentials.

For this reason, I proceeded to insert them manually, but the loading error message continues to appear.

My last attempt is to authenticate via the PosteID app, but once this procedure is complete, the following message appears: "Warning. Credentials are temporarily locked. Your credentials have been temporarily blocked due to too many failed authentications for incorrect credentials. They will be active again in 30 minutes. If you don't remember your password, please use the link in the email we just sent you. The link will allow you to set a new password."

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application
Francesco Amato, Biagio Aragona, Mattia De Angels

So due to the number of failed logins (4) despite the correct credentials being entered both automatically (because saved on Google) and manually, I was unable to access the app.

α .

During the walkthrough, it became evident that the this first task, which involved gaining access to the platform, was the most time-consuming task.

I was unable to proceed as the application blocked inserting the SPID and would not let me insert anything.

β .

According to this perspective, the technical limitations given by the excessive complexity of the multi-stage authentication system as highlighted in the detailed walkthrough of γ . may lead towards a rejection of the system.

I enter with SPID to access the application. I am then asked to select the provider of the digital identity. It should be noted that a notification relating the cookies (in blue) appears on the screen of my mobile device.

I select the digital identity provided by Poste ID. A SPID two access request opens. I am asked for the credentials of the SPID identity associated with the Post Office. I enter the username, or in my case the email. The password is automatically generated, but I re-enter it to be safe. Enter your credentials and click on the box to log in. A further screen comes out in which I am asked to carry out a further check (level two of SPID security). The possible options for this step are to receive a notification on the PosteID App or generate a PIN. I chose the first option. I give the authorization via fingerprint on the Poste ID app, then I return to the browser where the system finally asks to consent to sending data to the service provider. I Click on "I agree" and I get an error screen with the message "login failed". I return to the initial screen and carry out the operations again. This time the Poste ID app redirects me to the app that is the subject of this study. A menu opens in which my personal information is already entered. I click on "next". A data collection form opens in which further contact information is requested, many of which, including for example email, citizenship, residence address and mobile phone number are already entered. I click on a button to accept the terms of service and I click on a box that says "REGISTER". A screen opens asking me to enter an unlock code. In particular, I have to enter a 5-digit code. Reading below, I discover that the code will be requested every time I open the app. I enter a code. I re-enter the code to confirm it and move on.

Then what I see I assume is the application's main menu.

γ .

In at least two cases the communication mismatch between the application and SPID blocked the credentials of the subjects.

The two individuals who received the blocking notice reacted differently. One insisted on the authentication process and managed to enter the application, whereas the other, upon receiving the message, decided to stop the walkthrough. This highlights that if the credentials were blocked, there might be users who were still interested in using the application who could devote other energies and make a cognitive effort to solve a problem caused by the system, while others, on the other hand, might give up using the tool altogether. This relates to the digital divide and the lack of specific digital literacy skills that, to an unskilled person, might already in the first instance prevent access to the application.

For a group of individuals of a higher age group (50-99) this method of access could be complicated, if not impossible, in Campania, I do not think that the levels of digital literacy are inclusive for every age group, even the highest, to implement this only way to health services would jeopardise the autonomy of these people, for other reasons they will need family or administrative support to access the services. Despite the fact that the elderly and adults appear to be the segment of the population that makes the most use of healthcare services. This certainly turns out to be a critical point, for each task, but above all for the first one.

δ.

[...] regarding the use of this application, probably the ease encountered by the undersigned could turn into difficulty for those who do not exercise the technological tool with a certain amount of practice (e.g. the elderly).

ε.

ε. expresses its considerations regarding the application and process of actions necessary to achieve the tasks.

I think that the operations that should be immediate shouldn't take more than 3 minutes, furthermore I believe that those who are not used to using the applications periodically may find it more difficult than those who, like me, consider these procedures trivial; as in the particular case of the repetition that I have carried out of the various procedures that have suffered an interruption due to the system, this may not be a simple solution to replicate for everyone.

ε.

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application
Francesco Amato, Biagio Aragona, Mattia De Angels

He continues his reasoning by proposing a solution to be integrated within the application.

So, I believe that, in these cases, the application can provide suggestions.
e.

3.5 Analysis of the nexuses between social characteristics and material technicalities

The lack of access to Campania in Salute app may occur for several reasons, not only related to the digital literacy or the cultural background of the individuals, but also to system malfunctions, technical problems, or service failures. Regarding access, it has emerged that many factors come into play. The exploratory nature of the research does not allow us to produce exhaustive considerations concerning the causes that could prevent access. However, we observed that the user who is unable to access the app may react negatively towards it. Due to the frustration perceived during the HMI, the user identifies the platform as problematic, and the lack of access may entail a significant social disadvantage. The issue of access and the resulting inequalities also concern the compatibility of the platform with the digital devices owned by the users, which are related to socio-economic conditions. These aspects although they may seem merely technical, actually arise from the intertwining of individuals, technology, and associated factors.

When defining the access standards and the compatibility of the devices that will be able to use this system during the implementation of the platform, the coding team attempts to achieve a balance between, on the one hand, the technical and smooth functioning of the platform and, on the other hand, guaranteeing access to as many users as possible.

This is directly linked to the issue of digital literacy since recognising that one's equipment is obsolete and incompatible with a platform is an action that requires the user to be able to recognise the technological level of one's equipment. It is important to note that digital literacy is not just something that citizens learn through their schooling and professional experience, but a type of competence that is acquired and developed during interaction with technology throughout an individual's life (Martin, 2006). Ultimately, these skills are not something that can be attributed to the entire population, but rather something that they can be expected to have acquired during their years of interaction with digital technologies.

The device incompatibility with the app may exclude some users. The SDW method points to these circumstances. It may reveal technical problems

that can be attributed to simple system malfunctions, problems of a sociotechnical nature, such as the exclusion of a device and an operating system from those supported, or problems that can be attributed to the skills required to use a system. These are all issues that may appear to be purely technical, but they intertwine social disadvantages.

4. Conclusions

Our research highlights how the Sociodigital walkthrough can be employed in the social sciences. The SDW aims to understand the sociotechnical affordances of the platform through observation and interaction.

This method allows the researchers to understand some possible criticalities, to discuss within the research group and to submit the relevant aspects to third parties. Within this multi-stage process, a recursive system is also formed that relates what is detected by individuals with what is detected by the researchers.

Through the walkthrough, the researchers contextualise the interaction, noting the factors involved in the act of experiencing the digital platform. The walkthrough of Campania in Salute highlighted problems such as the system used for authentication excluding some users from the possibility of accessing the application. Although our sample does not allow the generalization of any result, the walkthrough also reveals the effects of digital literacy, which may intervene not only when it is low or absent, but also in the presence of high levels of digital literacy. Our sample had high digital skills, and some did not read the app's manual and the instructions presented on the platform. These users may have used the application carrying all their experiential background and this led them to perform the walkthrough without being able to complete all the tasks assigned to them.

Our sample of under 30 is characterized by advanced proficiency not only in specific digital technologies, but also in widely used applications. Despite the link commonly established in the literature between young people and digital skills (Heponiemi et al., 2022), what emerged during the interaction described by the subjects were not only the skills and previous knowledge due to their high digital literacy that led them to think about what they were conducting, but rather the use of interaction strategies and previous patterns already developed as a result of continuous interactive processes with technologies and platforms previously encountered in daily life practices of use (Airoldi, 2021).

The reiteration of these pattern of use, whether successful or not, can lead to conflicts with the unique affordances of the system. Such interactions may

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application
Francesco Amato, Biagio Aragona, Mattia De Angels

give rise to discrepancies between acquired skills and interaction patterns aligned with the technology's affordances.

This mechanic interaction with the application indicates how the topic of digital literacy and digital competencies is relevant not only for individuals with low levels of competence, but also for individuals with high levels of competence, who may not correctly and safely handle digital technologies. Even high levels of competence may correspond to interpretative patterns that prevent the subject from handling correctly and safely digital technologies. This could be attributed to a form of “expertise inversion effect” whereby experienced individuals, subjected to learning techniques, utilise prior patterns that may lead to underperformance of their potential (Sweller et al., 2011).

Results revealed that the subjects did not detect any of these critical issues merely focusing on technical questions related to the functioning of the app within a dichotomous dimension of “it works then it is easy” and “it does not work then it is difficult”.

We are conscious that this research method requires further applications on a larger sample of individuals, and this is one of the future objectives of our research. Moreover, we need to extend the walkthrough to other applications to better understand if and how it could be effective for studying the interaction between individuals and digital systems.

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References

- Airoldi, M. (2021). *Machine habitus: Toward a sociology of algorithms*. Polity Press.
- Amaturo, E., & Aragona, B. (2019). Per un'epistemologia del digitale: note sull'uso di big data e computazione nella ricerca sociale, *Quaderni di sociologia*, 81(81-LXIII), 71-90.

- Amaturo, E., & Aragona, B. (2021). Critical Optimism: A Methodological Posture to Shape the Future of Digital Social Research, *Italian Sociological Review*, 11 (4S), 167-182. <http://dx.doi.org/10.13136/isr.v11i4S.429>]
- Apps, T., Beckman, K., & Howard, S. K. (2022). Valuable data? Using walkthrough methods to understand the impact of digital reading platforms in Australian primary schools, *Learning, Media and Technology*, 1-16.
- Aragona, B. (2021). *Algorithm Audit: Why, What, and How?*. Routledge. <https://doi.org/10.4324/9781003080381>
- Belshaw, D. (2012). *What is 'digital literacy'? A Pragmatic investigation*, Doctoral dissertation, Durham University.
- Bennett, D. J., & Stephens, P. (2009). A cognitive walkthrough of autopsy forensic browser, *Information Management & Computer Security*, 17(1), 20-29.
- Blomkvist, J., & Bode, A. (2012). Using service walkthroughs to co-create whole service experiences, In *International Service Innovation Design Conference* (Vol. 3).
- Caglayan, I., & Afacan, Y. (2021). Simulation-based service walkthrough (SBSW) to assess airport environment performance, *Archnet-IJAR: International Journal of Architectural Research*, 15(3), 905-924.
- Callon, M. (1986). 'The Sociology of an Actor-Network', in Callon M., Law J., Rip A., *Mapping the Dynamics of Science and Technology*, London: Macmillan.
- DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). From unequal access to differentiated use: A literature review and agenda for research on digital inequality. *Social inequality*, 1, 355-400.
- Gilster, P. (1997). *Digital literacy* (p. 1). New York: Wiley Computer Pub..
- Haider, J., & Sundin, O. (2023). Sociomateriality. In: Hicks, A., Lloyd, A., & Pilerot, O. (eds), *Information Literacy through Theory*, 2023, Facet Publishing.
- Halford, S., & Savage, M. (2010). Reconceptualizing digital social inequality. *Information, Communication & Society*, 13(7), 937-955. DOI: 10.1080/1369118X.2010.499956
- Hargittai, E. (2003). *The digital divide and what to do about it*. New economy handbook, 2003, 821-839.
- Heponiemi, T., Kaihlanen, A. M., Kouvonon, A., Leemann, L., Taipale, S., & Gluschkoff, K. (2022). The role of age and digital competence on the use of online health and social care services: a cross-sectional population-based survey. *Digital health*, 8, 20552076221074485.
- Herrmann, T., Loser, K. U., & Jahnke, I. (2007). Sociotechnical walkthrough: a means for knowledge integration, *The Learning Organization*, 14(5), 450-464.
- Holden, R. J., & Carayon, P. (2021). SEIPS 101 and seven simple SEIPS tools, *BMJ quality & safety*, 30(11), 901-910. <https://doi.org/10.1136/bmjqs-2020-012538>

The Sociodigital Walkthrough: Studying the Nexus Between Social Characteristics and Material Technicalities on a Healthcare Application
Francesco Amato, Biagio Aragona, Mattia De Angels

- Kammerbauer, M., & Wamsler, C. (2017). Social inequality and marginalization in post-disaster recovery: Challenging the consensus?, *International Journal of Disaster Risk Reduction*, 24, 411-418.
- Karat, C. M., Campbell, R., & Fiegel, T. (1992). Comparison of empirical testing and walkthrough methods in user interface evaluation. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 397-404).
- Latour, B., & Woolgar, S. (1979). *Laboratory life: The construction of scientific facts*. Princeton, NJ: Princeton University Press
- Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Harvard university press.
- Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-network-theory*. Oxford: Oxford University Press.
- Light, B., Burgess, J., & Duguay, S. (2018). The walkthrough method: An approach to the study of apps, *New media & society*, 20(3), 881-900.
- Lupton, D. (2014). *Digital sociology*. Routledge.
- Mahatody, T., Sagar, M., & Kolski, C. (2010). State of the art on the cognitive walkthrough method, its variants and evolutions, *Intl. Journal of Human-Computer Interaction*, 26(8), 741-785.
- Marres, N. (2012). The redistribution of methods: on intervention in digital social research, broadly conceived. *The sociological review*, 60(1_suppl), 139-165.
- Marres, N. (2017). *Digital sociology: The reinvention of social research*. John Wiley & Sons.
- Martin, A. (2006). A European framework for digital literacy, *Nordic Journal of Digital Literacy*, 1(2), 151-161.
- Martin, A. (2008). Digital Literacy and the “Digital Society”. In C. Lankshear, & M. Knobel (Eds.), *Digital Literacies: Concepts, Policies, and Practices* (151-176). New York: Peter Lang.
- Perrin, A. (2020). Half of Americans have decided not to use a product or service because of privacy concerns. Pew Research Center. [Online] 14 april 2020. <https://www.pewresearch.org/fact-tank/2020/04/14/half-of-americans-have-decided-notto-use-a-product-or-service-because-of-privacy-concerns/>.
- Pink, S., Horst, H., Lewis, T., Hjorth, L., & Postill, J. (2015). *Digital ethnography: Principles and practice*. SAGE Publications Ltd.
- Reddy, P., Sharma, B., & Chaudhary, K. (2020). Digital literacy: A review of literature, *International Journal of Technoethics (IJT)*, 11(2), 65-94.
- Rieman, J., Franzke, M., & Redmiles, D. (1995). Usability evaluation with the cognitive walkthrough. In Conference companion on Human factors in computing systems, 387-388.

- Ritter, C. S. (2022). Rethinking digital ethnography: A qualitative approach to understanding interfaces, *Qualitative Research*, 22(6), 916-932.
- Rogers, R. (2009). *The End of the Virtual: Digital Methods*. Amsterdam: Amsterdam University Press.
- Salganik, M. J. (2019). *Bit by bit: Social research in the digital age*. Princeton University Press.
- Sweller, J., Ayres, P., Kalyuga, S., Sweller, J., Ayres, P., & Kalyuga, S. (2011). The expertise reversal effect. In *Cognitive load theory*, 155-170. DOI:10.1007/978-1-4419-8126-4_12 .
- Troeger, J., & Bock, A. (2022). The sociotechnical walkthrough—a methodological approach for platform studies, *Studies in Communication Sciences*, 22(1), 43-52.
- van Deursen, A., & van Dijk, J. (2011). Internet skills and the digital divide, *New Media & Society*, 13(6), 893-911. <https://doi.org/10.1177/1461444810386774>
- van Deursen, A., & van Dijk, J. (2014). The digital divide shifts to differences in usage, *New Media & Society*, 16(3), 507-526. <https://doi.org/10.1177/1461444813487959>.
- van Dijk, J. (2013). A theory of the digital divide. In M. Ragnedda, & G. W. Muschert (Eds.), *The digital divide: the internet and social inequality in international perspective* (pp. 29-51). (Routledge advances in sociology; Vol. 73, No. 73). Routledge.
- Veltri, G. A. (2021). *La ricerca sociale digitale*. Mondadori.
- Zhang, M., Zhao, P., & Qiao, S. (2020). Smartness-induced transport inequality: Privacy concern, lacking knowledge of smartphone use and unequal access to transport information. *Transport Policy*, 99, 175-185.