

Designing visual diagrams to explain how to access public online services to vulnerable audiences: insights from a field experience in Italy

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Abstract

Accessing online services provided by the public administration is now essential to fully participate in the life of modern societies. For some categories of users, however, this can be a complex task especially if they face language, cultural or digital barriers. These users can be supported by informational materials that explain in a simple way how to use these online services. This article describes a field experience in which visual diagrams were created as an information support for accessing public digital services for employment, training, health and public transportation. The activity was conducted according to a user-centered design approach that involved domain stakeholders and the target users – migrants who recently immigrated to Italy (considered “extreme users” in this scenario) – through user testing that gained insights that might also prove to be beneficial for other vulnerable users.

Keywords

Visual diagrams, digital public services, e-government, vulnerable audiences, User-centered design

1. Introduction

The most recent data on digitalization in Italy (DESI Index report, 2022²) showed numerous developments in digitalizing public administrations and public services. In the last five years Italy has increased the number of digital public services significantly, closing in on the EU average of supplying digital services. However, the same report revealed that more than half of the Italian population still do not have at least basic digital skills, a percentage that is below the EU rate. Digital public services seem to be especially difficult for citizens to access, given that, according to the DESI index, only 40% of Italian internet users use digital public services (against an EU average of 65%).

The problem is complex and wide-ranging and will not be addressed in this contribution. Instead, the focus is on one specific aspect in this area, namely the supportive communication tools that can be provided to facilitate initial access to public digital services.

In administrative communication, instructive text should be used to explain norms and procedures (including procedures for accessing online services) to lay users who could face difficulties in understanding the technical language of the public administration [1] or even comprehensibility-enhanced texts if they are more vulnerable in accessing public information like low literacy people or people with low second language proficiency [2]. These tools can reduce the communication barriers and thus facilitate the accessibility of information. In fact, as well indicated by the Hildesheim Model

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² Digital Economy and Society Index (DESI) 2022 Italy. See <https://ec.europa.eu/newsroom/dae/redirection/document/88708>

[3], accessibility is a multi-layered concept. According to this model, in order to be accessible, information must not only be retrievable (users must be able to access it) but also comprehensible (users must be able to understand it)³. Only in this way can information also be action-oriented, meaning it can enable users to act upon it, such as accessing an online public service. Supportive communication tools can help to make the public service “people-centric”, meaning they are accessible to all segments of the population [4]. Not being able to access a public service due to a lack of adequate instructions, in fact, violates a citizen's important right, and moreover those who need the service most are often those who face the greatest difficulty accessing it [5].

2. Context and aims

Italian public Web sites do not always offer instructions on how to access online services, and when there are, they are usually text-only. The comprehensibility of these texts is often an initial barrier for most of the population, as they tend to conform stylistically to traditional administrative communication which is often too complex for many lay people [6]. The comprehensibility of this written information is even more arduous for those who also encounter other communication obstacles, such linguistic or cultural barriers [7] like migrants with low second language skills.

Studies show that a very efficient way to enhance comprehension of complex language to non-experts is through the use of visual aids. Visual organizers, for example diagrams, might allow users to gain a clearer comprehension of a text, surpassing what words alone can effectively communicate [8].

This contribution describes a field experience that experimented with designing and implementing visual diagrams as instructional tools for facilitating access to digital procedures. The term 'visual diagrams' refers here to process diagrams usually used to help reveal the steps, actions and time frames involved in an activity and which often include pictograms or ideograms to illustrate each step [9].

Visual diagrams are recommended as a support for understanding legal and administrative information [10] especially because, in addition to using visual elements, are able to provide information where textual medium is limited, namely the logical connection of administrative concepts [11].

The use of visual aids to make the content of the institutional texts more comprehensible and the administrative procedures more accessible is also recommended in institutional guidelines on administrative document drafting [12].

The visual diagrams, subject of this contribution, were devised in the framework of the TEAMS⁴ project, an Italian project funded by the Asylum, Migration and Integration European Fund (AMIF) from October 2018 to March 2023, aimed at fostering integration of migrants living in the Tuscan region of Italy. As part of the specific project action dedicated to public communication, visual diagrams were created to explain how to access the most common online services provided by the Tuscan Region Administrative body in the areas of employment, training, health and public transportation. The activity was carried out in collaboration with the public relations office of the same administration.

The intended audience of the visual diagrams were recent migrants who have basic knowledge of Italian (especially administrative language) and of how Italian public administration functions. The diagrams were created to be available to users and civil servants on the PAeSI Web Portal⁵ (an Italian institutional website on immigration procedures and norms) and in immigration and public relations offices, where they can be used as informative support tools.

³ According to this model, accessible information must also be perceptible (users must be able to perceive it through their sensory channels), linkable to previous knowledge, and acceptable.

⁴ TEAMS stands for “Tuscany Empowerment Actions for Migrant System”. More information on the project at www.immigrazione.regione.toscana.it/?q=progetto-teams

⁵ www.immigrazione.regione.toscana.it

3. Method

In the framework of a User-centered approach [13, 14, 15], the design of the diagrams was carried out using a collaborative method which, through different design phases (from scenario analysis to prototype evaluation and redesign) involved stakeholders like civil servants, and linguistic-cultural mediators, as well as representative groups of target users. The User-centered design approach focuses on the users and their needs through an iterative process of prototype testing and redesign, in order to obtain usable products.

3.1. Activity phases

The activity was carried out according to the following stages:

1. Identifying the online services that are most difficult to access by the target users;
2. Retrieving instructive texts explaining the chosen digital services (source texts);
3. Linguistically simplifying the source texts;
4. Creating the first low-fidelity prototypes of the diagrams (structural and textual only);
5. Implementing the high-fidelity prototypes of visual diagrams;
6. Evaluating the prototypes with linguistic-cultural mediators (expert-judgment-focused evaluation) [16] and making modifications based on the feedback obtained;
7. Comprehensibility testing of the modified visual diagrams with the target users.

The first and second phases (identification of the online services and their explanations) were carried out with the support of the civil officers involved in the project. The identification was made based on their experience at the public relations front-office, which counts a high user base of migrants who need access to digital public services. Seventeen online services were selected that belong to the areas of health (e.g., how to book a medical visit), education (e.g., how to find and attend an online training course), work (e.g., how to find and apply for a job) and transport (e.g., how to buy a bus pass).

The texts explaining access to those services were then simplified linguistically so that they were as simple as possible and adapted to the project's target audience. To this end, the texts have been simplified in accordance with the Easy Language rules. Easy language is a form of accessible written communication with maximally enhanced comprehensibility initially developed for individuals with cognitive impairments but considered useful for other user targets as well, like migrants who have limited proficiency in their second language [3]. The discussion with civil servants was also very important at this stage because they provided useful suggestions. For example, they cautioned against simplifying those complex terms that users might find on service websites in text boxes or button labels. The strategy was to put the simplest term in brackets next to these words.

At a later stage, the first prototypes of the 17 diagrams (in flowchart form) were created, in collaboration with the civil servants in charge of the procedures, to ensure that all the information for accessing the services were included: summary description of the service (“What is it?”), documents required (“What do I need to have?”) and a description of all the steps (“What do I have to do?”). Furthermore, it was considered essential to include references for individuals who may have difficulty accessing the online service and require assistance from a public help desk (“Where can I get help?”).

These diagrams were then passed to the graphic designers who transformed them into visual diagrams by working on the layout and adding the graphic elements. They focused on creating accessible diagrams working on the legibility of the conceptual contexts (e.g., visually distinguish arrows with different functions), on the clearness of the design (e.g., sufficient white space and color harmonization) and on the text-image combinations (e.g., using images that also have a structuring function) [10].

The visual prototypes were then submitted to linguistic-cultural mediators for their evaluation through a questionnaire and an in-depth focus-group. Six mediators with migration backgrounds who

work daily in public offices assisting citizens from different countries⁶ participated in the evaluation of the diagrams. In this evaluation the linguistic-cultural mediators were asked to consider the comprehensibility for their audience with regard to the language and visual elements used, as well as the clarity of the diagram structure (especially concerning temporal, conditional, or cause-and-effect connections) and the use of colors to support the content meaning. The diagrams were subsequently adjusted based on feedback received from the mediators.

For instance, in terms of language, they recommended providing further clarification on certain terms that could potentially be misinterpreted (such as "working days"), while other technical terms, which were well-known to the intended audience (such as "counseling center" - a service frequently used by these users), did not require explanation.

As for the diagram structure, in order to make the reading direction better understood (keeping in mind that this can also differ according to language and culture), the mediators recommended adding arrows in some cases for clarification, and suggested adding numbers (which are international and therefore always suitable in an intercultural context) to better identify procedural steps.

Regarding the images, some recommendations included replacing icons that may not be universally recognizable to citizens (such as a globe to represent a website) and in certain cases incorporating realistic images instead of icons to improve comprehension (for instance, the image of a real medical prescriptions). It was also suggested by the mediators to add an icon next to the title of each diagram so that the topic being explained was immediately understood. Finally, on the use of colors in the layout, the Bangladeshi mediator recommended using brighter colors to attract users' attention and the Chinese mediator to limit the variety of colors used.

⁶ Albania, Kosovo, Morocco, Egypt, Tunisia, Syria, Libya, Algeria, China, Bangladesh, Pakistan, Nigeria, Mali, Ghana, Gambia, and Latin American countries.

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3

PRENOTARE LE ANALISI DEL SANGUE SU INTERNET






COME POSSO PRENOTARE LE ANALISI DEL SANGUE SU INTERNET?

SCAN ME  Puoi prenotare le analisi del sangue dal sito web della Regione Toscana <https://zerocode.sanita.toscana.it>

Attenzione: se devi prenotare una visita medica vai su: <https://prenota.sanita.toscana.it>

COSA DEVO AVERE PER PRENOTARE LE ANALISI DEL SANGUE SU INTERNET?

-  Codice fiscale
-  Numero telefono cellulare
-  Numero ricetta medica (NRE)

COSA DEVO FARE PER PRENOTARE LE ANALISI DEL SANGUE SU INTERNET?

Vai su: <https://zerocode.sanita.toscana.it>


- Scegli la Provincia e il Comune
- Scegli il posto dove vuoi fare le analisi del sangue
- Scrivi nelle caselle bianche
 - Il tuo codice fiscale
 - Il tuo numero di cellulare
 - Il numero della ricetta medica
- Scegli la data e l'ora
- Conferma la prenotazione
- Guarda e ricorda il numero della prenotazione

Il numero della ricetta medica sono i due numeri sotto il codice a barre in alto a destra della ricetta medica


RICETTA ELETTRONICA - PROMEMORIA PER L'ASSISTITO

0004 48000000*

Attenzione: è il numero con cui ti chiamano all'appuntamento


 Ti arriva un messaggio SMS con tutte le informazioni della prenotazione


Se non vuoi usare internet puoi telefonare al CUP (Centro Unico Prenotazioni) <https://prenota.sanita.toscana.it/documents/20182/0/Numeri+CUP/934a91b1-0d0f-4b2a-b862-acd3fc2fe559>

SCAN ME 

HELP

DOVE POSSO CHIEDERE AIUTO PER PRENOTARE LE ANALISI DEL SANGUE SU INTERNET?

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 URP della Regione Toscana www.regione.toscana.it/urp


 URP delle ASL
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 Toscana sud-est: www.usisudest.toscana.it/ufficio-relazioni-con-il-pubblico

Figure 1: The "How to book a blood test online" visual diagram prototype, revised after the linguistic-cultural mediators' assessment.

In a subsequent phase, comprehensibility testing was conducted with users.

The testing was carried out at the Immigration Office of the Municipality of Florence, where service users were assessed while waiting for their appointments.

Participants were asked to read one or two visual diagrams related to online services they were unfamiliar with. They were then asked to indicate unclear words or images and repeat the steps in their own words (paraphrasing testing). Additionally, they were instructed to locate specific information in the diagram or in some cases to access the actual online service using the information provided by the diagram (Task-based testing). Furthermore, they were asked to verbalize their thoughts while completing the assigned task (Think-aloud testing) [16].

The aim of the test was to identify any problematic aspects related to the content, language, and layout of the diagrams.

A total of 24 people were tested. They were from 13 different countries (Albania, Algeria, Bangladesh, China, Guinea, Honduras, India, Ivory Coast, Morocco, Peru, Romania, Senegal, Sri Lanka). Their ages ranged from 20 to 70 and their Italian language CERF⁷ level was approximately between A2 and B2. They have been living in Italy from 1 to 8 years.

4. Results and final considerations

The test participants' demographics were very varied as well as their Italian language skills, knowledge of the Italian public administration and familiarity with digital tools. However, all test participants demonstrated a full comprehensive understanding of the diagrams submitted to them (meaning they understood the function of the online service and how to access it).

Despite this, the test revealed critical elements that, in some cases, marred the understanding of specific or in-depth information. These elements must therefore be considered in order to improve the clarity of the informative diagrams with the target audience.

Regarding language, some words in the diagrams, although part of basic Italian⁸ were not understood by the users. This is because, as indicated in the literature⁹, the “easiness” of words cannot be established a priori in intercultural communication. For example, these are technical words that are common to native citizens but still unfamiliar to recent immigrants. In some cases, user testing also helped to identify synonyms that were more easily understood. In addition, some terms considered complex but useful for migrants to know were accompanied by a short description, which however was ignored during the test. This means that diagrams are not suitable to provide terminological definitions but rather only terms that can be easily comprehended by the intended audience.

Regarding the visual aspects of the diagrams, the test verified that some icons were not recognized (despite having passed the cultural mediators' verification), for example the “graduation cap” (to indicate training courses), an image that was not known by all test participants. Another example of an icon that was proved to be ineffective concerns a white exclamation point on an orange circle background used to mean “attention,” which is not a standard icon for this meaning.

Some issues also came up with the “glyphs” [17]. Specifically, the arrows that shifted the reading towards boxes with additional information were not visible enough. This is also related to structural problems because it was found that users skipped over information placed in such a way as to interrupt the vertical reading direction. This result is in line with diagram theory. We know indeed that when elements in graphics are ordered both horizontally and vertically, vertical arrays take precedence over

⁷ Common European Framework of Reference for Languages.

⁸ The basic vocabulary of Italian is a reference linguistic resource for contemporary Italian describing the most used and understood words of the language (see Chiari & De Mauro, 2014).

⁹ See Ahrens, S., & Fioravanti, C., (2022). Cultural implications in Easy Language texts for migrants. Theoretical considerations and insights from practice in Germany and in Italy. *Trans-kom* 15(2), 270–292.

horizontal ones [18]. Furthermore, it is recommended to base all communication on the vertical line because information placed horizontally can confuse people whose language reading direction is from right to left [10].

With regard to the accessibility of the diagrams, it was verified that the font size was too small for some readers. Some icons were also difficult to understand due to their small size, and insufficient color contrast was observed on two of the diagrams, making the text difficult to read. Lastly, the QR code system utilized to connect the diagrams to other informative web pages was not familiar to or utilized by the target audience.

Feedback from the design process, therefore, has already provided insights into the requirements of visual diagrams in this context and more will follow in upcoming tests.

It is however already possible to state that, among the results that have emerged so far, the choice of icons is particularly crucial when dealing with multicultural users such as those usually involved in basic services related to health, work, transport and economic aid. For this target group, as seen from the testing results, using ideograms is not recommended as they can have different metaphorical connotations in relation to different cultures or in any case, users may not understand the convention used [19]. It is preferable to use pictograms or at least to be sure that the meaning of ideograms is internationally recognized (e.g., by referring to international standards such as the ISO standard) [20].

Another very important aspect that emerged concerns the explanation of the technical terms used in the web interface of the online services. Since it is not possible, as we have seen, to clarify them within a process diagram, it would be necessary to simplify the terminology directly on the website. In many cases, this can be easily pursued because the technical terms used are often pseudo-technicism or collateral technicisms [21], meaning words that could be replaced by more common or simpler synonyms without any change in meaning.

These latter considerations are linked to an indirect result of the activity, namely the fact that public officers, collaborating in creating the visual diagrams, became aware of flaws in the interfaces of the online services as they themselves had to test them out. They realized, for example, there were complex terms that could be replaced and also unclear labels or buttons that were not visible. After this experience they reported these observations to the administrations in charge to be improved.

This indirect result also leads to a further reflection regarding the great usefulness of visualization techniques not only to communicate with the user about a service but also in the designing phase of a service itself. Visual techniques in fact, like journey maps or service blueprints, are widely used in User - centered design to put themselves in the user's shoes so as to understand how they would experience it [22].

It is finally worth noting that, even though the diagrams were originally intended for recent migrants, Tuscan municipalities have recognized (through a survey on the usefulness of the diagrams) their potential to benefit other vulnerable groups, like the elderly or people who are unfamiliar with using digital tools.

This insight is in line with the User-centered design approach which maintains that designing for "extreme target users"¹⁰ (the migrants in our case) can result in stronger work that can benefit a wider public [23].

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¹⁰ According to Hagan, extreme users are users "with an extreme problem, an extreme obsession with a thing, an extreme impairment, or is otherwise at the far end of a spectrum". See www.lawbydesign.co/en/design-mindsets

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