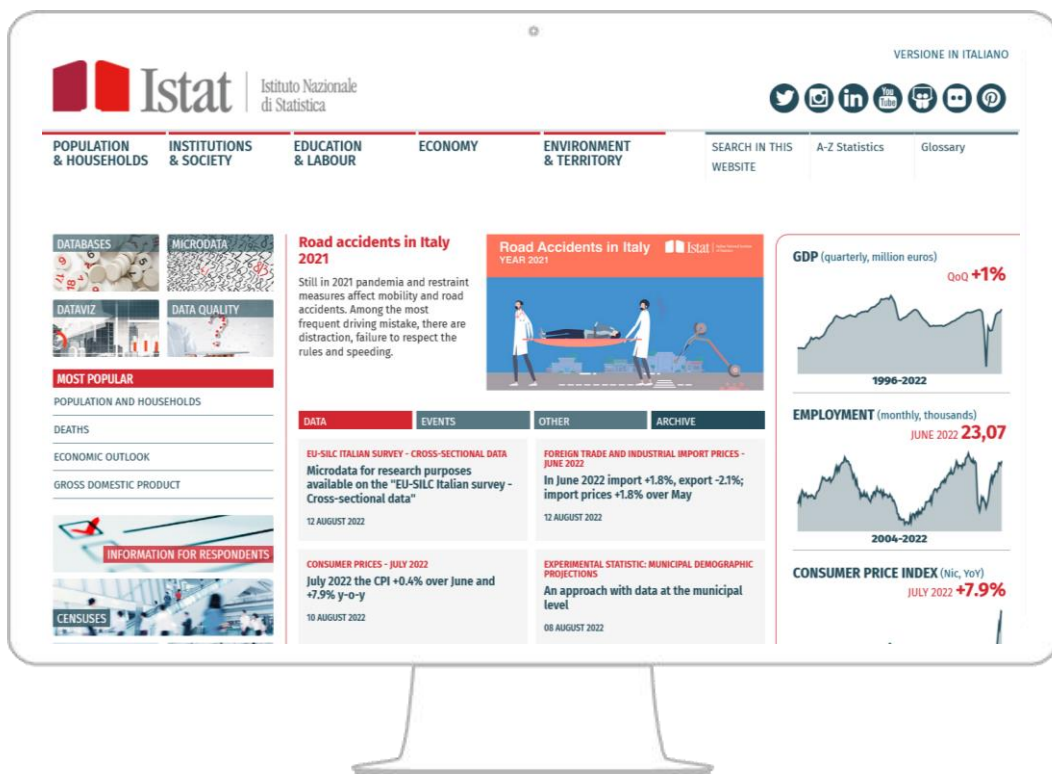


Human centred design and usability analysis for Istat institutional web site¹



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Human centred design and usability analysis for Istat institutional web site

Abstract

Istat has outlined a more user-centered communication strategy aimed at increasing its ability to reach experienced and less experienced users.

In line with this strategy, the web editorial team carried out usability tests on the institutional website to understand the views of users and better respond to their needs.

We conducted an in-depth analysis of the user experience of the institutional website, to investigate its critical issues and, with a view to continuous improvement, offer a site that is increasingly responsive to users' information needs.

We conducted three types of tests:

- o Moderated remote usability tests
- o Unmoderated remote usability tests
- o Remote user interviews.

Conducting three different types of tests provides complementary information.

What have we learned from these tests?

- Usability tests should be repeated periodically to make continuous improvement
- Through the usability tests we were able to make the existing site more user-centered
- Most importantly, we were able to identify some critical issues that have been solved in the current site and others that will be the starting point for the new site we have begun to design

In conclusion, thanks to the usability tests we have started to design a new site that will provide visitors with a more usable, more accessible, more flexible, more memorable, more useful digital experience tailored to the needs of users in both desktop and mobile navigation.

Key words: user' needs, usability, usability test

Sommario

Abstract	2
1 Introduction.....	5
2 How did we proceed?.....	5
3 Moderate remote testing.....	6
3.1 Goal.....	6
3.2 Main questions	6
3.3 Method	6
3.4 Sample - General characteristics	7
3.5 Usage Habits.....	7
3.6 Results of moderate remote testing	9
3.6.1 Results of single Task.....	9
3.6.2 Results of Homepage/General	12
3.6.3 Conclusions of moderate testing.....	13
4 Unmoderated summative tests.....	14
4.1 Goal.....	14
4.2 Method	14
4.3 Habits of use	14
4.4 Results	16
4.4.1 Task 1	16
4.4.2 Task 2.....	17
4.4.3 Task 3	18
4.4.4 Task 4.....	19
4.4.5 Task 5	19
4.4.6 Conclusions of moderate testing.....	20
5 Istat Website interviews.....	20
5.1 Goal and method.....	20
5.2 Sample - General characteristics	21
5.2.1 Usage habits	21
5.2.2 User Profile	22
5.2.2.1 User Profile - Low statistical proficiency	22

- 5.2.2.2 User Profile - Average statistical proficiency..... 23
- 5.2.2.3 User Profile - High statistical proficiency..... 24
- 5.3 Results 26
- 5.3.1 User needs regarding specific functions or information 29
- 5.4 Conclusions of Interview 29
- 6 Conclusions..... 30

1 Introduction

Istat wants to outline a more citizen-oriented strategy, involving the institutional website and aimed at laying the basis for building a new site that will be a real information hub: an essential point in the ecosystem of Official Statistics that is exhaustive, authoritative and above all accessible and usable. A new site that offers visitors a digital experience that is more usable, more accessible, more flexible, more memorable, more useful, oriented to the needs of users from both desktop and mobile devices with attention to the multichannel nature of the services offered.

To this end, starting from an in-depth analysis of the user experience of the on the current website, in general terms, we want to investigate the reasons for the known problems (e.g., the difficulty of people to find certain information within the subject areas) and obtain information on the main problems/needs encountered/expressed by current users.

2 How did we proceed?

To run an effective usability test, is very important to develop a solid test plan, recruit participants, and then analyze and report the findings.

First, we decided to carry out tests with 4 different target users, which represent the main user groups we have identified:

- A. Public Administrations (PA)
- B. Media
- C. Citizens
- D. Data analysts/data journalists and researchers.

Then, we chose to carry out three types of tests:

- Moderated formative remote usability testing, with 10 people (max 60 minutes per session), to investigate the main problems and needs with respect to User Interface design and Information Architecture.
- Unmoderated summative remote usability testing, with 40 people (max 20 min per session), to obtain benchmarks for the future system.
- Remote in-depth contextual usability interviews, with 38 people (max 60 min per session), to define and formalize user group profiles, usage scenarios, and high-level user needs for each identified profile.

Furthermore, we decided, due to the pandemic, to conduct all testing remotely.

The advantage of remote usability testing is that it allows research to be conducted with participants in their natural environment, where they are most comfortable, using screen-sharing software.

Which is best, moderated or unmoderated user testing?

There are advantages to both. In a nutshell, if you are looking for detailed feedback on complex or large websites and want to interact with user testers and ask follow-up questions, opt for moderated user testing. On the other hand, if you are looking for shorter and less detailed feedback on smaller websites, or perhaps have a smaller budget, go for unmoderated.

To maximize the insights you get from your user feedback it is often best to do both at the same time.

3 Moderated remote testing

Moderated remote testing aims to assess the quality of subjective interaction with the as-is system (perceived by users) by investigating the main problems and needs with respect to the interface and information architecture.

They were carried out between March and April 2021 on 18 users.

3.1 Goal

The specific goal of the moderated tests conducted is to assess the quality of subjective interaction with the desktop version of the as-is system, investigating the main problems and needs with respect to the web interface and information architecture.

3.2 Main questions

- What strategies do users adopt when searching for information?
- What difficulties do they encounter in finding information through thematic search?
- Is there information that users find superfluous and/or unclear?
- Is there information that users find very useful?
- Is there missing information that users would expect?

3.3 Method

We conducted ten remote testing sessions with the main categories of users. A moderator conducted the sessions (60 minutes) by assigning tasks and proposing questions to the participants, with the support of a clipboard attendant. We asked participants to share their screen so that the moderator could observe their interaction with the website.

Data collection lasted from March 1 to 5, 2021.

3.4 Sample - General characteristics

Participants: 10

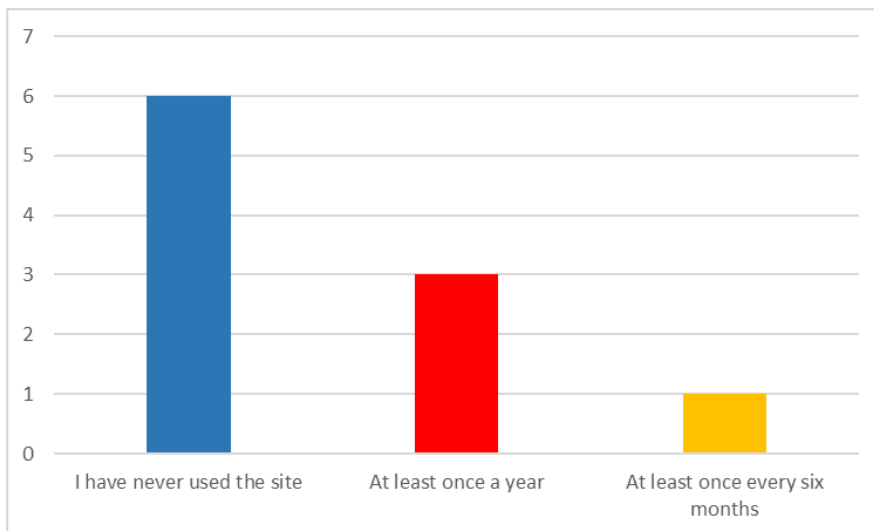
Gender: Women 50%, Men 50%

Average age: 39, 2 under 30, 5 between 30-49, 1 between 50-69, 2 over 70

Profile: Citizen (5), Academy (2), Media (2), Public Administration (1)

3.5 Usage Habits

- How often do you use the Istat site?



- For what activities do you use the Istat site?
 - Sample and marketing analysis (1)
 - Searching for general information (1)
 - Checking consumer price indexes (1)
 - Searching for data on mortality and incidence of specific diseases (1)
- What sites do you use in addition to or as an alternative to Istat.it?
 - Sites of regions or local authorities (1)
 - Irpet (1)
 - NCBI, PubMed (1)

Task 1

Find specific data or microdata

Goals

To find data related to pollution [PA; Media; Citizens].

To find microdata related to the living habits of individuals and households [data analysts/ data journalists and researchers].

Task 2

Find indices for monetary revaluations or data tables

Goals

To find indices for monetary revaluations [Media; Citizen].

To find data tables related to weather-climate changes in Italy [PA; data analysts/ data journalists and researchers].

Task 3

Find an infographic or census data

Goals

Find an infographic related to law enforcement [Media; Citizen].

Find census data on Italian industries [PA; data analysts/ data journalists and researchers].

Task 4

Find and investigate a news story

Goal

Find and investigate a news story related to tourism trends in Italy in 2020 [same goal for all targets]

Task 5

Find some data or microdata

Goals

To find data related to the eating habits of Italians [Citizens].

Find metadata related to the eating habits of Italians [PA; Media; data analysts/ data journalists and researchers].

3.6 Results of moderated remote testing

3.6.1 Results of single Task

Task 1 - Finding data or metadata

- Almost all users began their search for data from thematic topics and relied on the Search bar the site and "Statistics A-Z" search functions only in cases where an initial try to search by topic was unsuccessful.
- The first impact with the homepage was onerous for all users, as it was overloaded with information. It seems that after exploring the page they understood how it was organized, but had no idea what content to expect in each area and in what format.
- "For me, the Istat site is the numbers site, so I expect less text on the site. I expect more graphical elements, more tables, more data."
- Although accordions (expanding menus) have not created difficulties in navigation, they have created some perplexity in users:
 - they tend not to be seen or perceived as clickable elements;
 - it is unclear why the theme page (e.g., <https://www.istat.it/en/communication-culture-and-trip>, see image below) shows three results for the latest press releases and only one for other content;

The screenshot displays a vertical list of content items on the Istat website, each with a red header and a red horizontal line below it. The items are:

- COMUNICATI STAMPA**
 - Fiducia dei consumatori e delle imprese**
A febbraio indice del clima di fiducia consumatori da 100,7 a 101,4; fiducia imprese da 86,3 a 93,2
Periodo di riferimento: Febbraio 2021 | Data di pubblicazione: 25 febbraio 2021
 - Fiducia dei consumatori e delle imprese**
A gennaio indice del clima di fiducia consumatori da 101,1 a 100,7; fiducia imprese da 87,7 a 87,9
Periodo di riferimento: Gennaio 2021 | Data di pubblicazione: 28 gennaio 2021
 - Fiducia dei consumatori e delle imprese**
A dicembre indice del clima di fiducia consumatori da 98,4 a 102,4; fiducia imprese da 83,3 a 87,7
Periodo di riferimento: Dicembre 2020 | Data di pubblicazione: 23 dicembre 2020
- AUDIZIONI PARLAMENTARI**
 - Indagine conoscitiva su bullismo e cyberbullismo**
Audizione del Presidente Biagiardo alla Commissione parlamentare per l'infanzia e l'adolescenza
Data di pubblicazione: 27 marzo 2019
- CONTRIBUTI AL PARLAMENTO**
 - Indagine conoscitiva sulle forme di violenza fra i minori e ai danni di bambini e adolescenti**
Memoria scritta dell'Istituto nazionale di statistica
Data di pubblicazione: 08 giugno 2020
- PRODUZIONI EDITORIALI**
 - La vita delle donne e degli uomini in Europa**
La pubblicazione presenta un confronto tra la vita quotidiana di donne e uomini nei paesi europei
Data di pubblicazione: 12 novembre 2020
- INFOGRAFICHE**
 - Accessi al pronto soccorso con diagnosi di violenza**
L'Istat ha realizzato un'infografica in occasione della Giornata internazionale per l'eliminazione della violenza contro le donne.
Data di pubblicazione: 25 novembre 2020
- STATISTICHE SPERIMENTALI**
 - Social Mood on Economy Index**
Online i dati del quarto trimestre 2020
Periodo di riferimento: Anni 2016-2020 | Data di pubblicazione: 01 febbraio 2021

- it is unclear whether, after clicking on an accordion of a particular content category, further results can be reached by clicking on Archive.
- Some users complain about the presence of seemingly different types and formats of content on the same page and would expect it to be organized separately. ("The division of topics might be fine, but then I see a bunch of content together that doesn't seem organized.")

Task 2 - Find indices for monetary revaluations or data tables

- Small text and difficulty in reading. The user reads the content of the page by moving closer to the screen because the text is too small for him. He grasps the keywords, but does not seem entirely convinced that he is in the right area of the site (as opposed to the task) because of reading difficulties.
- Excessive steps to reach a piece of content. Once the user finds the information of interest (after several attempts), he comments that he finds the structure of the site inefficient to be able to find an information in a short time.

Task 3 - Finding an infographic or census data (video interaction)

- The label Visualizations seems to be poorly predictive of the information contained in this area. In fact, all users report that they would not have expected to find graphics, infographics, or map representations there. No user was able to find the infographic on their own without help. The users' first search attempt is the Justice and Security entry (the goal was to find an infographic on law enforcement). "I saw 'Visualizations' but I didn't think it was related to what I was looking for."



- Some users report that they would appreciate information about copyright and how to share, post, and use images on the site. Most users, however, believe that the images are public and that simply displaying the Istat logo is sufficient to use them freely.
- Although a couple of users manage to complete the task (finding census data on Italian industries), they complain about the excessive number of steps to get to the information, between 4 and 5, depending on the starting point (e.g., Censuses on the homepage or Enterprises in the subject areas).

- Often, after a keyword search, the system returns a page of results with similar, if not the same, titles. In these cases, the user has to read the subtitles and other descriptive information (e.g., reference period, document type, topic) to understand what a piece of content is about and how it differs from the others, slowing down the search.



DOCUMENTS TAGGED WITH: CONSUMER PRICES

CONSUMER PRICES (PROVISIONAL), SEPTEMBER 2021
 In September 2021 the CPI -0.1% compared with the previous month and +2.6% year-over-year
 Reference period: September 2021 | Date of issue: 30 September 2021
 Typology: PRESS RELEASE
 Themes: PRICES

CONSUMER PRICES - AUGUST 2021
 In August 2021 the CPI +0.4 over July and +2.0% y-o-y
 Reference period: August 2021 | Date of issue: 15 September 2021
 Typology: PRESS RELEASE
 Themes: PRICES

CONSUMER PRICES (PROVISIONAL), AUGUST 2021
 In August 2021 the CPI +0.5 compared with the previous month and +2.1% year-over-year
 Reference period: August 2021 | Date of issue: 31 August 2021
 Typology: PRESS RELEASE
 Themes: PRICES

CONSUMER PRICES
 In July 2021 the CPI +0.5% over June and +1.9% y-o-y
 Reference period: July 2021 | Date of issue: 11 August 2021
 Typology: PRESS RELEASE
 Themes: PRICES

CONSUMER PRICES (PROVISIONAL)
 In July 2021 the CPI +0.3 compared with the previous month and +1.8% year-over-year
 Reference period: July 2021 | Date of issue: 30 July 2021
 Typology: PRESS RELEASE
 Themes: PRICES

CONSUMER PRICES
 In June 2021 the Consumer Price Index +0.1 over May and +1.3% year-over-year
 Reference period: June 2021 | Date of issue: 15 July 2021
 Typology: PRESS RELEASE
 Themes: PRICES

Task 4 - Finding and investigating a tourism news story.

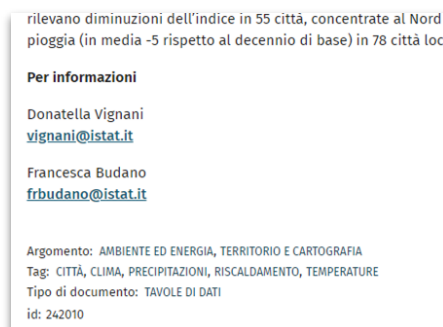
- Success in finding a news story. A person who explored the links in the middle of the page would have expected that the conjuncture web area and the database access would be more specifically about tourism (on par with the attachments), being in a detailed area.

Task 5 - Finding data or metadata.

- Difficulty in finding data on consumption habits. The user looks for data on alcohol consumption in "Daily Life and Citizen Opinion" without expecting to find it in "Health and Safety." In fact, he thinks of alcohol consumption as a habit and not as a health risk factor.
- Context and background information (e.g., publication period, publication date, attachments, contact information) are perceived positively and it is appreciated that they are all focused on one side and are immediately evident.
- However, it is not always clear to users from the label what content to expect (e.g., prospectuses, tables, glossary), and there is no indication whether the attachment will be downloaded automatically.



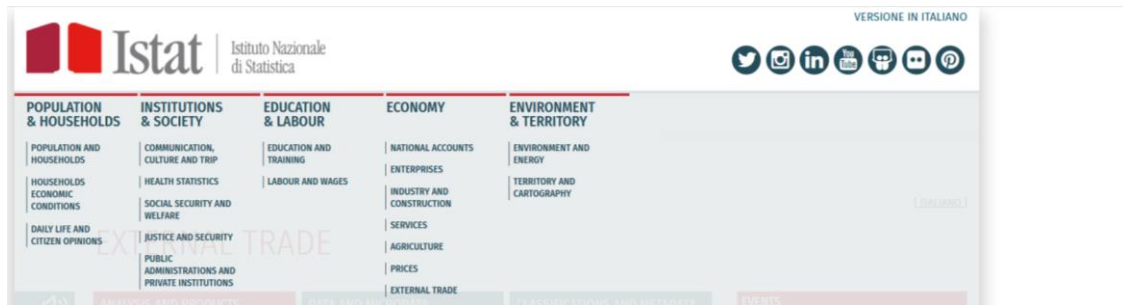
- Some users also note that there is not uniformity in the way contacts are organized on different pages of the site, sometimes being placed at the bottom of the body of the text and without a frame or label to make them clearly recognizable.



3.6.2 Results of Homepage/General

- The site has long loading times for pages and content.
- In addition, no feedback or messages are provided regarding page or content buffering, and users do not know if the system has received their input.
- Users show several difficulties in navigating the site due to the absence of commands to go to the previous/next page (having to rely completely on browser commands).
- The lack of the Home button creates disorientation, as experienced by several users who, when confronted with the researcher's request, did not know how to return to the homepage without using browser controls. In addition, only breadcrumbs are present for some paths, while in others they are absent.
- Although it is good that users rely on the thematic paths to start a search, it is nevertheless true that they immediately show difficulty in navigating them. This is either because:
 - the sub-items are considered too generic if one has specific search goals;
 - some content is placed in different areas from where users would expect it (e.g., infographics on law enforcement searched in Justice and Security rather than in Views, pollution rates searched in Environment and Land rather than in Daily Life and Citizen Opinions);
 - Population and households sub-items appear to users to be overlapping with each other.

- In general, it seems that the operation of the menu is not in line with the users' mental model:
 - they notice only after several searches that the same sub-items always appear, regardless of the menu item selected;
 - they would expect that only the sub-items of the main item selected would open or that, at least, there would be graphical markers to distinguish which menu item was selected (thus giving more prominence to its sub-items and less salience to the others).



- In the case of screens smaller than 15" or small windows (i.e., not set to full screen), menu sub-items lose their correspondence to higher-level categories.
- This can make it more difficult to reconnect sub-items to their respective menu items and select the sub-item of interest for a search.
- A similar problem occurs when opening the three search filter categories together (i.e., Document Type, Topic, Region): the box in which they are contained extends to overlap the footer.

3.6.3 Conclusions of moderated testing

- Reliability of the source. Istat is considered to be an authoritative and reliable source for users, who nevertheless prefer to rely on search engines to find specific Istat data instead of looking for it on the institutional website, as they are more confident of reaching the information of interest in a few steps.
- Perception of content. On the homepage and in thematic areas, users find it difficult to distinguish between different types of content (e.g., press releases, editorial productions, data tables), which are presented in similar formats to each other, and they cannot understand whether there are hierarchies among them. In general, they have the impression that data, the content they would expect to be more prominent, is placed second to descriptive texts.
- Effectiveness of search functions. Since it is not always clear to identify in which macro-category to search for a specific topic, users would expect search functions to be more effective in returning results.
- Language familiarity. Regardless of the level of statistical awareness, users would like to see the adoption of language that is less technical and institutional (e.g., visualizations, microdata, classifications, experimental statistics) and more familiar, which can support searching and distinguishing different content.

4 Unmoderated summative tests

The data collection lasted from March 15 to 19, 2021.

4.1 Goal

The specific objective of this type of test is to evaluate the quality of interaction with the desktop version of the as-is system by investigating objective and subjective dimensions of the user experience.

Specifically:

- the performance (success and time) of performing the main tasks on the system;
- the perceived effortlessness in performing tasks;
- the perceived safety in completing tasks;
- the perceived overall usability;
- the perceived propensity to use the system;

4.2 Method

A sample of 40 users with characteristics defined in the design phase of the study was involved within an unmoderated remote usability test. To achieve the task, participants were asked to use Loop11 software to record video and audio of interactions (30 min) and perform tasks on the site and answer questions. A questionnaire on overall experience with the site was then conducted.

Participants: 40

Gender: Women 50%, Men 50%

Average age: 39 years, 14 under 30 years, 16 between 30-49 years, 10 between 50-69 years

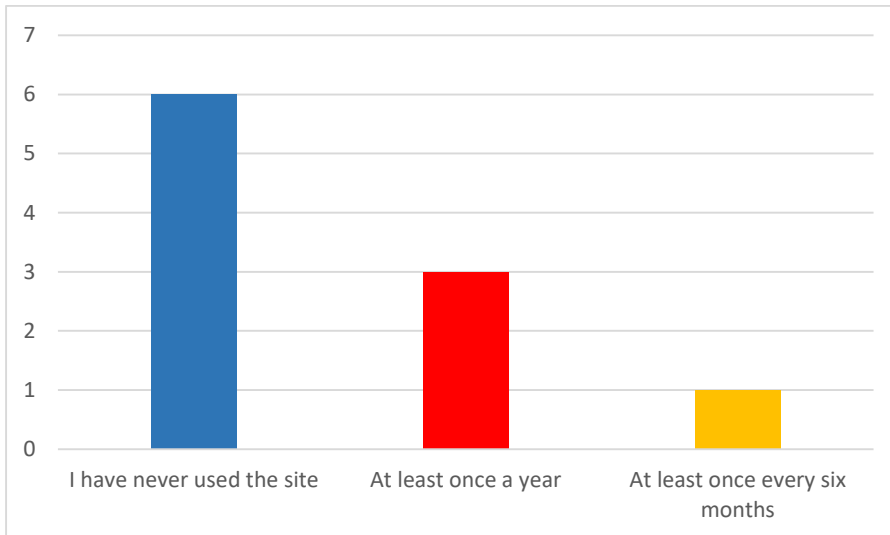
Profile: Citizen (20), Academy (10), Business (3), Media (3), PA (2),

Data analyst (2)

N.B. Although not the specific subject of the test, it was possible to retrospectively identify 3 participants from the "Business " segment.

4.3 Habits of use

How often do you use the Istat site?



For what activities do you use the Istat web site?

- Personal interest (7)
- University papers/project work (5)
- Researching demographic and population data (3)
- Searching for data on agriculture and economic basket (1)
- Researching information on enterprises (1)
- Article writing (1)
- Market research (1)

What sites do you use in addition to or as an alternative to Istat.it?

- Wikipedia, Google or Google Trends (7)
- Newspaper sites (4)
- DBs of private companies (e.g., Nielsen, IQVIA) (3)
- Sites of municipalities and regions (2)
- Government sites (e.g., Government.it, Min. Health) (2)
- Repositories of scientific papers (1)
- Osservatori.net (1)
- Censis (1)
- EU databases (1)
- None/Not looking for statistical information (14)

Task 1 - Goals

1A - Find data on pollution in Italy [stated statistical competence LOW].

1B - Find microdata related to household living habits [stated statistical competence HIGH].

Task 2 - Goals

2A - Find indices of monetary revaluation [stated statistical competence LOW]

2B - Find data tables related to weather-climate changes in Italy [stated statistical competence HIGH]

Task 3 - Goals

3A - Find an infographic related to law enforcement [stated statistical competence LOW]

3B - Find census data on Italian industries [stated statistical competency HIGH]

Task 4- Goal

Find a news related to the trend of tourism in Italy in 2020 [unique version]

Task 5- Goal

Find and download an e-book on the health situation in Italy [unique version].

4.4 Results

4.4.1 Task 1

Task 1A - Find some data or metadata.

You are thinking of relocating and would like to figure out which regions of Italy are most livable.

Find data on the level of pollution in the regions of Italy.

Goal: <http://dati.istat.it/Index.aspx?QueryId=24093#>

Metrics

0 out of 20 users found the pollution data (0%) and spent about 9 min in the search before finishing the task without reaching the goal.

Failing users often searched in Environment and Energy or reached Land Report 2020.

The low subjective ratings, testify to users' difficulties in searching for content that could potentially be found under multiple "themes" and thus compete with related information (e.g., pollution data could be found the Environment and Energy or Land and Cartography according to users' mental models).

Task 1B

For a project you have been commissioned to do, you need to do an analysis on the lifestyle habits of Italians.

Find processable data (i.e., data that you can use to do analysis on a spreadsheet) related to the lifestyle habits of citizens and download it to your PC.

Goals:

- <https://www.istat.it/it/archivio/129956>
- <https://www.istat.it/it/archivio/129916>

Metrics

4 out of 20 users found data related to the lifestyle habits of Italians (20%) and spent just over 6 minutes in the search before finishing the task. Failing users often searched Databases and Information Systems or Basic Statistics.

They also rated the task as on average easy (4.3/7) and expressed a degree of confidence with respect to completing the task (5.3/7). These ratings are relatively high compared to the success rate, and this is due, in particular, to the fact that they imagine finding the information in the I.stat database rather than in Microdata.

4.4.2 Task 2

Task 2A

Your homeowner has told you that starting this year the rent for your apartment will cost more because the rent has been revalued with Istat values.

Check that consumer prices compared to last year have increased.

Goal: <https://www.istat.it/it/archivio/30440>

Metrics

4 out of 20 users found consumer price revaluation indexes (20%) and took about 7 min in searching before finishing the task. Failing users often searched through the Site Search using keywords such as "Consumer Prices," "Rents," and "Rent." Although users rated the task as tending to be easy (4.5/7), expressing a confidence level with respect to completing the task of 5.2/7. These ratings are high when compared to the actual success rate, and this is because they find information that they feel is a substitute for the information they are looking for (e.g., Consumer Price System or Consumer Price Basket) or do not understand, when they find it, that the Monetary Revaluations page contains the information they are looking for.

Task 2B

You are conducting an analysis of climate change in Italy over time.

Find data on weather-climate changes over the past decades in Italian cities and save it to your PC.

Objective: <https://www.istat.it/it/archivio/251803>

Metrics

5 out of 20 users found data on climate change in Italy (20%) and spent about 3 minutes in the search before finishing the task without reaching the goal. Failing users often searched through the Site Search using keywords such as "Surveys," "Climate." Users rated the task as moderately difficult (3.7/7), expressing a confidence rating of 4.9/7. The confidence rating is relatively high when compared to the actual success rate, and this is due to the fact that they find information that they feel is a substitute for the required information (e.g., they stop at press releases related to climate change instead of considering data tables).

4.4.3 Task 3

Task 3A

Your neighbor's son is doing a research paper on law enforcement for school and has asked you to help him. He would like to enrich the research with a picture.

Find an image that shows data about law enforcement (e.g., Police, Army).

Goal: <https://www.istat.it/it/archivio/251477>

Metrics

0 out of 20 users found the infographic (0%) and spent about 6 min in the search before finishing the task without reaching the goal. Failing users often searched in Justice and Security, PA and Private Institutions or through A-Z Statistics using keywords such as "Security," "Law Enforcement," "Justice." Users rated the task as difficult (1.9/7), expressing a low degree of confidence with respect to task completion (2.5/7) consistent with the actual success rate. This could be explicable in light of the fact that the easiest route to infographics is to search by format (through Views), however, participants almost always preferred to search by topic (also true for the other tasks).

Task 3B

You are doing an analysis on Italian business innovation and a colleague pointed you to documents published by Istat on the business census.

Find the insight related to digitization and technology in Italian enterprises and download it to your PC.

Goals:

- <https://www.istat.it/it/archivio/246548>
- <http://dati-censimentipermanenti.istat.it/>

Metrics

1 in 20 users found the in-depth study on enterprise digitization (5%) and took about 4 minutes to finish the task. Failing users often searched in Basic Statistics, Enterprises, Household Economic Conditions. Users

rated the task as moderately difficult (3.3/7), expressing a confidence level with respect to completing the task 4.5/7. Both ratings are high when compared to the actual success rate, and this is due to the fact that they find information that they feel is a substitute for the required information (e.g., they stop at press releases and other content related to business and technology, rather than considering data on the permanent census).

4.4.4 Task 4

You have heard a lot lately about the decline of tourism in Italy and would like to learn more about it.

Find news about tourism trends in Italy in 2020 on the Istat website.

Goal: <https://www.istat.it/it/archivio/252091>

Metrics

17 out of 40 users found the news about the movement of tourism in Italy (46%) and took just under 2 minutes to finish the task. The keyword "travel" in Culture, Communication and Travel and being among the featured content in Press Releases supported in the search. Failing users often searched in Businesses or through Statistics A-Z. Users rated the task as easy (5.2/7). They also expressed a high degree of confidence with respect to completing the task (6.0/7), consistent with the actual success rate, which, although not high, is still higher than the other tasks. The performance and ratings of the two groups of users appear to be similar to each other.

4.4.5 Task 5

You are trying to get an idea of Italy's health situation one year after the start of the pandemic, but news reports and articles do not seem like comprehensive sources. You've read that Istat released its annual report on Italy's health trends over the past year and want to learn more.

Find the "Annual Report 2020 - The State of the Country" and download the part about the health situation.

Goals:

- <https://www.istat.it/it/archivio/244848>
- <https://www.istat.it/storage/rapporto-annuale/2020/capitolo2.pdf>

Metrics

21 out of 40 users found the e-book (53%) and took just under 3 min to finish the task. Failing users often searched in Health and Health or were confused with the Fair and Sustainable Welfare Report. Compared to other cases, here the search functions supported users in finding the content. Users rated the task as easy (4.6/7). They also expressed a high degree of confidence with respect to completing the task (6.0/7), consistent with the actual success rate, which, although not high, is still higher than that of the other tasks. The ratings of the two user groups are similar to each other, while a higher success rate is found in the "high statistical proficiency" group (65 percent vs. 40 percent).

4.4.6 Conclusions of moderated testing

- The low success rate, compared to the generic literature benchmark, and the prolonged times testify to a cross-sectional difficulty (independent of level of statistical proficiency), in finding information on the site.
- In general, the subjective judgments are consistent with what emerges from the objective metrics and confirm the impressions gained from the qualitative questions and the formative test.
- In some cases, the ratings of ease or confidence in successful completion of the task are high, or at least in line with benchmarks, in the face of low success rates and high turnaround times. This is determined by the fact that users, not having definite expectations about the form in which to expect the data, often locate information that they believe is equivalent or similar to what they are looking for, but which would not fully meet their search goals.
- Despite the fact that its information offerings are considered to be of quality, the site is likely to be less attractive than others, which manage to create better differentiation between information, spaces and navigation modes by targeting experts and non-experts: this is mainly due to limitations of search functions and an organization of content that does not conform to users' mental models.

From the analysis of the results of these tests, several points emerge to be used as a basis for redesign:

- The homogeneity of the site's pages (not to be understood as content format, which is expected to be different depending on the type of editorial content), which restores a sense of consistency while browsing;
- The quality and granularity of the information, which would offer the possibility of more effectively distinguishing paths and information according to the user's level of statistical expertise and in-depth objectives.
- The menu with thematic headings, which offers an effective direction to begin the search with a topic in mind, but which must be supported by a familiar and orderly information architecture in the underlying levels as well, and functions that would allow the search to be refined effectively depending on the granularity of the information available and/or desired.

5 Istat website interviews

User interviewing is a method during which a researcher asks a user questions about a specific topic and notes his or her answers, with the goal of learning about that topic.

Data collection lasted from April 19 to April 30, 2021.

5.1 Method and goals

A moderator conducted eighteen remote interviews with the main categories of users of interest during sessions of about 60 minutes, proposing questions and prompts to the respondents (in some cases, asking them to share their screen), supported by recording the responses.

The specific goals of the interviews were:

- to know the users needs in relation to the activities they do most frequently

- to understand what features are missing in the current site
- delve deeper into the context of use of the institutional site
- define and formalize user group profiles
- learn about the high-level scenarios and needs for each identified profile.

5.2 Sample - General characteristics

Participants: 18

Gender: Women 6, Men 12

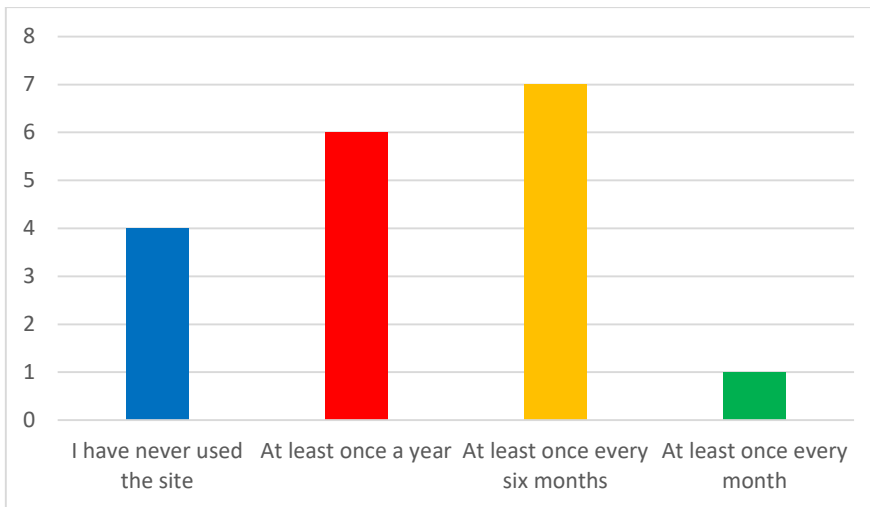
Average age: 33 years old, 9 under 30 years old, 8 between 30-50 years old, 1 over 50 years old

Profile: PA (1), Information (1), Business analyst (3), Academy/Research (5), Data scientist/analyst (8)

N.B. Although not the specific subject of the test, it was possible to retrospectively identify 3 participants from the "Business" segment.

5.2.1 Usage habits

How often do you use the Istat site?



For what activities do you use the Istat site?

- Research or university papers/project work (5).
- Researching information on economics and finance (3)
- Researching demographic and population data (2)
- Personal interest (2)
- Researching data on environment and land (1)

What sites do you use in addition to or as an alternative to Istat.it?

- Open data (e.g., Kaggle) (5)
- EU databases (e.g., Gender Statistic Database, European Data Portal) (2)
- Sites of regions/provinces/municipalities (1)
- Government sites (e.g., Ministry of Health, Bank of Italy, Tuttitalia) (3)
- Financial field sites (e.g., Il Sole 24 Ore, World Bank, Yahoo Finance, Pitchbook, Crunchbase, AIDA BVDInfo) (3)

5.2.2 User Profile

5.2.2.1 User Profile - Low statistical proficiency

- Has no specific training with respect to statistics;
- does not delve into the data found;
- benefits from data that has already been worked on, discussed, summarized (best if example visualizations are present);
- uses statistical information and visualizations to inquire about certain phenomena in society;
- when doing research is motivated by personal interests and curiosity.

Profile

- Citizens
- Information
- Teachers

Sources

- Google
- Generalist sites

Quality criteria

- Authoritativeness of the source

Tools

- None

Formats

- xlsx
- pdf

Storage and sharing

- locally
- Mail

5.2.2.2 User Profile - Average statistical proficiency

- Has no specific training with respect to statistics;
- benefits from already processed, discussed, synthesized data (best if example visualizations are present);
- may be familiar with databases and operations of basic calculations and descriptive statistics and with creating dashboards and graphs;
- uses statistical data to understand the market and population behavior (especially consumer behavior), make budgets and economic forecasts;
- when doing research is motivated by business interests.

Profile

- Organizational consultants
- Business and financial analysts
- PA

Sources

- Industry sites
- Istat
- Business data (self-generated)
- Sites of regions, provinces, municipalities
- Government sites
- Plus all those in the previous profile.

Quality criteria.

- Presence of up-to-date data.
- Plus all those in the previous profile.

Tools

- Excel
- Tableau
- Looker (Google)

Formats*

- CSV

Storage and sharing*

- external hard drives
- Onedrive
- Dropbox
- Teams
- GDrive

5.2.2.3 User Profile - High statistical proficiency

- Has specific training with respect to statistics (e.g., bachelor's degree in statistics, master's degree data science);
- is proficient in researching, cleaning, reading, and analyzing statistical data;
- regularly uses DBs, datasets, and pre-built tables or creates his/her own;
- knows programming languages and mark-up;
- uses statistical data for project work, academic and clinical research, publications, or to create predictive models, algorithms, and software.

Profile

- Academy and research

- Data analyst and scientist

Sources

- European databases
- DB Open data
- University DBs
- Research organizations/centers
- Plus all those in the previous profile

Quality criteria

- Granularity of the data.
- Formatting of the dataset
- Presence of info on methodology and variables
- Same data cited from other sources
- Plus all those in the previous profile

Tools

- Enterprise software
- R Studio
- Stata
- SAS
- MATLAB
- Jupyter NB
- ML Azure
- Plus all those in the previous profile

Formats

- json
- txt
- svg
- Plus all those in the previous profile

Storage and sharing*

- Python environment
- DB University
- WeTransfer

User needs were defined, understood as prerequisites identified as necessary for a user, or group of users, to achieve a given goal, implicit or explicit in a specific context of use (ISO/IEC 25064:2013)

The identified user needs were then classified by type.

5.3 Results

User needs were defined, understood as prerequisites identified as necessary for a user, or group of users, to achieve a given goal, implicit or explicit in a specific context of use (ISO/IEC 25064:2013).

The identified user needs were then classified by type:

Informational need - refer to specific information that is important or necessary to perform a certain activity or achieve a goal (i.e. what information the user needs to be able to know).

Procedural need - refer to specific procedures that are important or necessary to perform a particular activity or achieve a goal (i.e. what procedure the user needs to be able to perform).

User needs are independent of any design solution. They are just an expression of what the user lacks and would need to achieve their goals and perform their activities

1. Data preview

Since there is a lot of data available and on many sources, the user expresses the need to preview data or do preliminary analysis to quickly and accurately decide which ones to download and work on externally.

Informational need

The user has a need to know the main information about each survey, through a concise description (e.g., abstract format), in order to interpret the data:

- starting hypotheses (where present);
- characteristics of the target population and sample;
- methodology and instruments used for collection;
- survey scale (e.g., municipal, regional, national);
- class construction criteria;
- criteria for choosing variables;

Procedural need

The user has a need to write code to query the Istat database and pre-process the data to understand how it is distributed and consider downloading it (Ed. perhaps with the ability to make public/share one's own query and see the one made by others).

Applies to users with expertise: HIGH

Informational need

The user has a need to:

- have a concise description and/or preview of the main information and data contained in the attachments to check how they are structured, how they are distributed, and what variables are involved, without having to download or open them;
- not losing information about the last datasets or content consulted, queries made, and keywords used (Editor's note: currently, users simply do not clear the history or save page URLs-even of others-in bookmarks);
- to know the number of results of a search made through the Search on the site, to assess how deeply they delve into a particular topic on the Istat site;

Procedural need

search for data and content through time references (i.e., publication date, survey date, "from... to..." time range) to be able to isolate the most recent ones or to find only those related to a given period.

Applies to users with expertise: HIGH and MEDIUM

"I would add filter by period or year; if I have to go to 2020 results or earlier years I have to scroll through several pages. (data scientist)"

2. Document type labels

The user recounts his difficulties in understanding the differences between different document types. This may impact his ability to define which document is most useful to consult for his goals

Informational need

The user has a need to:

- know for each domain or survey (where possible) when the last survey took place and when a new survey and/or release of new data is planned, so as to assess whether to reference/analyze the data already available or wait;
- know the role and on-call hours of Istat contact persons to be contacted to request data and/or additional information with respect to a survey;
- distinguish between different types of documents (e.g., hearings, editorial productions, call for papers) so as to assess which one to consult with respect to a given topic;

Procedural need

The user has a need to:

- generate the DOI of each content page and create its bibliographic or sitographic reference (e.g., citing in APA or MLA format);

- search for data and content through broader "Region" references (e.g., North, Central, South) to locate all those referring to an entire geographic area.

Applies to users with proficiency: HIGH and MEDIUM

"There is so much text, why not make a summary chart? [Editor's note. referring to the detail page of a survey] It is OK to have a text part, but it would be nice to have graphical feedback of what you are talking about as well. (data scientist)"

3. Formatting tables and datasets

The user reports some difficulties related to formatting tables and datasets that often do not lend themselves to immediate analysis through tools and software, but must undergo reformatting.

Informational need

The user has a need to:

- have dynamic visualizations and/or synthetic data that change over time (e.g., <https://www.worldometers.info/it/>) related to the main phenomena or dimensions of interest to the Italian population (e.g., how many people travel, are born);
- knowing the size of exportable datasets and attached files to decide whether to download them;
- know what files are in a folder attached to a piece of content before downloading it;

Procedural need

- to have exportable datasets and content in open data formats in order to read them with open source programs (e.g., LibreOffice):

- o .odt - for a text document

- o .ods - for a spreadsheet

- o .odp - for a presentation file

- o .odg - for an illustration or drawing

Applies to users with proficiency: HIGH and MEDIUM

"Tables look like content for reference rather than files that can be reprocessed or launched on a software... (Researcher)"

Search mode

The user confirms the tendency, for those who do not have a strong need for in-depth study or cannot find a piece of data quickly, to rely on a search through search engine or change data source.

5.3.1 User needs regarding specific functions or information

- Have graphs rotate on the homepage so that different indicators are displayed periodically, rather than just GDP per capita, resident population, and employment rate;
- in Search the site to be able to reset all filters without having to deselect them individually;
- to have graphs and visualizations (at least the main ones or the summary ones), in addition to the descriptive text of the survey, where present in the attachments;
- for cartographic information, having historical photos and/or photo sequences to make comparisons with respect to changes in an area;
- being able to sort the results of a search in the Document Archive (e.g., by date of publication or update, alphabetically);
- have a function along the lines of Google's I'm Feeling Lucky for those who are motivated by curiosity and are exploring the site without a specific search goal;
- have a catalog of database sites and other Italian and foreign data sources deemed authoritative by Istat (including universities and PA DBs);
- in Statistics A-Z, on each tagged Documents page would be useful search and filter results functions.

The search is not free, but only certain keywords can be used. So I do not understand why the site does not give me those available directly instead of showing me a search field. (Data analyst)

5.4 Conclusions of Interview

Confirmation of the themes that emerged from the tests:

- authoritativeness of Istat as a data source;
- language and functions that do not adequately support the search for content of interest;
- site lacking hierarchies and saturated with textual information that puts data in the background;
- search for Istat data from a search engine rather than the site.

Medium-skill and low-skill users

What most impacts their experience with data sources is the difficulty in finding summary or, conversely, granular data at the spatial level. However, unlike more experienced users, who may try to reconstruct a piece of data, perhaps by cross-referencing multiple sources, if they do not find a piece of data of interest, they search through other sources or change the subject of their search and analysis.

High-skill users

What slows them down the most is having to normalize/reformat data in order to work on the software they use. They charge for such operations, but often lack the information they need to understand the survey scope, how variables are chosen, and how rows and columns of the dataset are constructed. For

those who work with data on a daily basis, it is important to arrive at clear, well-formatted datasets in just a few steps.

Depending on the type of expertise and goals, two ways through which users expect to navigate data source sites can be identified:

1 Leanback, Passive, not goal-oriented:

- using statistical information preferably through numerical indicators as opposed to textual ones;
- summary tabular or graphical displays, perhaps dynamic, to explore a phenomenon;
- guiding the discovery (even gradual) of the different contents of the site.

2 Leanforward, Active, oriented by hypotheses or research objectives;

- immediate availability of dataset with raw data;
- dataset and data construction information to enable data preparation and cleaning (off-site);
- reaching out and cross-referencing other sources against the same dataset for possible additions.

6 Conclusions

- Usability tests should be repeated periodically to work in continuous improvement cycle
- we were able to make the existing site more user centered
- we have been able to identify some critical issues that have been overcome in the online site and others that will be the starting point of the new site that we have started to design

A **new web** site that offers a digital experience for visitors that is

- more usable
- more accessible
- more flexible
- more memorable
- more useful
- oriented to the needs of users both in desktop and mobile navigation.