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M.Sc. Computer Science and Engineering  
Hypermedia Applications Project

# Usability Report



[www.reply.com](http://www.reply.com)

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## **Abstract**

The aim of this Usability Report is to describe the results of the usability assessment carried out on the Reply website. Specifically, the analysis is performed using first the Inspection method and then the User Testing method.

The first method involves expert evaluators examining the application interface and evaluating its compliance with recognized usability principles called heuristics. Specifically, the analysis is conducted with reference to the Nielsen and MILE heuristics.

The user testing method instead consists of the data collection and observation of how some representatives of real users interact with the system. Its goal is to discover the actual difficulties encountered by users when interacting with the website and to obtain systematic feedback on its effectiveness and use.

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# 1 Inspection

Usability inspection is the generic name for a category of methods based on having expert evaluators analytically examine UX-related aspects of an application. Typically, usability inspection is aimed at finding usability problems in a design, though some methods also address issues like the severity of the usability problems and the overall usability of an entire design. Here we focus on *Heuristic Evaluation*, an inspection method that involves evaluators examining the interface and judging its compliance with recognized usability principles (the "*heuristics*").

## 1.1 Inspection Design

### 1.1.1 Heuristics Definition

This section precisely defines the heuristics used to conduct the inspection. Specifically, the analysis refers to the principles outlined by the *Nielsen* and *MILE* heuristics.

#### 1.1.1.1 Nielsen Heuristics

Jakob Nielsen's heuristics are the most-used usability heuristics for user interface design. Released in 1994, they define the following principles:

- **Visibility of system status:** the design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.
- **Match between system and the real world:** the system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.
- **User control and freedom:** users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.
- **Consistency and standards:** users should not have to wonder whether different words, situations, or actions mean the same thing. Follow "platform" conventions.
- **Error prevention:** even better than good error messages is a careful design that prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.
- **Recognition rather than recall:** minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
- **Flexibility and efficiency of use:** accelerators - unseen by the novice user - may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
- **Aesthetic and minimalist design:** dialogues should not contain information that is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
- **Help users recognize, diagnose and recover from errors:** error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
- **Help and documentation:** even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such

information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

### 1.1.1.2 MILE Heuristics

MILE is a scenario-based inspection technique that includes a large number of heuristics. For the execution of the analysis, only the following subset is considered:

#### **Navigation heuristics**

- **Interaction consistency:** do pages of the same type have the same links and interaction capability?
- **Group navigation:** is it easy to navigate from and among groups of “items”? E.g., from the “list of items” of a group to its “members” (and the other way around); among different “groups”; among members of the same group (next/previous).
- **Structural Navigation:** is it easy to navigate among the “components” (parts) of a topic?
- **Semantic Navigation:** is it easy to navigate from a topic to a related one (in both directions)?
- **Landmarks:** are “landmarks” useful to reach the key parts of the web site?

#### **Content heuristics**

- **Information overload:** is the information in a page too much/too little?

#### **Presentation heuristics**

- **Text layout:** is the text readable? Is font size appropriate?
- **Interaction placeholders-semiotics:** are textual or visual labels of interactive elements “expressive”? i.e., do they reflect the meaning of the interaction and its effects?
- **Interaction placeholders-consistency:** are textual or visual labels of interactive elements consistent in terms of wording, icon, position, etc.?
- **Spatial allocation:** is the on-screen allocation of contents and visual elements appropriate for their relevance? Are “semantically related” elements close and “semantically distant” element far away?
- **Consistency of Page Structure:** do pages of the same type have the same layout (same visual properties of each component and similar organization and layout of the various elements)?

### 1.1.2 Metrics Definition

The metrics used for the inspection are defined as follows:

Metric	Description
N/A	Not applicable.
0	The heuristic is <b>not satisfied</b> ; severe violations have been detected.
1	The heuristic is partly satisfied, the website is structured adequately according to the heuristics, but they are implemented in the wrong way.
2	The heuristic is partly satisfied but it can be massively improved.
3	The heuristic is almost satisfied. There are several imperfections.
4	The heuristic is almost fully satisfied but there are some imperfections.
5	The heuristic is <b>fully satisfied</b> ; no violation has been detected.

### 1.1.3 Evaluation Process Definition

The inspection is carried out as specified in this section. First, each expert evaluator individually carries out an in-depth analysis of the website by referring to the previously defined heuristics and metrics. By doing this, a time of at least 15 minutes will be dedicated to each of the main sections. All the detailed reports of these analyses are given in the *Inspection Annex*. The results are then discussed among all the inspectors to reach a shared agreement on comments and scores.

The usability evaluation is carried out on the entire website, with particular attention to the following pages and sections:

- *Homepage*
- *Topics Section*
- *Industries Section*
- *Careers Page (Join)*
- *About Page*
- *Investors Page*
- *Newsroom Page*
- *Personal Profile Page*
- *Search Page*

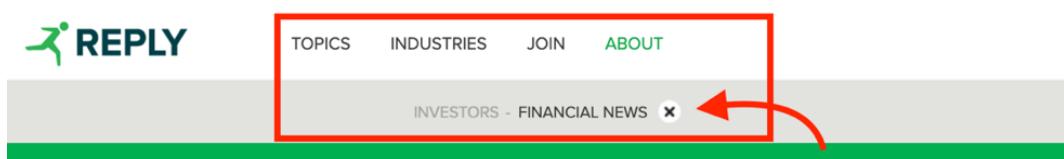
## 1.2 Inspection Execution

### 1.2.1 Execution

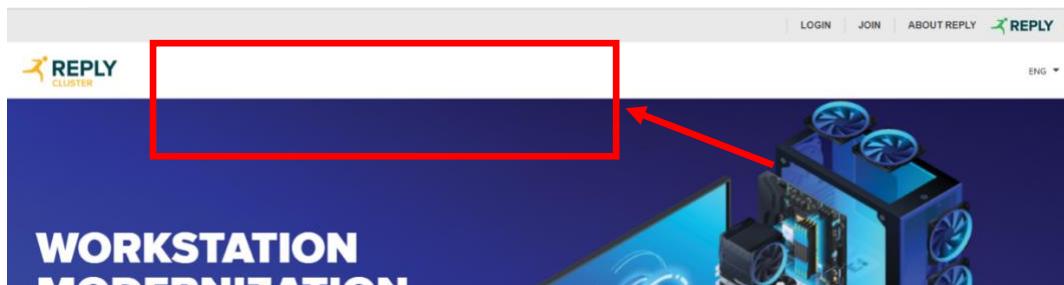
This section reports the results of the inspection process defined above with the precise details of any identified problem. In the following multiple explanatory screenshots of these criticalities are also provided.

Heuristic Type	Heuristic	Overall Score
Nielsen	Visibility of system status	1

The breadcrumb is visible on some pages so that the user can know where he/she is. However, it is badly implemented. The problem is that the breadcrumb is not effective: in each section, it shows only the name of the current section and an 'X' icon, without giving further details about the top-level section (Screenshot 1). Furthermore, in certain pages the breadcrumb disappears completely, leaving the user with no information about the current state as can be seen from Screenshot 2.



Screenshot 1: <https://www.reply.com/en/investors/news/>



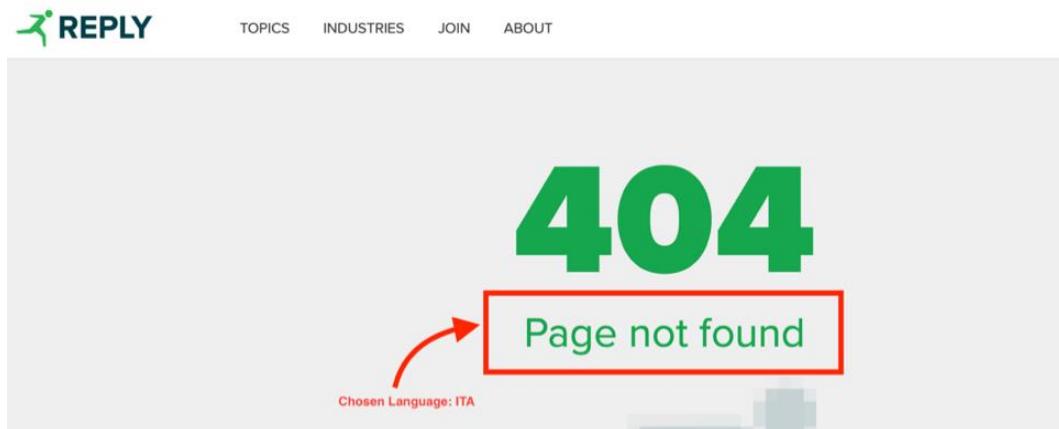
Screenshot 2: <https://www.reply.com/cluster-reply/en/drive-value-with-windows10-and-sccm>

Heuristic Type	Heuristic	Overall Score
Nielsen	Match between system and the real world	3

As highlighted in Screenshot 3 and Screenshot 4, the main problem with this heuristic is related to the partial translation of the website. Indeed, the navigation bar, the search bar and all the error messages are shown in English, regardless of the language chosen by the user.



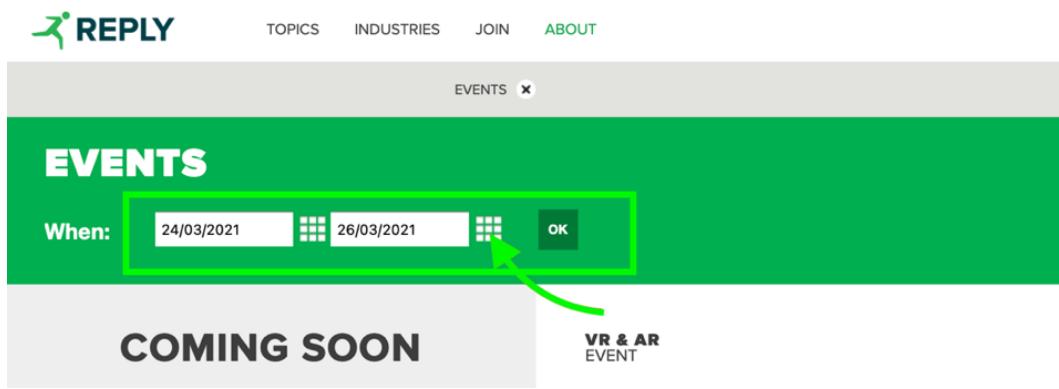
Screenshot 3: <https://www.reply.com/en/investors/news/>



Screenshot 4: <https://www.reply.com/en/filenotfound>

Heuristic Type	Heuristic	Overall Score
Nielsen	User control and freedom	5

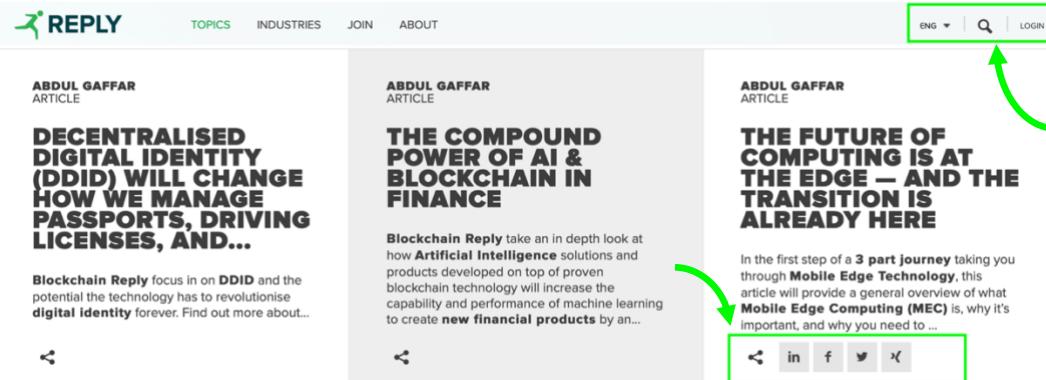
The heuristic is satisfied. Indeed, it is always possible to modify a previous choice without having to start over. For instance, when filtering the events by date, the user can edit the selected date range at any time, as shown in Screenshot 5. In addition, the user is freely able to navigate the website and leave the current page through the persistent header.



Screenshot 5: <https://www.reply.com/en/newsroom/events/>

Heuristic Type	Heuristic	Overall Score
Nielsen	Consistency and standards	5

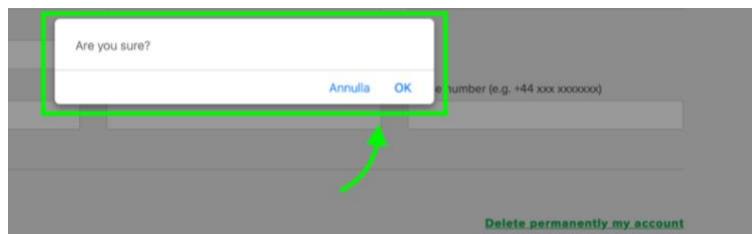
The basic standards are satisfied throughout the website. For example, as shown in Screenshot 6, the position of the login button and that of the search icon is the standard one. Furthermore, the +/- icons in the footer and the arrow in the drop-down menu have the typical meaning. Moreover, the website is consistent in terminology usage.



Screenshot 6: <https://www.reply.com/en/blockchain>

Heuristic Type	Heuristic	Overall Score
Nielsen	Error prevention	3

The system has some weaknesses concerning this heuristic. For instance, as shown in Screenshot 8, when a new user goes through the registration process, he/she has no way of knowing the password security requirements until after submitting the form. On the other hand, the system requests confirmation to carry out some operations that the user may incorrectly select, such as the deletion of the account (Screenshot 7).

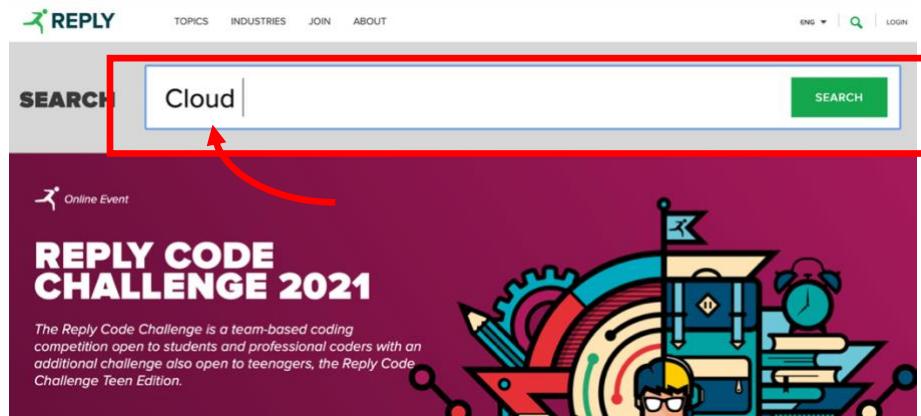


Screenshot 7: <https://www.reply.com/en/userprofile>

Screenshot 8: <https://www.reply.com/en/register>

Heuristic Type	Heuristic	Overall Score
Nielsen	Recognition rather than recall	2

As highlighted in Screenshot 9, the system does not provide any suggestion when a user tries to search for something. Also, during the registration process, some fields could be implemented as a dropdown list instead of plain text input (e.g., Role field). Despite this, in the Webinar section, a very effective live filtering search box has been implemented (every time the user types a letter, the system checks and shows only the matching results).

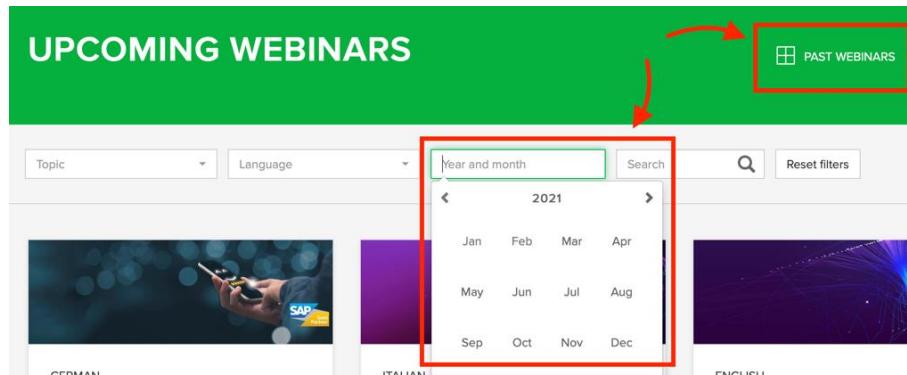


Screenshot 9: <https://www.reply.com/en>

Heuristic Type	Heuristic	Overall Score
Nielsen	Flexibility and efficiency of use	3

The navigation through the “Topics” menu in the header is chaotic and inefficient, the topics are all listed without further categorization or grouping. In addition, there are also some problems with flexibility. For example, as shown in Screenshot 10, when looking for a webinar the search form does not allow you to select past dates. To view previous webinars, you need to visit a different section, which is counterintuitive.

On the other hand, some accelerators are well implemented on the website. For example, as highlighted in Screenshot 11, the system allows the insertion of dates both through the textboxes (novice user) and through the calendar icon (accelerator for expert user).

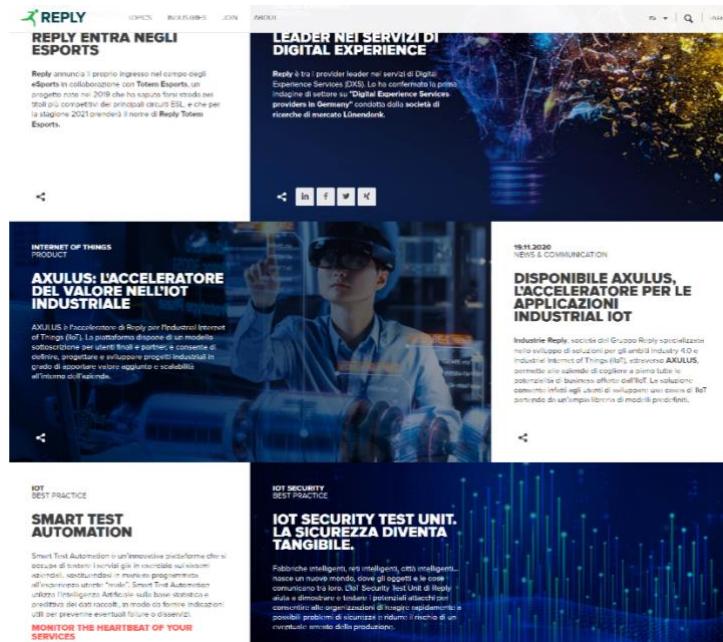


Screenshot 10: <https://webinars.reply.com>

Screenshot 11: <https://www.reply.com/en/newsroom/news/>

Heuristic Type	Heuristic	Overall Score
Nielsen	Aesthetic and minimalist design	2

The website is aesthetically good. Despite this, the style adopted does not match the minimalist one. For instance, the homepage acts as a showcase with too many articles with very long descriptions. Moreover, as shown in Screenshot 12, the pages of the website are often crowded with images and other graphic elements. Everything is too compacted, leading to an information explosion.

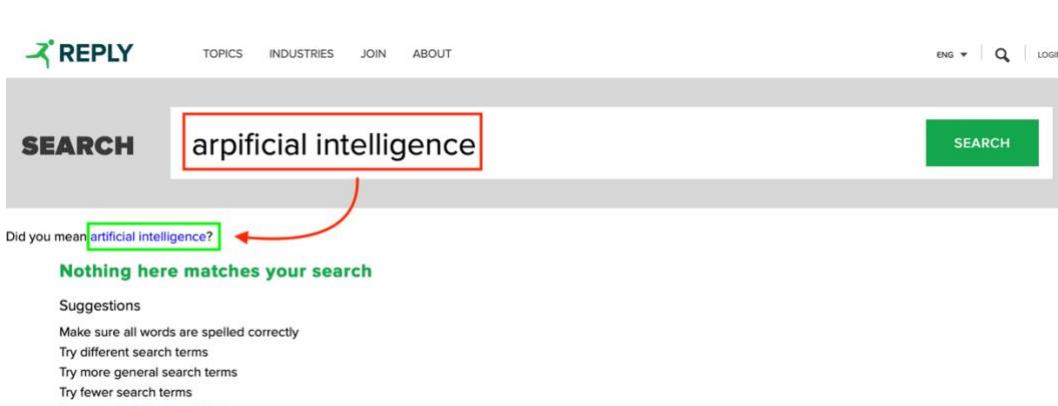
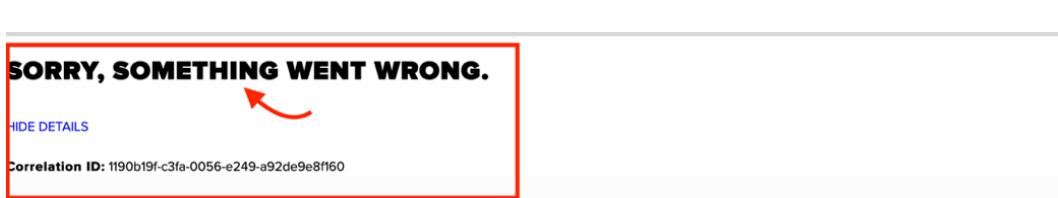
Screenshot 12: <https://www.reply.com/en/topics/internet-of-things/>

Heuristic Type	Heuristic	Overall Score
Nielsen	Help users recognize, diagnose and recover from errors	1

This heuristic is not satisfied in several cases. During the login process, if a user writes the wrong email or password, the system notifies him/her with a generic error message (Screenshot 13). Moreover, some errors, such as the Page Not Found one, are accompanied by a short explanation message, while others simply show a code and give no indication of what went wrong (Screenshot 14, Screenshot 15).

Despite that, it is possible to recover from some erroneous situations. For instance, as shown in Screenshot 16, if a user uses the search box and commits a typo, the system is able to detect it, even if it does not show directly the correct answers.

The screenshot shows a 'LOGIN TO REPLY' form. A red box highlights the error message 'Invalid Username or Password'. A red arrow points to this message. Below the form, a caption reads 'Screenshot 13: <https://www.reply.com/en>'.



Heuristic Type	Heuristic	Overall Score
Nielsen	Help and documentation	N/A

This heuristic does not apply to the system under consideration.

Heuristic Type	Heuristic	Overall Score
MILE Navigation	Interaction consistency	4

The heuristic is almost satisfied. However, some similar pages have not the same interaction capabilities. For example, as highlighted in Screenshot 17, some case study articles open as a pop-up, while others open as a new tab.



Screenshot 17: <https://www.reply.com/it/topics/artificial-intelligence-and-machine-learning>

Heuristic Type	Heuristic	Overall Score
MILE Navigation	Group navigation	0

The navigation flow is not smooth. As shown in Screenshot 18, the system does not provide any useful button to move between articles on the same topic. Indeed, the breadcrumb, when displayed, only allows user to return to the home page and not to reach intermediate pages.



Screenshot 18: <https://www.reply.com/it/topics/artificial-intelligence-and-machine-learning/>

Heuristic Type	Heuristic	Overall Score
MILE Navigation	Structural navigation	3

It is easy to navigate among all the parts of a topic since everything is displayed on a single page. However, this approach leads to a bit of confusion: too many elements make it difficult to find what you are really looking for. This problem is clearly visible from Screenshot 19.

The screenshot shows a grid of nine rectangular components, each representing a different financial or operational area. The components are arranged in three rows and three columns. The first row contains: 'FINANCIAL NEWS' (with a sidebar for 'Company events 2021 Calendar'), 'REPLY SHARE INFORMATION' (with a sidebar for 'MTA, STAR...'), and 'INCOME STATEMENTS & BALANCE SHEETS' (with a sidebar for 'FINANCIAL HIGHLIGHTS'). The second row contains: 'FINANCIAL CALENDAR' (with a sidebar for 'Financial calendar and events'), 'ANNUAL & QUARTERLY REPORTS' (with a sidebar for 'Financial...'), and 'ORDINARY MEETING' (with a sidebar for 'Shareholders' meeting'). The third row contains: 'LOYALTY SHARES' (with a sidebar for 'Loyalty shares'), 'CORPORATE GOVERNANCE' (with a sidebar for 'Board of Directors, Other corporate bodies, Annual reports, Articles of association'), and 'RELEVANT DOCUMENTS' (with a sidebar for 'Extraordinary transactions'). Each component has a 'VIEW MORE' button at the bottom right.

**TOO MANY COMPONENTS**

Screenshot 19: <https://www.reply.com/en/investors/>

Heuristic Type	Heuristic	Overall Score
MILE Navigation	Semantic navigation	4

This heuristic is satisfied where applicable. Some articles come with a sidebar that shows related topics so that the user can easily access them (Screenshot 20). However, this useful function is not available for all the articles.

The screenshot shows a news article titled 'TIMMUSIC IS AVAILABLE EVERYWHERE, AT ANY TIME, ON ANY DEVICE'. The article is categorized under 'CASE STUDY' and 'ARTIFICIAL INTELLIGENCE & MACHINE LEARNING, VOCAL RECOGNITION'. A sidebar on the right is highlighted with a green border and labeled 'RELATED CONTENTS'. It lists a related article: 'EVERYTHING-AS-AN-INTERFACE" IS THE NEW PARADIGM RESULTING FROM...' with a date of '22.02.2021' and a brief description. At the bottom of the sidebar, there is a 'REPLY MARKET RESEARCH HUB' section.

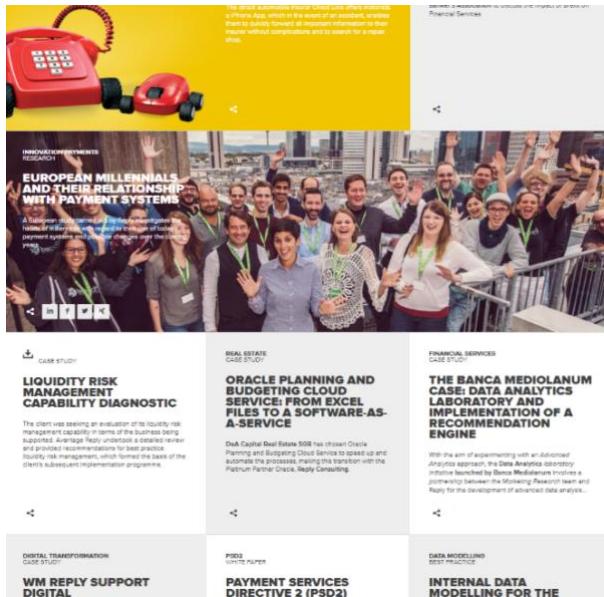
Screenshot 20: <https://www.reply.com/it/topics/artificial-intelligence-and-machine-learning/>

Heuristic Type	Heuristic	Overall Score
MILE Navigation	Landmarks	5

This heuristic is fully satisfied. Indeed, the landmarks are always available in the header of the website and they provide useful access points to the main functions and sections.

Heuristic Type	Heuristic	Overall Score
MILE Content	Information overload	1

Every page of the website is really crowded with information, which leads to an overload as can be seen in Screenshot 21. For instance, the home page contains dozens of articles with long descriptions, details on upcoming events and upcoming webinars, and also information on the latest press releases.



Screenshot 21: <https://www.reply.com/en/industries/financial-services/>

Heuristic Type	Heuristic	Overall Score
MILE Presentation	Text layout	5

Despite that in many cases the website uses an image as a background, the text is always clearly readable, and the font size is appropriate (Screenshot 22).



Screenshot 22: <https://www.reply.com/en/topics/supply-chain-management/>

Heuristic Type	Heuristic	Overall Score
MILE Presentation	Interaction placeholders-semiotics	5

The heuristic is fully satisfied. Indeed, the main used icons are the standardized ones and reflect the meaning of the interaction and its effects. For instance, the share icon and the search button result in actions that are what the user expects.

Heuristic Type	Heuristic	Overall Score
MILE Presentation	Interaction placeholders-consistency	5

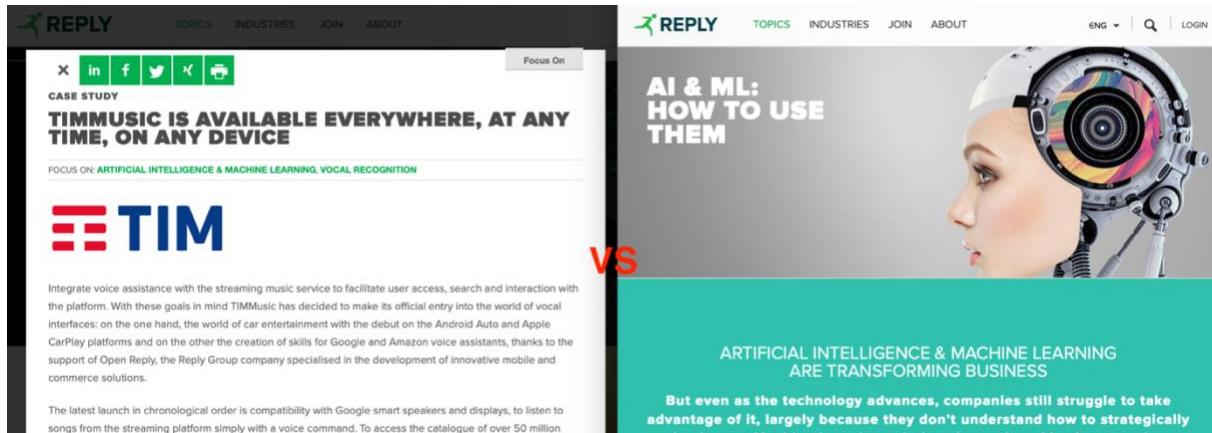
The placeholders are commonly shared across all the pages. Also, their position is always the same, in order to be easily reachable and recognisable for the users.

Heuristic Type	Heuristic	Overall Score
MILE Presentation	Spatial allocation	5

Pages have a simple but efficient layout, consisting of a header for navigation and search, a body with related articles and a footer with “contact us” information.

Heuristic Type	Heuristic	Overall Score
MILE Presentation	Consistency of Page Structure	3

Almost all the main pages of the website share the same basic structure. However, many articles often have totally different structures: some are shown as pop-ups, others as stand-alone pages despite dealing with the same type of information. The different structure (Screenshot 23) causes a sense of disorientation in the user.



Screenshot 23: <https://www.reply.com/it/topics/artificial-intelligence-and-machine-learning/>

## 1.2.2 Inspection Results

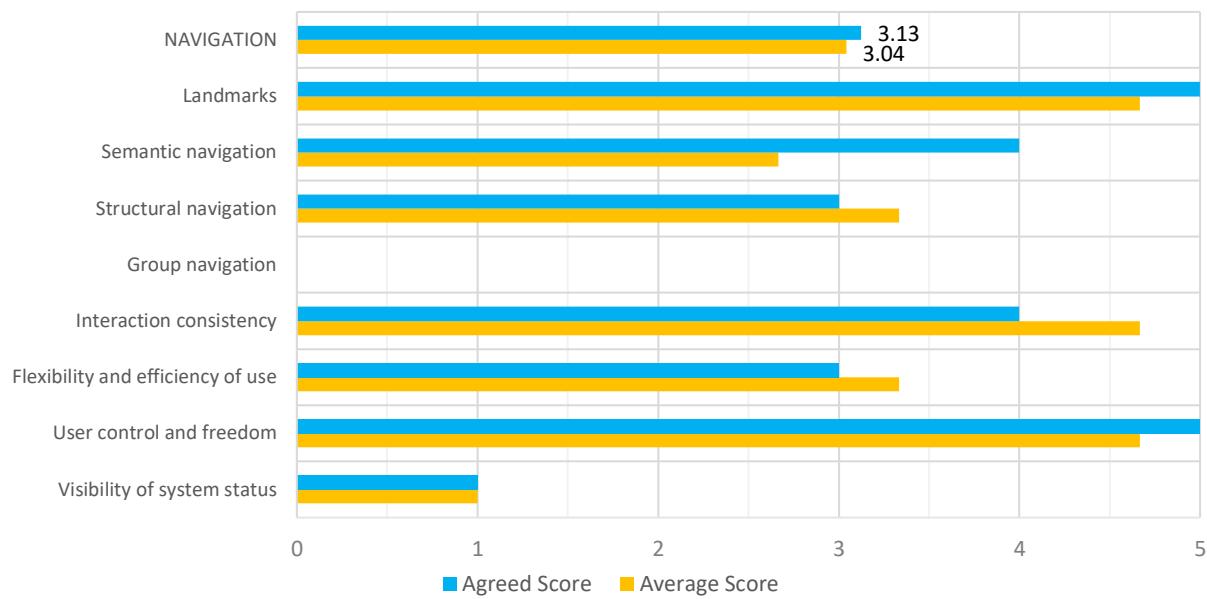
As previously explained in the Inspection Execution, the website has been evaluated according to Nielsen and MILE heuristics. In this section a brief summary of the weaknesses and strengths highlighted is given.

### ▪ Navigation Heuristics

The Navigation dimension has been rated positively. Indeed, it provides good control to the user and was overall sufficiently flexible and consistent. The main problem encountered concerns the lack of an effective status bar and of a proper navigation structure among groups of components.

Heuristic Type	Heuristic	Agreed Score	Average Score
Nielsen	Visibility of system status	1	1
Nielsen	User control and freedom	5	4,67

Nielsen	Flexibility and efficiency of use	3	3,33
MILE	Interaction consistency	4	4,67
MILE	Group navigation	0	0
MILE	Structural navigation	3	3,33
MILE	Semantic navigation	4	2,67
MILE	Landmarks	5	4,67
<b>Navigation average</b>		3,13	3,04

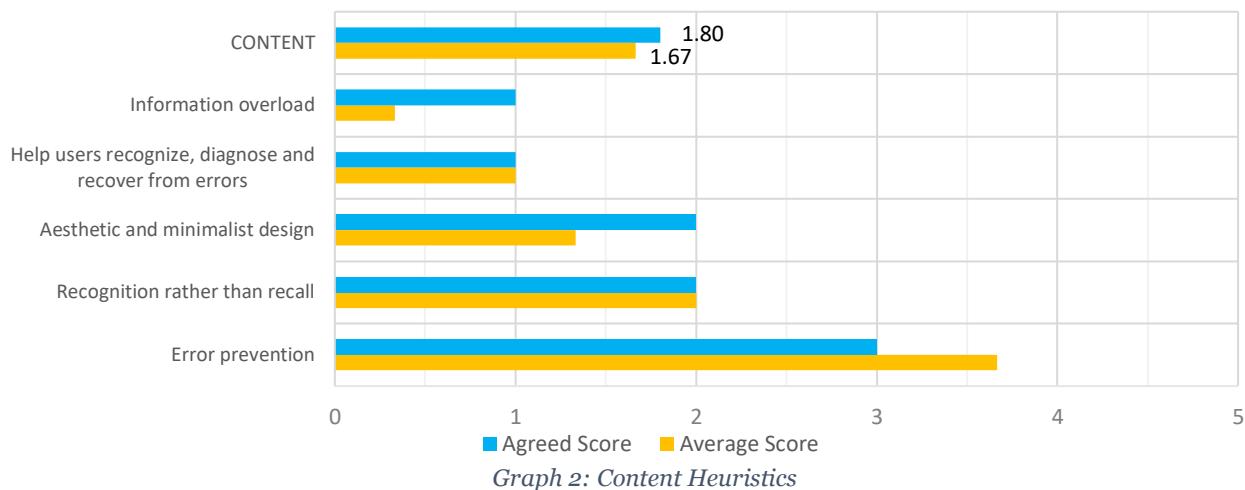


Graph 1: Navigation Heuristics

## ▪ Content Heuristics

The evaluation of the Content heuristics has pointed out criticisms relating to the load of information shown to the user during the navigation. Moreover, the system is unable to offer assistance in critical circumstances.

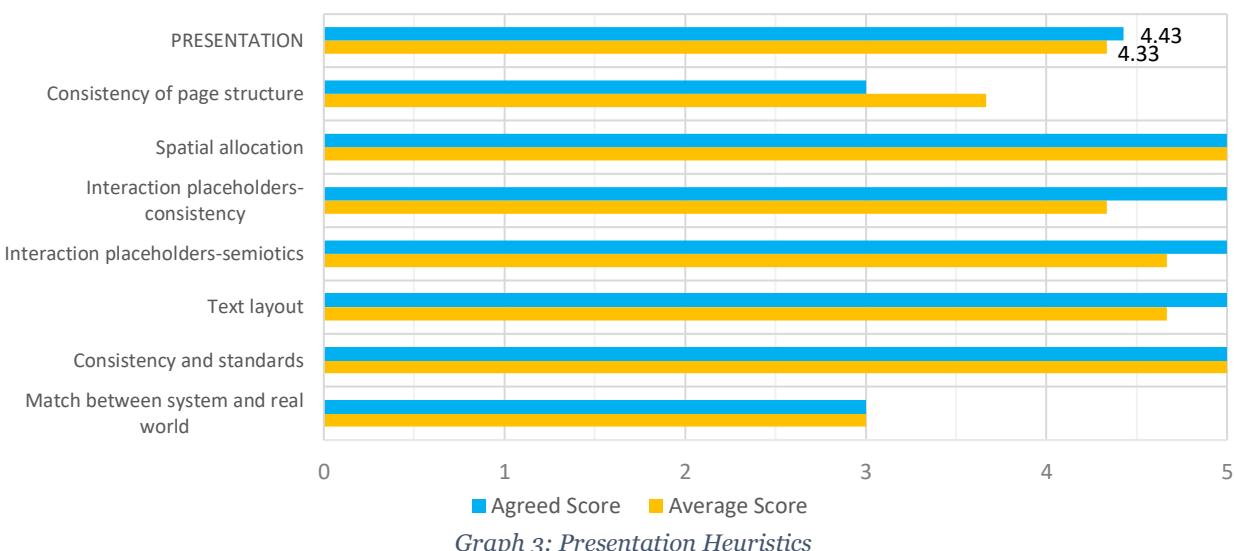
Heuristic Type	Heuristic	Agreed Score	Average Score
Nielsen	Error prevention	3	3,67
Nielsen	Recognition rather than recall	2	2
Nielsen	Aesthetic and minimalist design	2	1,33
Nielsen	Help users recognize, diagnose and recover from errors	1	1
MILE	Information overload	1	0,33
<b>Content average</b>		1,80	1,67



## ■ Presentation Heuristics

When examining the website, no significant issues related to the Presentation dimension arise. The text is always clearly readable, the spatial allocation is correct, and the whole website is coherent to standards. On the other hand, the different structure, adopted by some pages when dealing with the same type of information, represents an imperfection.

Heuristic Type	Heuristic	Agreed Score	Average Score
Nielsen	Match between system and real world	3	3
Nielsen	Consistency and standards	5	5
MILE	Text layout	5	4,67
MILE	Interaction placeholders-semiotics	5	4,67
MILE	Interaction placeholders-consistency	5	4,33
MILE	Spatial allocation	5	5
MILE	Consistency of page structure	3	3,67
<b>Presentation average</b>		4,43	4,33



# 2 User Testing

User testing consists of the data collection and observation of how some representatives of real users interact with the system. User behaviours are observed, recorded and then analysed.

Its goal is to discover the actual difficulties encountered by users when interacting with the website and to obtain systematic feedback on its effectiveness and use.

## 2.1 User Testing Design

Due to the Covid-19 pandemic, the test has been designed according to some constraints. It will be held completely remotely, sharing the screen and recording the session. Test users are also encouraged to embrace the *Think Aloud* technique in order to overcome the problem of not being able to accurately analyse their behaviour. *Think Aloud* is a method invented by psychologist Édouard Claparède, which consists of externalising by voice what the user thinks and plans during task execution.

### 2.1.1 User Profile Definition

The definition of a standard user profile to test the web application allows to make the results comparable and to have reliable feedback based on multiple experiences. Here, we focus on its characteristics and on the definition of an effective recruiting technique.

#### 2.1.1.1 User Profile

Unfortunately, due to the Covid-19 pandemic and to the difficulty to physically reach people who have a proper workstation, it would have been impossible to set the user profile as the typical person who might be interested in the website. Therefore, the decision fell on *university students or recent graduates* between 22 and 27 years old who are *passionate about technology* and who have the minimum necessary computer skills.

Indeed, the targeted users will actually need this type of website in the near future or are familiar with this kind of application. Possible goals for them are, for example, applying for a job or keeping themselves updated on the efforts of Reply in the technological field.

#### 2.1.1.2 Recruitment strategy

The test users will be mainly selected among recent graduates or university students of the following disciplines: computer science, telecommunications and electronics. In this way, the adherence to the profile described above and the homogeneity of the sample will be guaranteed.

During the selection, it will also be essential to analyse the technological equipment available to them. Indeed, the test users must have a computer, a microphone, a webcam, an internet connection and the possibility to share the screen with their interviewers.

## 2.1.2 Usability Variables Definition

Some variables have been chosen to be measured during the execution of the tasks and by a subsequent survey for the testers. The usability variables include both quantitative and qualitative indicators and are reported in the following table.

Usability Variable	Description
V1 <i>Effectiveness</i>	Task success rate
V2 <i>Efficiency</i>	Time needed to complete the task
V3 <i>Errors</i>	Wrong paths or actions while completing the task

<i>V4</i>	<i>Satisfaction</i>	Users' feelings about the navigation experience
<i>V5</i>	<i>Disorientation</i>	Difficulty in understanding how to move between the shown contents
<i>V6</i>	<i>Wandering periods</i>	Difficulty to realize the next steps
<i>V7</i>	<i>Confidence with the design</i>	Difficulty in understanding what is the next step to take

*Table 1: Usability Variables*

### 2.1.3 Tasks Definition

Six tasks have been created for the users to evaluate the usability of the Reply website. To minimise the learning effect on them during the computation of effectiveness and efficiency, they have been randomised.

Since the website acts as a showcase for the company, the tasks have a medium-low difficulty and have been defined according to the user profile previously described. Indeed, these activities reflect the real possible scenarios of use for the system under consideration.

The tasks selected are detailed in the following table.

<b>Task</b>		<b>Description</b>
<b>T1</b>	<i>Register to a Webinar</i>	You are very passionate about the world of artificial intelligence. Look for information on the latest webinar related to artificial intelligence that took place in the past. What you read will make you want to know even more, so you will decide to register for the next webinar related to this topic which will be held in Italian.
<b>T2</b>	<i>Locate the Milan Office</i>	You are interested in finding out more information about the Reply offices in Milan. In particular, you want to know the address and telephone number of the office closest to the centre of Milan.
<b>T3</b>	<i>Retrieve information about a game</i>	You are a master student with a passion for gaming and virtual reality. You have heard of a game called Theseus developed by Reply and would like to know more information about the game and the platforms for which it is available for the thesis you are writing on VR.
<b>T4</b>	<i>Job search</i>	You are an American student who graduated at the University of Illinois at Chicago in Computer Science and Engineering. You are looking for a seat in Reply. Search for a job opportunity and discover which benefits it offers.
<b>T5</b>	<i>Event discovery</i>	Your little sister is interested in computer science. Find if Reply offers some opportunities for children. You also want to stay updated about the upcoming opportunities through social networks.
<b>T6</b>	<i>Financial Report</i>	For the optional project of Accounting and Financing, you are asked to analyse in-depth several companies. One of them is Reply. Find information about the share of the company. Furthermore, find the contact information of the INTESA SANPAOLO analyst.

*Table 2: Tasks Definitions*

## 2.1.4 Pilot Test

Before submitting the test to the recruited users, it has been simulated among the group members and through a candidate user. This candidate user did not take part in the test in order not to generate bias. In this way, it has been possible to minimise misunderstandings and prevent any errors in the formulation of the test from impacting the results of the study.

## 2.1.5 Post Test Questionnaire

After the session, the recruited users are asked to complete a brief questionnaire, here reported.

<b>Part 1</b>	
<b>Assessment</b>	<b>How much do you agree with the following statements?</b> <i>(1=totally disagree, 5=totally agree)</i>
<i>Content</i>	The used terminology was understandable throughout the website
	The naming and labelling of the links were
	Under each section of the website, the web pages were well organised
	There was too much information on individual pages
<i>Navigation</i>	The navigation bar was helpful
	It was necessary to scroll often to reach the desired information
	It was easy to find the information I needed on the website
	The "Search Function" was helpful and reliable
<i>Cognitive Effort</i>	I learned to use the website quickly
	The navigation was always intuitive
	While using the website I often felt disoriented
<i>Presentation</i>	The text shown on the website was always clearly readable
	Pages were structured and displayed in an effective way
<b>Part 2</b>	
<b>Comments</b>	<b>If you could change one thing on this website, what would it be and why? (open question)</b>
<b>Part 3</b>	
<b>Overall rate</b>	<b>How would you rate your experience on the website?</b> <i>(1=poor, 5=very good)</i>

User Test Post Questionnaire

## 2.2 User Testing Execution

As previously described, the goal of the study is to observe the actual usage of the website in order to evaluate its usability. In the following chapters, the test and its execution are explained in a more detailed way, with a section dedicated to the data gathered, their meaning, interpretation and results.

### 2.2.1 Execution

Eight users have been recruited for the test, according to the User Profile previously defined. Before its execution, the purpose of the test and its structure were clearly explained. In particular, users know that they are free to leave the test at any time and that the examination concerns the website and not their performance.

Since the session would be online, the users are asked to share their screen, open the microphone and the webcam. All the sessions have been recorded to analyse them also in a second moment. A file (reported in section B.1) containing all the relevant information concerning the test session has been provided to the tester.

The order of the tasks has been randomised for each user in order to minimise the learning effect. Every session starts from the homepage of the website. During the execution, the moderator kept track of the time required to accomplish each task, took notes and was available for any further question by the user. At the end of the Task Phase, users were asked to fulfil a brief survey about the experience.

### 2.2.2 Data Analysis

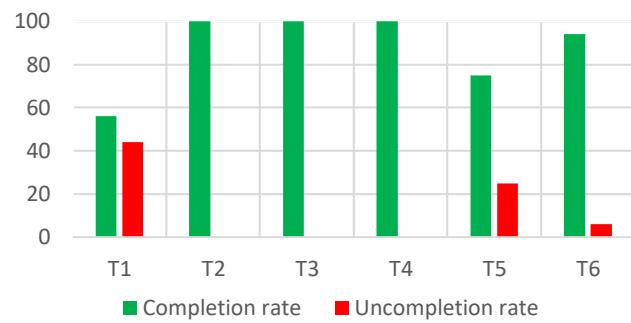
The data collected during the execution of the test are reported in full form and analysed in this section.

#### ▪ Effectiveness

The effectiveness of the website is analysed by detecting the degree of completion of the assigned tasks. This rate is defined as the percentage of operations carried out correctly and in a totally autonomous manner. The gathered data are reported in Table 1. Specifically, the task is considered successful (S) if completed without assistance, partial (P) if only partially completed and failed (F) if the intervention of the moderator was required to complete it. The overall success rate of the system is approximately equal to 87,5%.

User	T1	T2	T3	T4	T5	T6
1	S	S	S	S	S	S
2	F	S	S	S	S	S
3	P	S	S	S	S	S
4	P	S	S	S	S	S
5	S	S	S	S	F	S
6	P	S	S	S	F	P
7	S	S	S	S	S	S
8	F	S	S	S	S	S
	56%	100%	100%	100%	75%	94%

Table 1: Success Rate per task



Graph 1: Effectiveness Graph

As shown in Graph 1, the task with the highest incompleteness rate is *T1 (Register to a Webinar)*. This fact highlights critical issues in the intuitiveness of the webinar section. During the test, many users were unable to complete this task due to the inability to reach the webinar page or difficulty in understanding its content.

The completion rate is also particularly low for *T5 (Event Discovery)*. Again, this is due to the difficulty of users in locating the link that leads to the section presenting opportunities for kids.

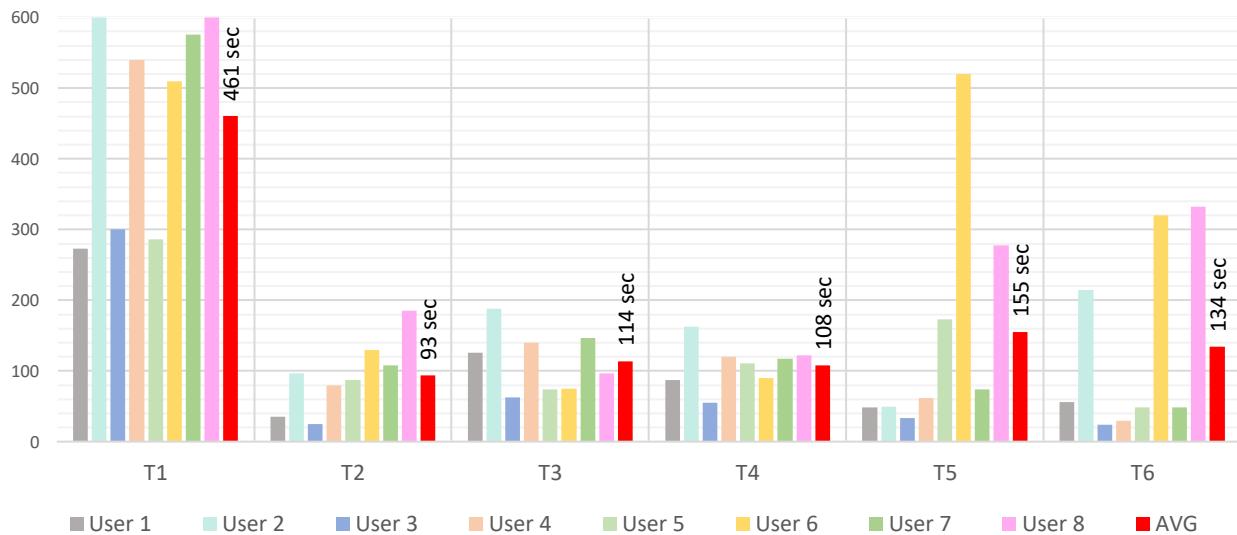
On the other hand, all the testers managed to pass the *T<sub>2</sub>* (*Locate the Milan Office*), *T<sub>3</sub>*(*Retrieve information about a game*), and *T<sub>4</sub>*(*Job search*) tasks which means that the application has no serious shortcomings that prevent them from being completed.

#### ▪ Efficiency

System efficiency is measured by the amount of time it takes to complete tasks. This time is defined as the time that elapses between the opening of the homepage and the instant in which the user declares to have completed the activity. The measured times are shown in Table 2.

User	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
<b>1</b>	273	35	126	87	48	56
<b>2</b>	600	97	188	163	49	214
<b>3</b>	300	25	63	55	33	24
<b>4</b>	540	80	140	120	62	30
<b>5</b>	286	87	74	111	173	48
<b>6</b>	510	130	75	90	520	320
<b>7</b>	576	108	147	117	74	48
<b>8</b>	600	185	97	122	278	332
<b>AVG</b>	461	93	114	108	155	134

Table 2: Time on task in seconds



Graph 2: Efficiency Graph

The average execution time of the tasks, also shown in Graph 2, appears to be quite reasonable given their complexity. However, from the data, it can be seen that the most time-consuming activity is *T<sub>1</sub>* (*Register to a Webinar*). This indicates that there are problems with the website to access the webinar sections efficiently. Indeed, users complained about the lack of a link to the webinars directly on the topics' pages. Some testers also pointed out the need for the Webinar entry right in the navigation bar.

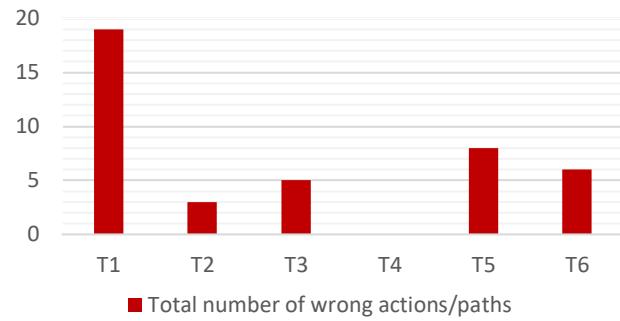
The experiment also found that users spend most of the time examining the large amount of information that is shown to them. This could indicate that it is necessary to reduce the information load on the pages and in the navigation menu.

#### ▪ Errors and confidence with the design

The error variable measures the number of wrong actions or paths taken by the user while browsing. The values recorded by the moderator during the execution of the task are reported in Table 3.

User	T1	T2	T3	T4	T5	T6
1	2	0	0	0	0	0
2	3	0	4	0	0	3
3	3	0	0	0	0	0
4	4	0	0	0	0	0
5	2	0	0	0	4	0
6	2	1	0	0	3	3
7	2	1	0	0	0	0
8	1	1	1	0	1	0
	19	3	5	0	8	6

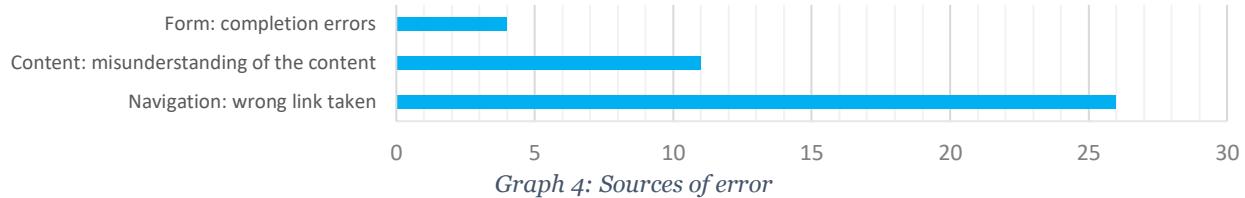
Table 3: Error Count



Graph 3: Errors Graph

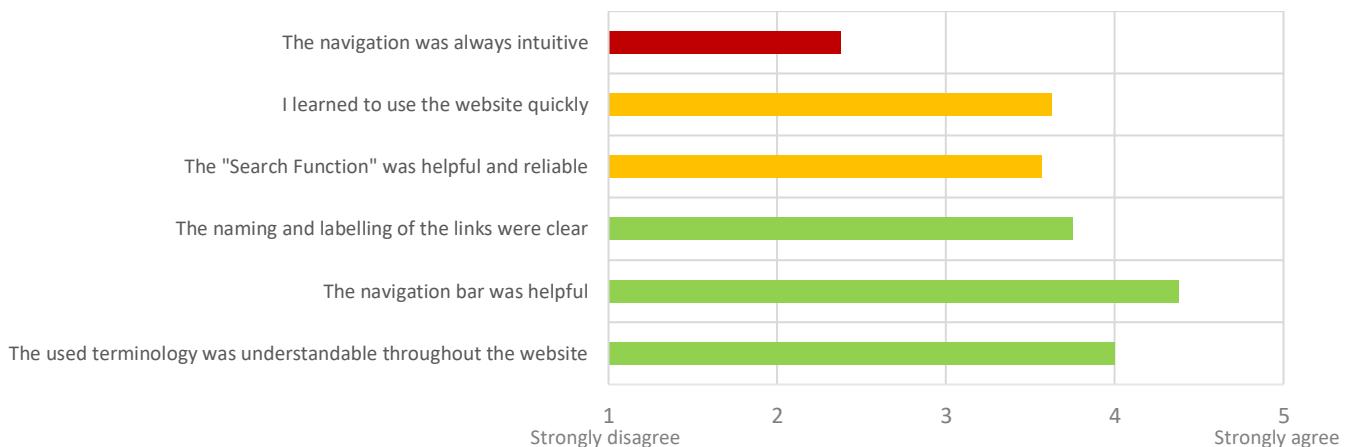
As Graph 3 shows, task T1 is the one with the highest number of wrong actions/path. This proves that the system has areas where navigation is not very intuitive, or the user is misled by unclear labels. Graph 4 lists the major sources of errors for users. In particular, it highlights problems in navigation: users often look for information on pages where they are not present because they do not understand the general organizational structure of the website content.

Another recurring error is related to the completion of the webinar registration form. In this case, the user is led to incorrectly complete the password field as there is no indication of the requirements that it must comply with until after submitting the form.



These issues are also confirmed by some answers given in the post-test questionnaire (Graph 5). In general, users rely on the search function integrated into the website, but not always they are able to find what they were looking for. Some of them argue that the results should also include data relating to the events or to the various opportunities offered by Reply and not be limited to articles only. The interface showing the results is also not very user friendly according to some comments.

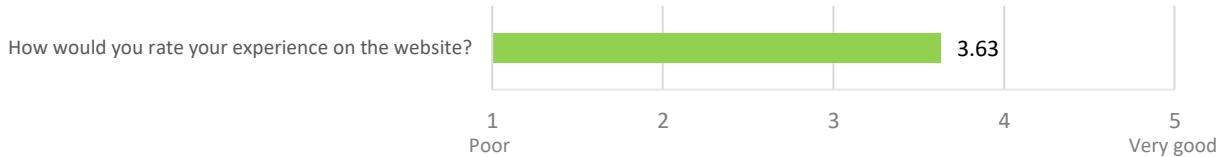
During the experiment, often the user was not sure which keywords to type in the search box or how to write them (e.g., they were worried about typos in writing the word "Theseus") and the system did not provide any autocomplete aid.



Graph 5: Part of the post-test questionnaire

- Satisfaction, disorientation and wandering periods**

During the test, the moderators carefully analysed the expressions and reactions of the users. These data, together with the results of the post-test questionnaire, are essential to assess the degree of satisfaction. Users generally rate the experience with the website more than positively, as reported in Graph 6.

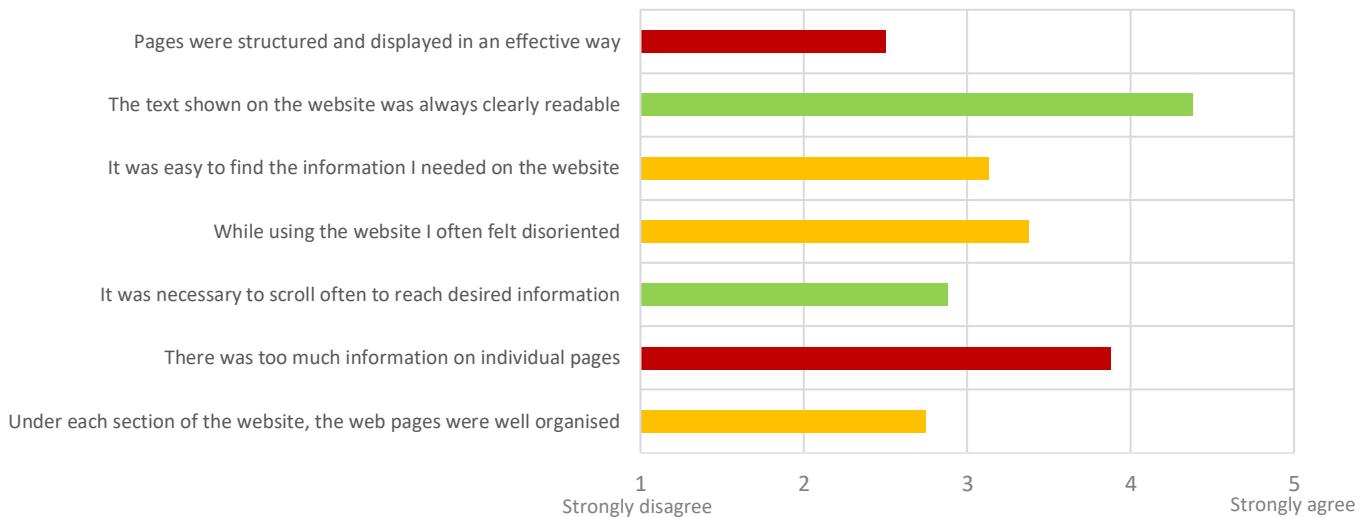


Graph 6: Satisfaction assessment from the post-test questionnaire

The perceived feeling was mainly one of satisfaction. The periods of greatest stress and fatigue occurred, again, during the execution of task T1. This is mainly due to the fact that users have often felt disoriented in searching for specific information. As noted above, the vast majority of time was spent browsing the various pages of the website as users had a hard time finding the webinar sections and specific events.

As shown in graph 7, the general opinion is that the pages of the website often contain too much information (information overload) and that the spatial allocation of the components needs improvement. A large chunk of users started scrolling through the pages to the end showing visible disorientation.

On the other hand, testers were generally satisfied when searching for specific articles (*T5 - Event Discovery*) or when locating the company's offices. This shows that the global search function actually helps the user and information about Reply is provided effectively.



Graph 7: Part of the post-test questionnaire

Table 4 also reports the general comments collected during the test and mentioned above.

<b>If you could change one thing on this website, what would it be and why?</b>	
<b>User 1</b>	Often too much information is shown. Furthermore, the colours used on the website and the images shown were too many and gave a sense of confusion.
<b>User 2</b>	The home page contains too much information making it difficult to find what you really need.

<b>User 3</b>	The way the articles and various elements are displayed on the website pages is too confusing.
<b>User 4</b>	I would add a section in the navigation bar for searching the events and the opportunities offered by Reply.
<b>User 5</b>	I would add a link to the webinar section also in the various Topic sections.
<b>User 6</b>	I would improve the search tab with a more user-friendly interface. Furthermore, I would have preferred that in the pages about the Reply offices the "View on map" button would show the position directly on the embedded map and not in a new tab.
<b>User 7</b>	I would have preferred a more linear website. There is too much information on the screen and navigation suffers from this.
<b>User 8</b>	It was not clear if the registration procedure has been successfully completed. Thus, I would add a message which notifies the user about the completion of the request.

*Table 4: Post-test comments of the users*

# 3 Final Conclusions

This chapter contains the conclusions of the usability report relating to the Reply website. The considerations made in the following sections represent the basis on which the system can be improved to provide a better user experience for end-users.

## 3.1 Comments and Suggestions

After having completed the Inspection and having analysed the data collected during the User Testing, it is feasible to expose a global evaluation of the website. Both experts and recruited users agree that Reply.com is high-grade in terms of usability and design. However, it presents some weaknesses that have been already highlighted during the Inspection. Also, users felt disoriented and frustrated while performing some tasks.

These vulnerabilities are mainly related to navigation. Indeed, the website does not have a proper breadcrumb that allows users to know exactly where they are. Moreover, the Topics pages are not organised adequately. For instance, they do not contain all the related features, such as the webinars. Indeed, they are accessible only through the homepage. On the other hand, the system does not implement any error-prevention mechanism. Furthermore, it does not provide any suggestion when using the Search function.

Also, the experience found out that users spend most of the time examining the large amount of information shown to them. It could indicate that it is necessary to reduce the information load on the pages and the navigation menu.

Of course, Reply.com has various strengths. All the testers express appreciations regarding the design and the layout of the website, and no one experienced deadlocks.

In the table below are listed some improvements needed to fill the gaps identified during the evaluation process. Despite most of the suggestions are quick to implement, they might significantly improve the experience for new users.

Category	Problem	Severity	Suggested improvement
Navigation	Users felt disoriented when browsing the website. Some testers confused the breadcrumb with a filter for the content, due to its appearance.	High	Implementation of a proper breadcrumb.
	Almost all of the testers, when performing task T1 (Register to a Webinar), browsed the Topic page looking for the related webinars. It turns out that these pages do not contain any link to the Webinar section.	Medium	Addition of the related upcoming webinars directly in the Topic page.
	To move from one article to another or from one topic to another, the user must start over.	Low	Implementation of previous/next buttons to ease the navigation.

<i>Content</i>	Several pages contain too much information that makes the user feel disoriented.	High	Reduce the information load on the topic's pages and in the homepage.
			Split the header into further subcategories.
	As highlighted both in the Inspection and the User Testing, the system is not able to prevent errors. For instance, most of the users failed the first attempt of choosing a password during registration, because the security requirements are revealed only after submitting the form.	Medium	Implementation of an error-prevention mechanism when filling in the registration form.
<i>Presentation</i>	The system does not provide any suggestion when a user tries to search for something.	Low	It could be helpful to provide hints when typing keywords in the search box.
			Some fields in the registration form could be implemented as dropdown list instead of a plain text input (e.g., Role field).
	Sometimes, how articles related to the same topic are shown is different. For instance, some case study articles open as a pop-up, while others open as a new tab.	Medium	Harmonize the structure of article pages.

# A Inspection Annex

This chapter contains the complete individual reports of the inspections on the usability of the Reply website.

## A.1 Individual Inspection 1

<b>Inspector:</b> Luca Leoni				
<b>Heuristic Type</b>	<b>Heuristic</b>	<b>Score</b>	<b>Comment</b>	<b>Reference</b>
Nielsen	Visibility of system status	1	Despite the website retains the information about the status, the breadcrumb is badly implemented. The user is not aware of the presence of it. Indeed, it is not clearly shown as a status bar. A kind of Location-Based Breadcrumb is implemented, but not in an intuitive way.	Screenshot 1. 1



Screenshot 1. 1 <https://www.reply.com/en/industries/logistics-and-manufacturing/>

<b>Heuristic Type</b>	<b>Heuristic</b>	<b>Score</b>	<b>Comment</b>	<b>Reference</b>
Nielsen	Match between system and the real world	4	The only problem is related to the partial translation of the principal labels. In fact, the main labels are only in English, so, they could not appear natural and logical to the users.	Screenshot 1. 2



Screenshot 1. 2 <https://www.reply.com>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	User control and freedom	4	<p>In the majority of the cases, you can at most perform 3 steps. From the Homepage to a specific showcase (you can go back through the x button) and from there to a specific page. In this case, we have to differentiate the case in which a new panel is opened and the case in which appears a window.</p> <p>PANEL: you can go back simply by closing the panel.</p> <p>WINDOW: an x button will show and through that you can return to the previous page.</p>	-
Nielsen	Consistency and standards	5	The essential standards are respected, such as the login button, search box, exit button and share icons.	Screenshot 1. 3

The screenshot shows the Reply website's homepage with a navigation bar at the top featuring 'REPLY' logo, 'TOPICS', 'INDUSTRIES', 'JOIN', 'ABOUT', 'ENG', a search icon, and a 'LOGIN' button. Below the navigation, there are three article cards. Each card has a title, author (Abdul Gaffar), and a brief description. The first article is about decentralized digital identity. The second is about the compound power of AI and blockchain in finance. The third is about the future of computing at the edge. Each article card includes social sharing icons (Twitter, LinkedIn, Facebook, etc.) at the bottom.

Screenshot 1. 3 <https://www.reply.com/en/blockchain>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Error prevention	3	The system presents some weaknesses. For instance, when a new user performs the Registration process, only after confirming the request, the system checks whether the rules concerning password or email are followed.	Screenshot 1. 4

**CREATE A NEW ACCOUNT**  
Already registered? Please login [here](#)

Before filling out the registration form, please read the [Privacy notice](#) pursuant to Article 13 of EU Regulation 2016/679

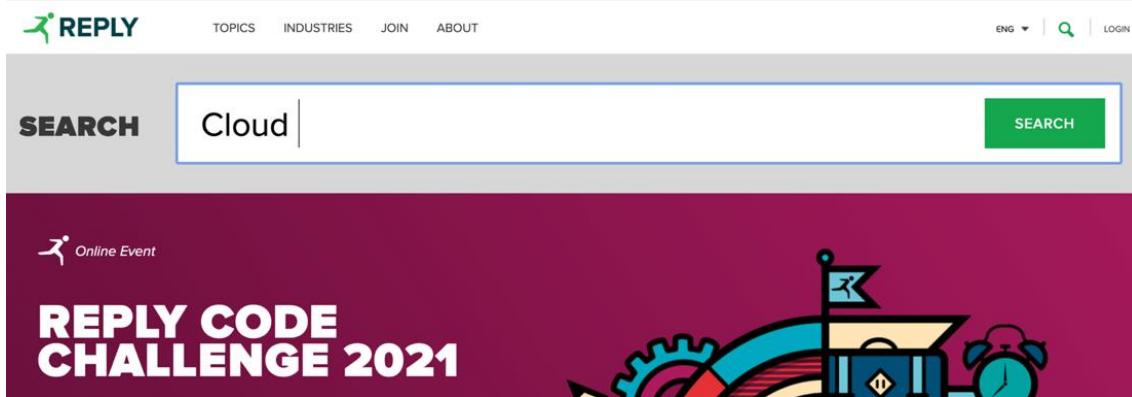
Your password length must be at least 8 characters and contain at least 1 number and 1 letter.

Name\*  
Luca

Surname\*  
Leoni

Screenshot 1. 4 <https://www.reply.com/en/register>

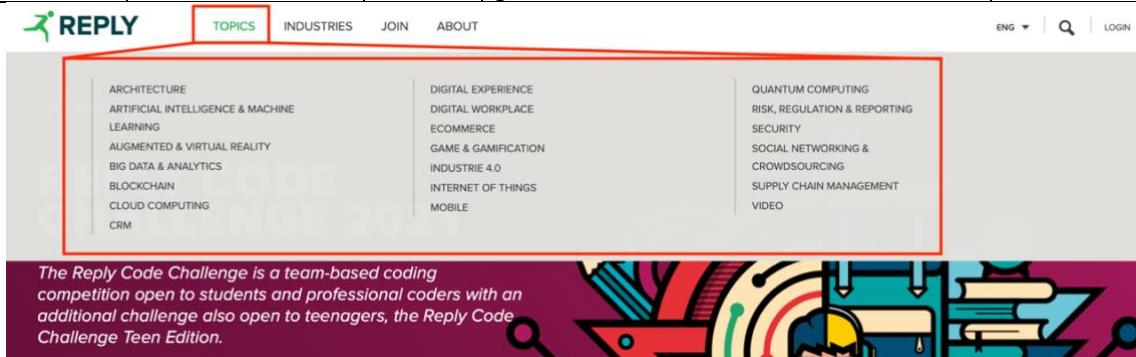
Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Recognition rather than recall	2	The system does not provide any suggestions when a user tries to search for something. Despite that, in the Webinar section, it has been implemented a live filtering search box (every time the user types a letter, the system checks and shows only the matching results).	Screenshot 1. 5



Screenshot 1. 5 <https://www.reply.com>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Flexibility and efficiency of use	4	The navigation through the header is not helpful. Indeed, there are too many categories, and the users could feel disoriented.	-
Nielsen	Aesthetic and minimalist design	0	The whole website is crowded with information. There are too many subcategories in each section. The Homepage acts as a showcase with all the articles of the website.	Screenshot 1. 6

			Despite that, the aesthetic is pleasant.	
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Screenshot 1. 6 <https://www.reply.com>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Help users recognize, diagnose and recover from errors	1	The heuristic is not satisfied in several cases. If a user searches through the search box and commits a typo the system is able to detect it, but it does not show the correct answers. Also, in the Webinar section happens the same. Furthermore, during the login process, if a user writes the wrong email or password, the system notifies the user with a generic error message.	Screenshot 1. 7 Screenshot 1. 8

The screenshot shows the Reply login page. The title is "LOGIN TO REPLY". Below it, a message says "Need an account? [Register now!](#)". A red error message "Invalid Username or Password" is displayed above the login form. The form has fields for "Email" containing "mr.inspector@mail.com" and "Password". Below the form is a link "[I forgot my password](#)". At the bottom is a large green "LOGIN" button.

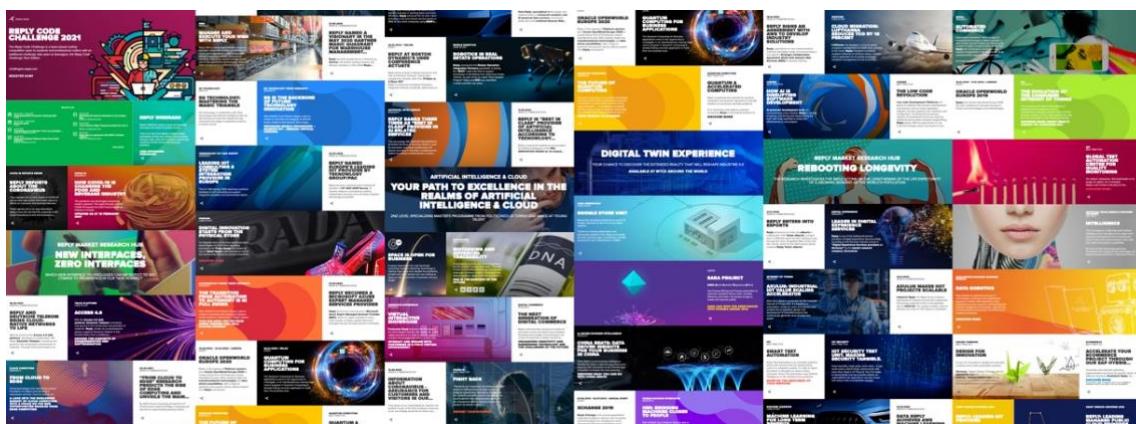
Screenshot 1. 7 <https://www.reply.com/en/login>Screenshot 1. 8 <https://www.reply.com/en/search?k=arpificial%2ointelligence>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Help and documentation	N/A	-	-
MILE Navigation	Interaction consistency	5	The steps to be followed are always the same.	-
MILE Navigation	Group navigation	0	The flow is not stable. Indeed, due to the missing breadcrumb, the user cannot navigate through the different pages without restarting from scratch.	Screenshot 1. 9

The screenshot shows the Reply website's main navigation bar with links for TOPICS, INDUSTRIES, JOIN, and ABOUT. Below the navigation is a search bar with the placeholder "RETAIL & CONSUMER PRODUCTS".

Screenshot 1. 9 <https://www.reply.com/en/industries/retail-and-consumer-products/>

Heuristic Type	Heuristic	Score	Comment	Reference
MILE Navigation	Structural Navigation	3	The website presents too many components. Despite that, it is simple to explore all the parts of a topic since they are all displayed on a single page.	-
MILE Navigation	Semantic Navigation	4	Sometimes N/A. When applicable, the articles are displayed, joined with related posts.	-
MILE Navigation	Landmarks	4	The landmarks are always available. Despite that, they are full of information and sometimes the user does not know in advance exactly where he has to go to find information.	-
MILE Content	Information overload	0	The Homepage is full of information. It contains all the articles posted on the website.	Screenshot 1. 10



Screenshot 1. 10 <https://www.reply.com>

Heuristic Type	Heuristic	Score	Comment	Reference
MILE Presentation	Text layout	5	Despite that in many cases the website uses an image as a background, the text is readable.	Screenshot 1. 11



Screenshot 1. 11 <https://www.reply.com/en/topics/supply-chain-management/>

Heuristic Type	Heuristic	Score	Comment	Reference
MILE Presentation	Interaction placeholders-semiotics	5	The main icons follow the standard design. E.g., Login button, Search function, Share contents	-
MILE Presentation	Interaction placeholders-consistency	5	On each page, the placeholders are available in the same position and with the same aspect.	-
MILE Presentation	Spatial allocation	5	The pages have all the same structure: header, body and footer. Notice that, sometimes the pages are too long, due to information overload.	-
MILE Presentation	Consistency of Page Structure	4	The heuristic is not satisfied in some cases. Indeed, sometimes a new page appears as a pop-up window, while sometimes it is opened in a new panel.	Screenshot 1. 12

CASE STUDY  
NEXIVE ROBOTS USE EDGE COMPUTING TO OBTAIN, COMMUNICATE AND PROCESS DATA IN REAL-TIME

E-commerce continues to grow at a rapid pace and the delivery sector must keep up with it: deliveries that are increasingly quicker, able to reach customers wherever they are and offer greater traceability and reliability. In recent years, players in the sector have had to revise their product and service offerings, adapting to a dynamic and constantly evolving system. Nexeve knows this well: it is a leading Italian player in the shipping sector, with a widely distributed network made up of 12 sorting hubs and about 650 last-mile delivery branches, capable of covering the entire national territory.

A company that originally operated as a postal player, with a national network built around 'postmen/women' and with

E-commerce - innovative and multi-channel solutions | Reply

REPLY TOPICS INDUSTRIES JOIN ABOUT

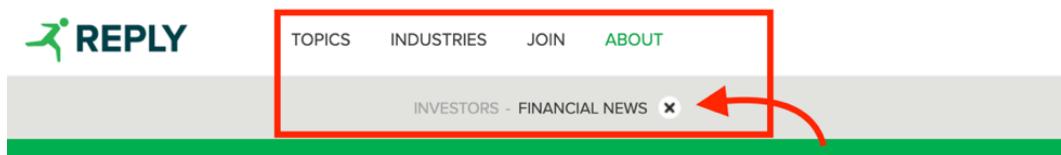
E-COMMERCE

A CLEAR SHOP DESIGN FOR KEIMLING NATURKOST

Screenshot 1. 12: <https://www.reply.com/en/topics/ecommerce/>

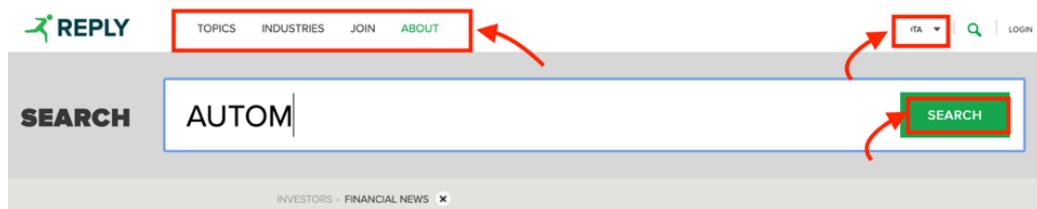
## A.2 Individual Inspection 2

Inspector: Luca Minotti				
Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Visibility of system status	1	Breadcrumbs do not clearly show where the user is in the website hierarchy. Their implementation is extremely counterintuitive.	Screenshot 2. 1

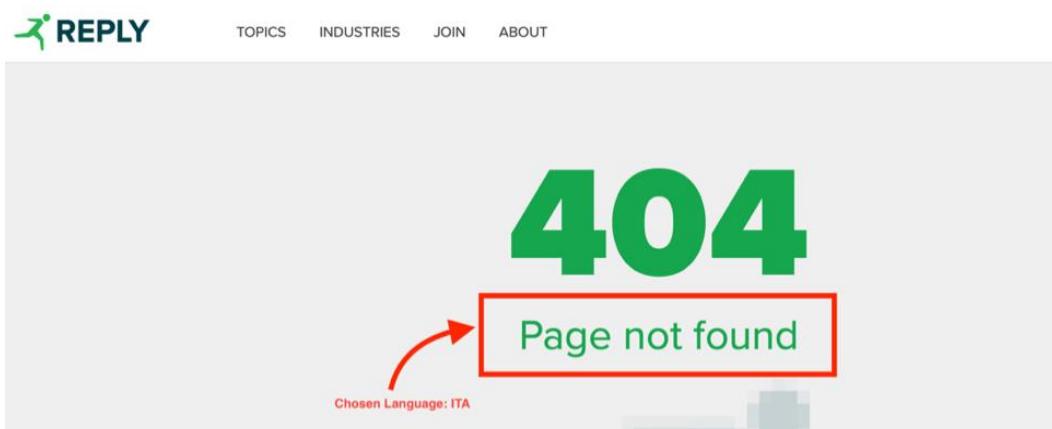


Screenshot 2. 1: <https://www.reply.com/en/investors/news>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Match between system and the real world	3	The system mainly uses words familiar to the user. However, several pages of the website as well as the navigation bar, the search bar and error messages are shown in English regardless of the language chosen by the user.	Screenshot 2. 2 Screenshot 2. 3

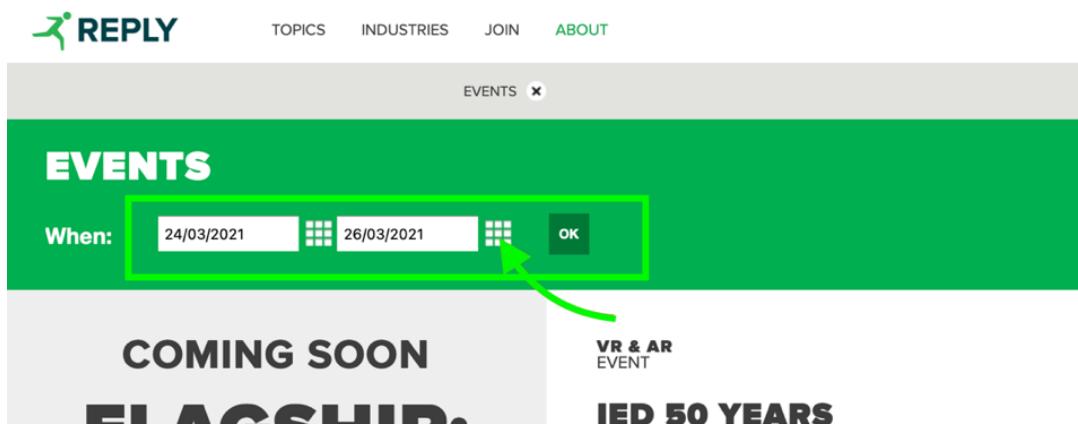


Screenshot 2. 2: <https://www.reply.com/it/investors/notizie>

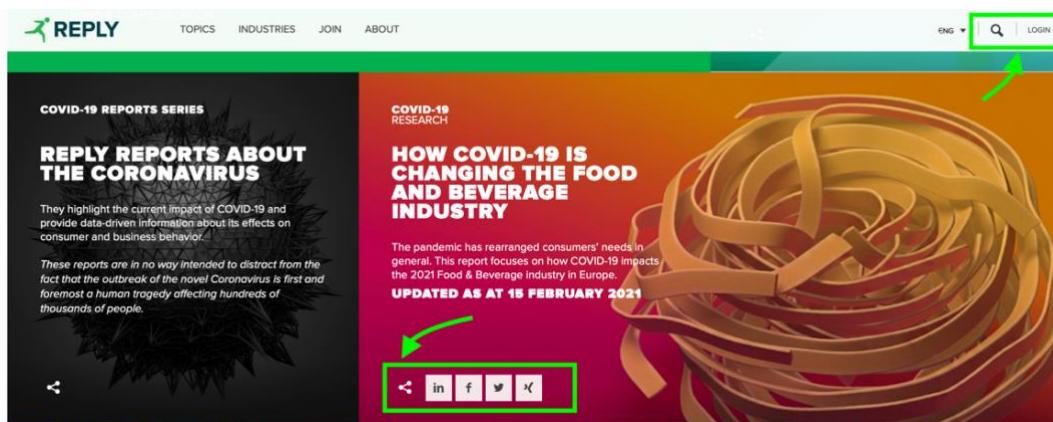


Screenshot 2. 3: <https://www.reply.com/it/filenotfound>

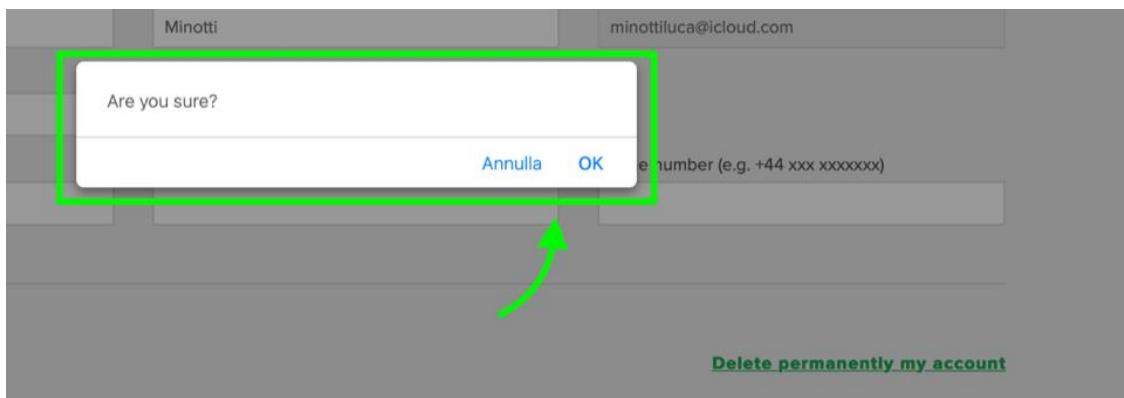
Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	User control and freedom	5	Where applicable, the user can always modify a previous choice without having to start over. For example, when filtering the upcoming events, the user always has the possibility to modify the wrong choice of the date range.	Screenshot 2. 4

Screenshot 2. 4: <https://www.reply.com/en/newsroom/events>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Consistency and standards	5	The website is consistent in the terminologies used and adheres to design standards (e.g., login button at the top right, standard icons for searching, sharing and closing pop-up windows, burger menu for the mobile version)	Screenshot 2. 5

Screenshot 2. 5: <https://www.reply.com>

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Error prevention	3	The system correctly requests confirmation to carry out some operations that the user may incorrectly select, such as deleting the account. However, sections such as the registration one need significant improvements (here the user has no way of knowing the password security requirements before submitting the form).	Screenshot 2. 6 Screenshot 2. 7

Screenshot 2. 6: <https://www.reply.com/en/userprofile>

Your password length must be at least 8 characters and contain at least 1 number and 1 letter.

Name\*

Mario

Surname\*

Rossi

Email\*

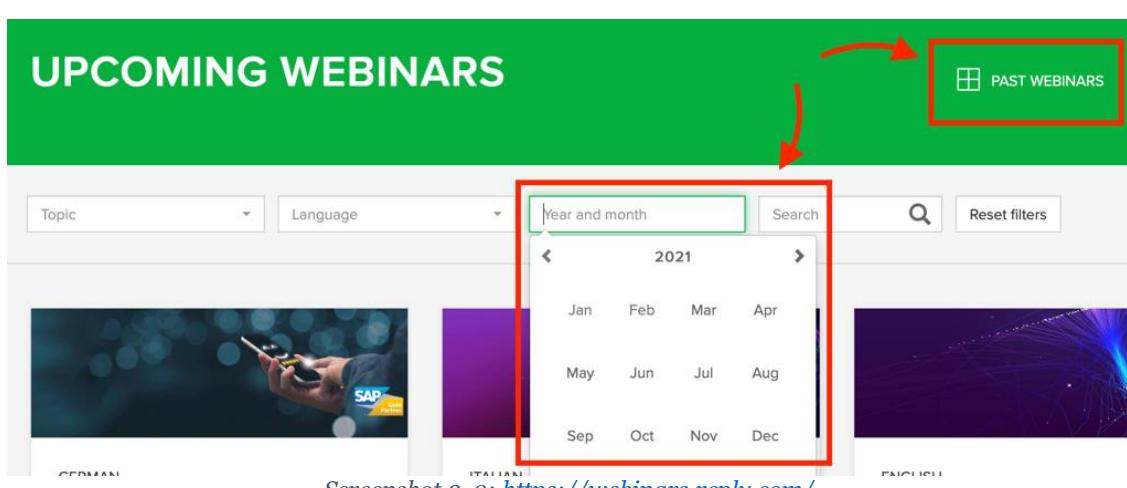
Mario.rossi@polimi.it

Password\*

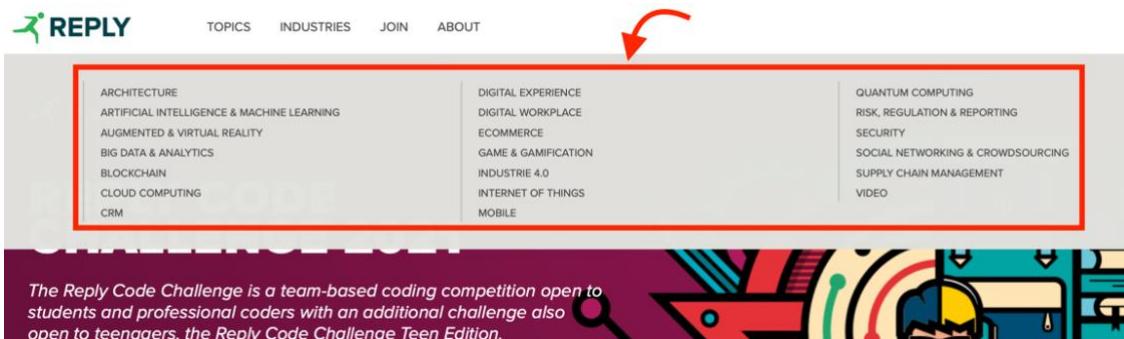
.....

Screenshot 2. 7: <https://www.reply.com/en/register>

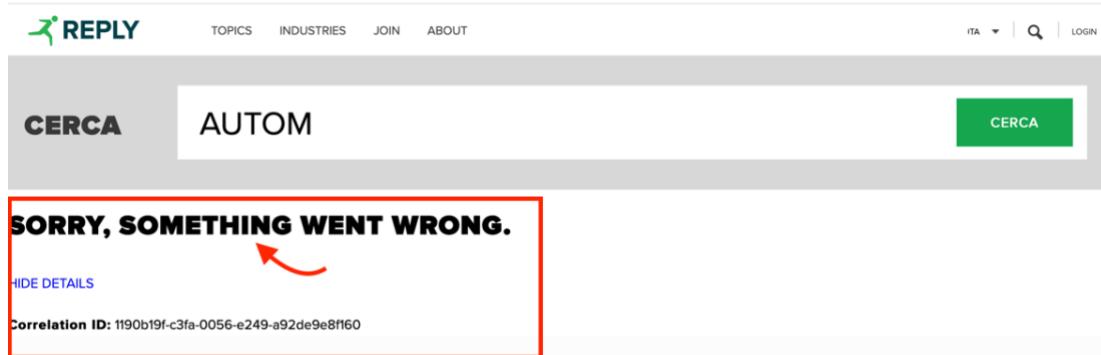
Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Recognition rather than recall	2	The system does not provide any suggestions for filling in some fields during registration or when searching the site using the appropriate function.	-
Nielsen	Flexibility and efficiency of use	4	Heuristics satisfied when applicable. For example, the system allows the insertion of dates both through the textboxes (inexperienced user) and through the calendar icon (accelerator for expert user). However, some flexibility improvements can be made. For example, when searching for a webinar, the search form does not allow you to select dates in the past. To view past webinars, you need to visit another section, which is counterintuitive.	Screenshot 2. 8 Screenshot 2. 9

Screenshot 2.8: <https://www.reply.com/en/newsroom/news>Screenshot 2.9: <https://webinars.reply.com/>

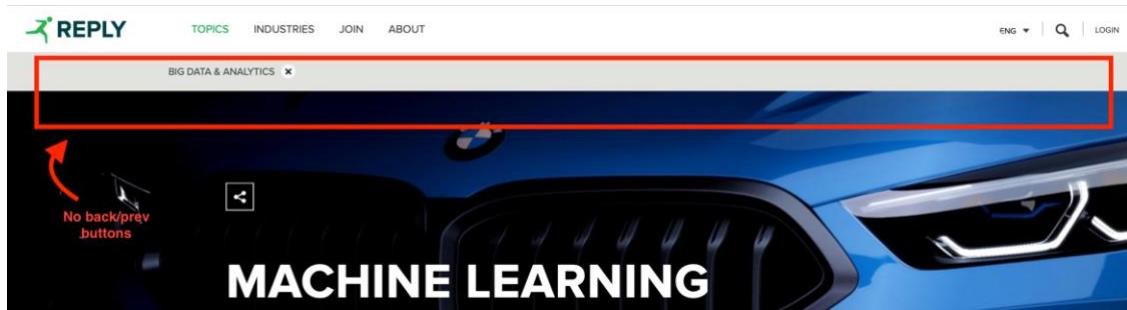
Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Aesthetic and minimalist design	2	The homepage shows too much information making it difficult to find what you are interested in. Even the menu items (e.g., Topics) in the top bar are too many and are not organized into further sub-categories, causing confusion.	Screenshot 2. 10



Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Help users recognize, diagnose and recover from errors	1	Some errors such as the page not found error are accompanied by a short explanation message, while others simply show a code and give no indication of what went wrong.	Screenshot 2. 11



Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Help and documentation	N/A	-	-
MILE Navigation	Interaction consistency	4	Almost satisfied. However, some case study articles open as a pop-up, while others open as a new tab	-
MILE Navigation	Group navigation	0	To move from one article to another or from one topic to another, the user must start over, making navigation difficult. Breadcrumb also do not provide any useful action to go back.	Screenshot 2. 12



Screenshot 2. 12: <https://www.reply.com/en/topics/>

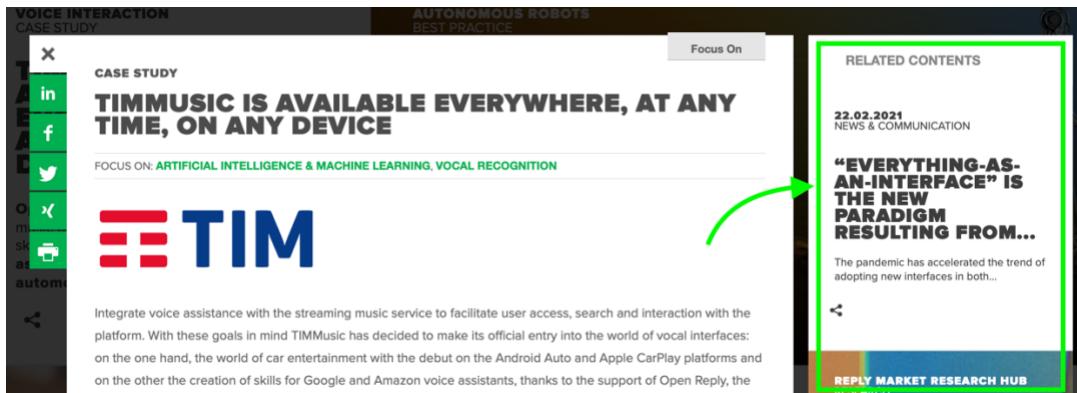
Heuristic Type	Heuristic	Score	Comment	Reference
MILE Navigation	Structural Navigation	3	The problems are concentrated on the homepage of the website and in the Investors section: too many components make it difficult to navigate between them and easily find what you are looking for.	Screenshot 2. 13

A screenshot of the Reply Investors section. The page features a grid of nine cards arranged in three rows and three columns. Each card contains information related to financial news or documents. Red boxes highlight several of these cards across different sections of the page. A large red box labeled 'TOO MANY COMPONENTS' is overlaid on the middle section of the grid. The cards include:

- FINANCIAL NEWS** (with a dropdown menu showing dates like 15.01.2021, 12.11.2020, and 31.07.2020)
- REPLY SHARE INFORMATION** (with a 'Reply [MTA, STAR:...]' link)
- INCOME STATEMENTS & BALANCE SHEETS** (with a 'FINANCIAL HIGHLIGHTS' section and a note about finding main consolidated income)
- FINANCIAL CALENDAR** (with a 'FINANCIAL CALENDAR AND EVENTS' section and a date 15.03.2021)
- ANNUAL & QUARTERLY REPORTS** (with a 'VIEW MORE' button)
- ORDINARY MEETING** (with a date 21.04.2020 and a 'VIEW MORE' button)
- LOYALTY SHARES** (with a 'LOYALTY SHARES' section and a note about finding relevant documents)
- CORPORATE GOVERNANCE** (with a list of items: Board of Directors, Other corporate bodies, Annual reports, Articles of association, and a 'VIEW MORE' button)
- EXTRAORDINARY TRANSACTIONS** (with a 'VIEW MORE' button)

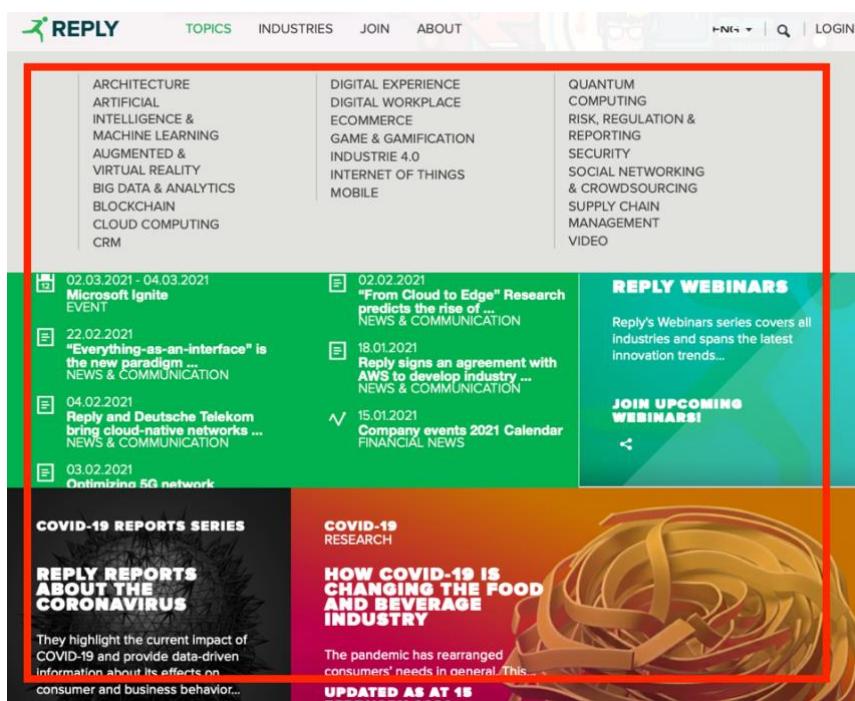
Screenshot 2. 13: <https://www.reply.com/en/investors/>

Heuristic Type	Heuristic	Score	Comment	References
MILE Navigation	Semantic Navigation	4	Some articles are accompanied by a sidebar that shows some related topics. However, this useful function is not available for all the articles.	Screenshot 2. 14



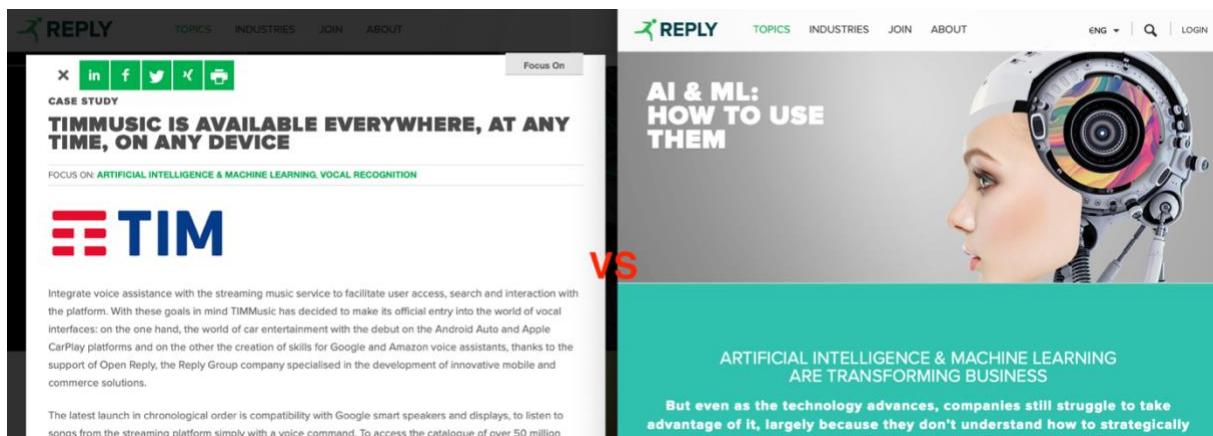
Screenshot 2. 14: <https://www.reply.com/en/content/timmusic-is-available-everywhere-at-any-time-on-any-device>

Heuristic Type	Heuristic	Score	Comment	Reference
MILE Navigation	Landmarks	5	Landmarks correctly provide useful access points to the main components of the website.	-
MILE Content	Information overload	1	The homepage and navigation drop-down menus show too much information making it easy to get lost. The information load is instead balanced in the various subsections (e.g., Topic).	Screenshot 2. 15



Screenshot 2. 15: <https://www.reply.com>

<b>Heuristic Type</b>	<b>Heuristic</b>	<b>Score</b>	<b>Comment</b>	<b>Reference</b>
MILE Presentation	Text layout	5	The text is always clearly readable.	-
MILE Presentation	Interaction placeholders-semiotics	5	No anomaly detected.	-
MILE Presentation	Interaction placeholders-consistency	5	No anomaly detected.	-
MILE Presentation	Spatial allocation	5	No anomaly detected: good spatial allocation.	-
MILE Presentation	Consistency of Page Structure	2	Almost all the main pages of the website share the same basic structure. However, many articles often have totally different structures: some are shown as pop-ups, others as stand-alone pages despite dealing with the same type of information. The different structure (Screenshot 23) causes a sense of disorientation in the user.	Screenshot 2. 16



Screenshot 2. 16: <https://www.reply.com/en/topics/artificial-intelligence-and-machine-learning/>

## A.3 Individual Inspection 3

Inspector: Francesco Ratti				
Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Visibility of system status	1	Breadcrumb is visible on some pages, so the user should be able to know where he/she is. The problem here is that the breadcrumb is not effective: in any section, it shows just the current section name and an X. X meaning isn't so clear. Moreover, when opening an article that takes us outside of the topic page, the breadcrumb disappears. In my opinion, the breadcrumb should be fixed to the top of the viewport, so the user has not to scroll to the top of the page.	<a href="#">Screenshot 3. 1</a> <a href="#">Screenshot 3. 2</a> <a href="#">Screenshot 3. 3</a>  <a href="#">Reply - Offering for Enterprise Architecture &amp; SOA</a>  <a href="#">Reply - Smart Working and the Digital Workplace</a> (almost any page)



TOPICS INDUSTRIES JOIN ABOUT

DIGITAL WORKPLACE



Screenshot 3. 1

LOGIN JOIN ABOUT REPLY

ENG ▾

**WORKSTATION MODERNIZATION**

Screenshot 3. 2

LOGIN JOIN ABOUT REPLY

ENG ▾

EWORKPLACE TRIPLE A PORTFOLIO ▾ INDUSTRIES SERVICE CLIENTS ABOUT US ▾

CASE STUDY  
**HELVETIA VERSICHERUNGEN, AUSTRIA**  
FOCUS ON: CLIENTS

**FASTER ANSWERS FOR CUSTOMERS**

Thanks to Macros Reply the insurance company Helvetia Austria is successfully using Robotic Process Automation – in short RPA – in order to offer customers significantly reduced processing times. The use of RPA allows processes to be automated efficiently and without extensive interface developments. New,

Screenshot 3. 3

Heuristic Type	Heuristic	Score	Comment	Reference
Nielsen	Match between system and the real world	2	Part of the website is in the destination language and part is still in English.	Screenshot 3. 4

The screenshot shows the homepage of the Reply Code Challenge 2021. At the top, there's a navigation bar with the Reply logo, TOPICS, INDUSTRIES, JOIN, and ABOUT. Below the header, there's a dark purple banner with the text "Online Event" and the main title "REPLY CODE CHALLENGE 2021" in large white letters. A subtitle below the title reads: "La Reply Code Challenge è la sfida a squadre organizzata da Reply per avvicinare le nuove generazioni alla cultura del coding e del digitale. Anche quest'anno una challenge addizionale è stata dedicata agli adolescenti, la Reply Code Challenge Teen Edition." At the bottom of the banner, it says "Screenshot 3. 4".

Heuristic Type	Heuristic	Score	Comment	References
Nielsen	User control and freedom	5	The user is freely able to navigate the site and leave the current page through the persistent header on top of the viewport.	Screenshot 3. 5 <a href="#">Big Data Analytics: consulting, Applications, Tools   Reply</a>

The screenshot shows the top header of the Reply website. It features the Reply logo, a search bar, and links for ITA, NEWS & COMMUNICATION, and LOGIN. Below the header, there's a red banner with the text "AUTONOMOUS THINGS TREND RESEARCH" and "27.02.2020". At the bottom of the header, it says "Screenshot 3. 5".

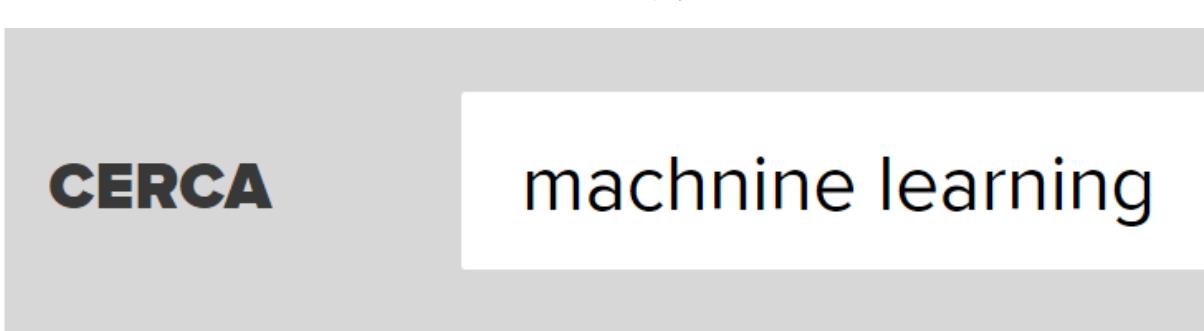
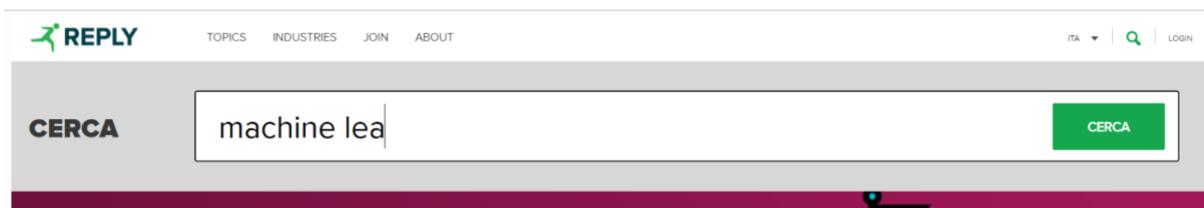
Heuristic Type	Heuristic	Score	Comment	References
Nielsen	Consistency and standards	5	Sharing icon coherent to standard ones (material design) Lens icon to search which is a standard and arrow to indicate a dropdown menu when choosing the language. Plus, minus to show more or less information and social network logos are consistent.	Screenshot 3. 6 Screenshot 3. 7 Screenshot 3. 8



Screenshot 3. 7



Heuristic Type	Heuristic	Score	Comment	References
Nielsen	Error prevention	5	Few simple items which allow navigation: upper bar menu voices and articles titles in the homepage topics: it is unambiguous that clicking on a title will lead the user to read the related article.	Screenshot 3. 5
Nielsen	Recognition rather than recall	2	No suggestion when typing, this is a major drawback in my opinion since a user may don't know precisely what to search on the website (he/she doesn't know what kind of threads there are). If the user commits a typo the system suggests the right search key, which is a great thing.	Screenshot 3. 9 Screenshot 3. 10 <a href="#">Big Data Analytics: consulting, Applications, Tools   Reply</a> <a href="#">Search (reply.com)</a>

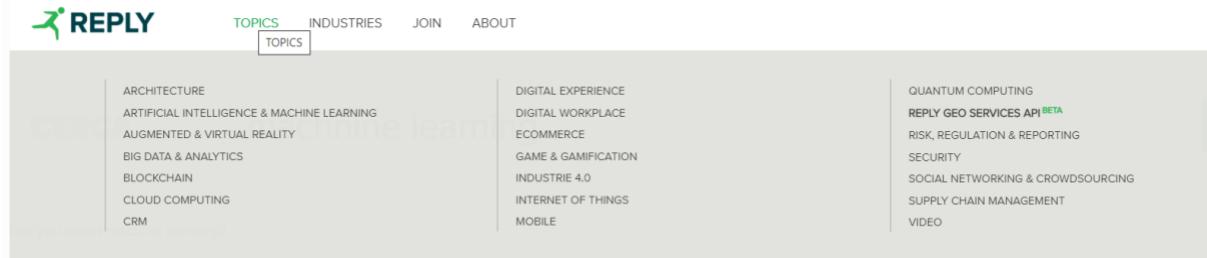


Did you mean [machine learning](#)?

**Nessun risultato per la ricerca**

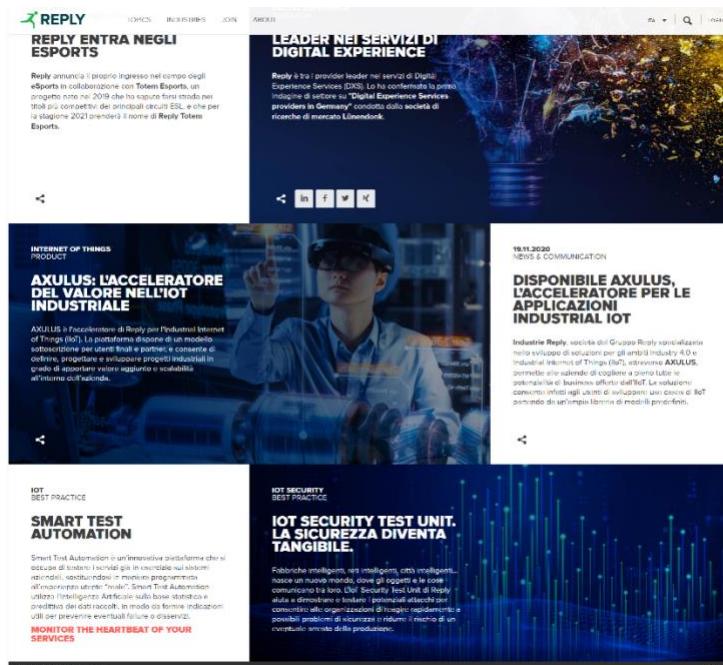
Screenshot 3.10

Heuristic Type	Heuristic	Score	Comment	References
Nielsen	Flexibility and efficiency of use	2	Navigation through topics in the top bar menu is confusing: topics are listed and no categorisation or grouping between them. <i>Screenshot 3.11</i> No accelerators but maybe not needed	Screenshot 3. 11



Screenshot 3. 11

Heuristic Type	Heuristic	Score	Comment	References
Nielsen	Aesthetic and minimalist design	2	Too many items (articles) with long descriptions in a single page. Everything is a bit “compacted” leading to a little information explosion. Otherwise, good design.	Screenshot 3. 12 <a href="#">AI &amp; ML - Reply Offering</a> (any section and homepage)



Screenshot 3. 12

Heuristic Type	Heuristic	Score	Comment	References
Nielsen	Help users recognize, diagnose and recover from errors	1	The login error message is expressed in plain language but does not suggest a solution neither offers a way to go back, an “insulated” page which is completely different from the previous one appears leading to disorientation in the user.	Screenshot 3. 13 <a href="#">Error Page</a> Screenshot 2. 11

## Server Error

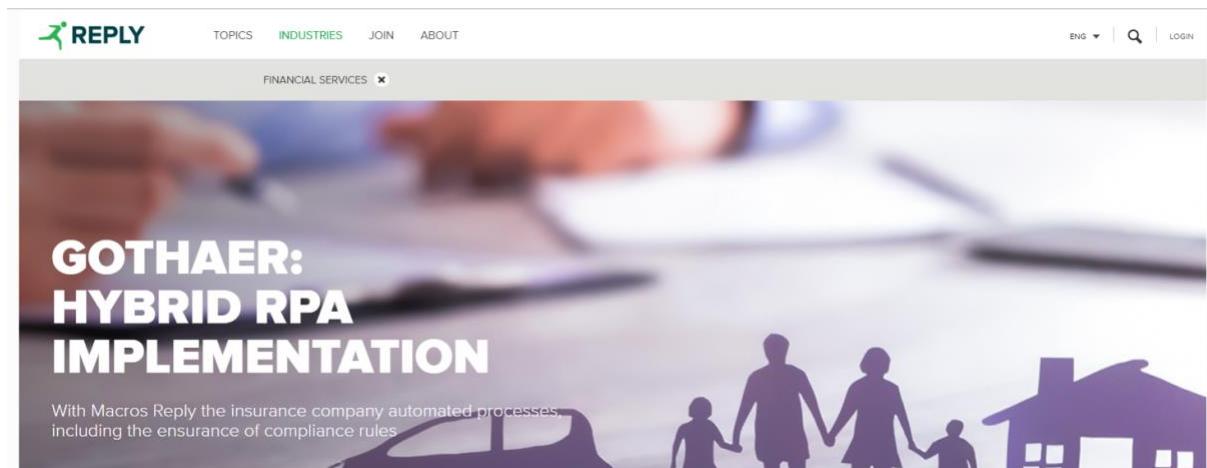
**401 - Unauthorized: Access is denied due to invalid credentials.**  
You do not have permission to view this directory or page using the credentials that you supplied.

Screenshot 3. 13

Heuristic Type	Heuristic	Score	Comment	References
Nielsen	Help and documentation	N/A	-	-
MILE Navigation	Interaction consistency	5	All topic and industries pages are structured according to the same layout and interaction principles. All of them are articles preview container, which allow reading the full article when clicked.	-
MILE Navigation	Group navigation	0	An article is open in a new tab and no “navigation button” to next or previous article of the topic we come from is shown in the breadcrumb. Moreover, there is no way to go back to the previous page to navigate to the next article from the new tab. The breadcrumb offers a way to go to the homepage only.	Screenshot 3. 14 Screenshot 3. 15

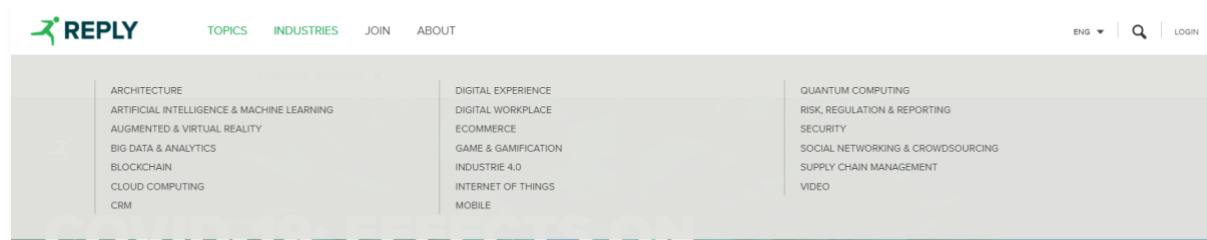
The screenshot shows the Reply website's homepage. At the top, there is a navigation bar with links for TOPICS, INDUSTRIES, JOIN, ABOUT, and LOGIN. Below the navigation, there is a search bar and social media sharing icons for LinkedIn, Facebook, Twitter, and X. The main content area features a large banner for a 'ROBOTIC PROCESS AUTOMATION CASE STUDY' titled 'GOTHAER: HYBRID RPA IMPLEMENTATION'. The banner includes a brief description of the project, mentioning UiPath and Gothaer, and highlights a hybrid approach for employee and bot collaboration. To the left of the banner, there is a section titled 'CLOUD IN FINANCIAL SERVICES' with a short description of the initiative. The overall design is clean and professional.

Screenshot 3. 14



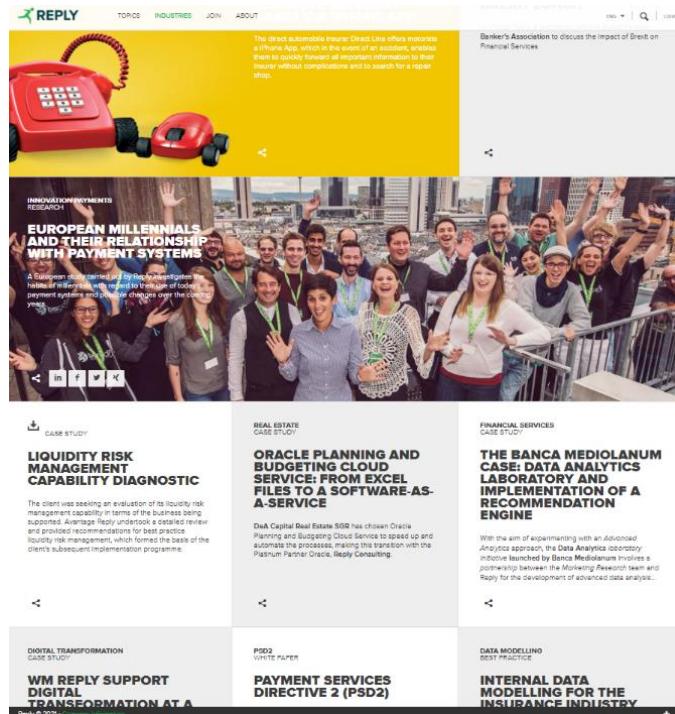
Screenshot 3.15

Heuristic Type	Heuristic	Score	Comment	References
MILE Navigation	Structural Navigation	4	It is easy to navigate among the parts of a topic since everything is displayed on a single page. This leads to a bit of confusion.	-
MILE Navigation	Semantic Navigation	0	An article is open in a new tab and there is no way to navigate to related articles or articles of the same topic. Each article is alone.	-
MILE Navigation	Landmarks	5	All the landmarks are located in the header. Items of the header allow us to navigate to important parts of the website.	Screenshot 3. 16



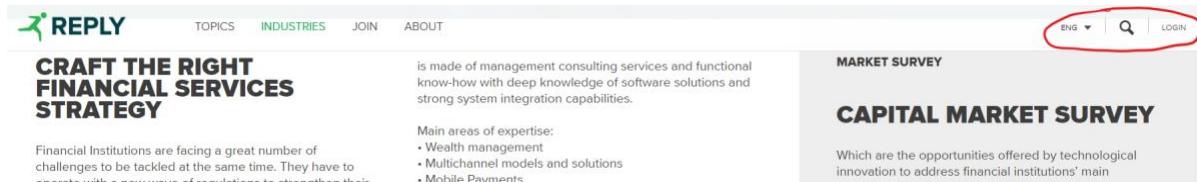
Screenshot 3.16

Heuristic Type	Heuristic	Score	Comment	References
MILE Content	Information overload	0	Every page contains too many articles and text leading to an information overload in my opinion.	Screenshot 3. 17



Screenshot 3. 17

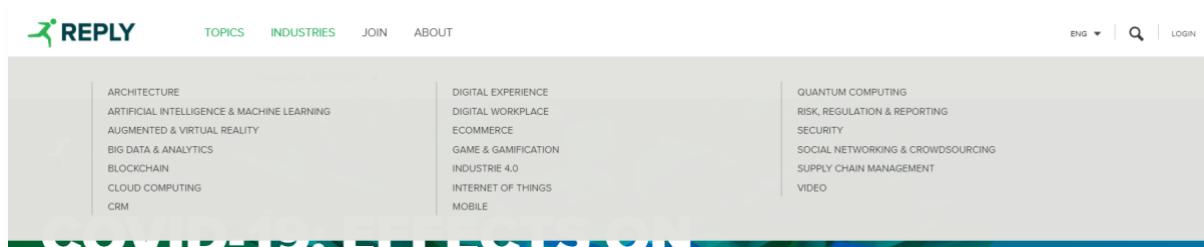
Heuristic Type	Heuristic	Score	Comment	References
MILE Presentation	Text layout	4	Text is readable and the font size is generally right. Only the header top right elements are a bit small.	Screenshot 3. 18



Screenshot 3. 18

Heuristic Type	Heuristic	Score	Comment	References
MILE Presentation	Interaction placeholders-semiotics	4	<p>Sharing icon coherent to standard ones (material design)</p> <p>Lens icon to search which is a standard and arrow to indicate a dropdown menu when choosing the language. <i>Screenshot 3.6</i></p> <p>Plus (<i>screenshot 3.7</i>), minus to show more or less information and social network logos are consistent. <i>Screenshot 3.8</i></p> <p>The only negative part is that the items in the header are simply listed as labels with no semiotic care (no</p>	<p><i>Screenshot 3. 6</i></p> <p><i>Screenshot 3. 7</i></p> <p><i>Screenshot 3. 8</i></p>

			“intuitive” icons to make the most important ones easily recognisable).	
MILE Presentation	Interaction placeholders-consistency	3	<p>All the navigation placeholders are placed in the header, so labels positioning is correct, but the header is not fixed, so the user has to scroll to the top of the page every time.</p> <p>Icons are consistent, as stated in “Interaction placeholders-semiotics” heuristic motivation.</p> <p>All the topic landmarks are placed in the header in a clean label for each of them.</p>	Screenshot 3. 19



Screenshot 3. 19

Heuristic Type	Heuristic	Score	Comment	References
MILE Presentation	Spatial allocation	5	Pages have a simple layout, consisting of a header for navigation, a body with related articles by category and a footer with “contact us” information.	-
MILE Presentation	Consistency of Page Structure	5	All topics and industries pages are structured according to the same layout principles, stated in the latter heuristic	-

# B User Testing Annex

This chapter contains the instructions provided to test users for the User Testing of the Reply website. Also, all the Post Test Questionaries are attached below.

## B.1 Information for Test Users

User Testing

REPLY.COM

17<sup>th</sup> March 2021

## Instructions for the Test User

Test User n° \_\_\_\_\_

First of all, thank you for your time. We kindly ask you to read carefully this document before starting the test session.

### Purpose

The goal of the study is to observe the actual usage of the REPLY.COM website in order to evaluate its usability. Please, remember that the examination concerns the website, you are not going to be evaluated for your performance.

### Structure

The test is structured in two main phases:

**1 Task phase**

In this first phase, you are asked to accomplish the 6 tasks described in the next pages.

**2 Survey phase**

After the first phase, you will answer a few questions about the experience.

### Equipment

Usually, User Testing are performed in specific Usability Lab. Due to the pandemic, we organised the session online.

- You are asked to share your screen, open the microphone and turn on the webcam. We require this in order to obtain a better dataset to analyse.
- We ask you to apply the “Think Aloud” technique, which consists in externalise by voice what you think and plan during task execution. For example, you can explain the steps you will take to reach the final result saying phrases such as “I’m looking for the XYZ command on the page” or “I access the ABC section because I think what I’m looking for is there”.

### REMEMBER THAT

- The website is under examination, not you.
- You are free to quit at ANY TIME.
- A facilitator is here for any question or doubt.

### ANY QUESTIONS BEFORE STARTING?

NB: In order to record the session, we kindly ask you to sign the attached CONSENT FORM.

## Preparation

- Open your microphone
- Turn on the webcam
- Share your screen
- Turn off your mobile phone to avoid any kind of distraction

## Task Phase

- Go to [www.reply.com](http://www.reply.com)
- Complete the following tasks:
- Remember to start each task from the [www.reply.com](http://www.reply.com).

Task	Description
T1	<i>Register to a Webinar</i>  You are very passionate about the world of artificial intelligence. Look for information on the latest webinar related to artificial intelligence that took place in the past. What you read will make you want to know even more, so you will decide to register for the next webinar related to this topic which will be held in Italian.
T2	<i>Locate the Milan Office</i>  You are interested in finding out more information about the Reply offices in Milan. In particular, you want to know the address and telephone number of the office closest to the centre of Milan.
T3	<i>Retrieve information about a game</i>  You are a master student with a passion for gaming and virtual reality. You have heard of a game called Theseus developed by Reply and would like to know more information about the game and the platforms for which it is available for the thesis you are writing on VR.
T4	<i>Job search</i>  You are an American student graduated at University of Illinois at Chicago in Computer Science and Engineering. You are looking for a seat in Reply. Search a job opportunity and discover which benefits it offers.
T5	<i>Event discovery</i>  Your little sister is interested in computer science. Find if Reply offers some opportunities for children. You also want to stay updated about the upcoming opportunities by means of social networks.
T6	<i>Financial Report</i>  For the optional project of Accounting and Financing, you are asked to analyse in depth several companies. One of them is Reply. Find the information about the share of the company. Furthermore, find the contact information of the INTESA SANPAOLO analyst.

## Survey Phase

- Complete the following form:  
<https://forms.office.com/Pages/ResponsePage.aspx?id=K3EXCvNtXUKAjjCd8ope6zjkobhtQIZFhBMP1YXwBMFUNKJENVpGR1dST1RPRTVRSUhDMFZROExMUS4u>

## B.2 Post Test Questionnaire Answers

### B.2.1 Test User 1

1. Enter Name and Surname \*

Lorenzo Giovanni Lacchini

2. The used terminology was understandable throughout the website \*



3. Under each section of the website, the web pages were well organised \*



4. There was too much information on individual pages \*



5. The navigation bar was helpful \*



6. The naming and labelling of the links were clear \*



7. It was necessary to scroll often to reach desired information \*



8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



*User Testing - User 1*

## B.2.2 Test User 2

1. Enter Name and Surname \*

Monica Leone

2. The used terminology was understandable throughout the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5    Strongly agree

3. Under each section of the website, the web pages were well organised \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5    Strongly agree

4. There was too much information on individual pages \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5    Strongly agree

5. The navigation bar was helpful \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5    Strongly agree

6. The naming and labelling of the links were clear \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5    Strongly agree

7. It was necessary to scroll often to reach desired information \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5    Strongly agree

8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



*User Testing - User 2*

## B.2.3 Test User 3

1. Enter Name and Surname \*

Andrea Lampis

2. The used terminology was understandable throughout the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

3. Under each section of the website, the web pages were well organised \*

Strongly disagree    1    2    3    4    5    Strongly agree

4. There was too much information on individual pages \*

Strongly disagree    1    2    3    4    5    Strongly agree

5. The navigation bar was helpful \*

Strongly disagree    1    2    3    4    5    Strongly agree

6. The naming and labelling of the links were clear \*

Strongly disagree    1    2    3    4    5    Strongly agree

7. It was necessary to scroll often to reach desired information \*

Strongly disagree    1    2    3    4    5    Strongly agree

8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



*User Testing - User 3*

## B.2.4 Test User 4

1. Enter Name and Surname \*

Alessia Luoni

2. The used terminology was understandable throughout the website \*



3. Under each section of the website, the web pages were well organised \*



4. There was too much information on individual pages \*



5. The navigation bar was helpful \*



6. The naming and labelling of the links were clear \*



7. It was necessary to scroll often to reach desired information \*



8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



*User Testing - User 4*

## B.2.5 Test User 5

1. Enter Name and Surname \*

Silvia Locarno

2. The used terminology was understandable throughout the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

3. Under each section of the website, the web pages were well organised \*

Strongly disagree    1    2    3    4    5    Strongly agree

4. There was too much information on individual pages \*

Strongly disagree    1    2    3    4    5    Strongly agree

5. The navigation bar was helpful \*

Strongly disagree    1    2    3    4    5    Strongly agree

6. The naming and labelling of the links were clear \*

Strongly disagree    1    2    3    4    5    Strongly agree

7. It was necessary to scroll often to reach desired information \*

Strongly disagree    1    2    3    4    5    Strongly agree

8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



*User Testing - User 5*

## B.2.6 Test User 6

1. Enter Name and Surname \*

Tommaso Polloni

2. The used terminology was understandable throughout the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

3. Under each section of the website, the web pages were well organised \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2 (filled)    3 (filled)    4    5    Strongly agree

4. There was too much information on individual pages \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

5. The navigation bar was helpful \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4    5 (filled)    Strongly agree

6. The naming and labelling of the links were clear \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

7. It was necessary to scroll often to reach desired information \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3 (filled)    4    5    Strongly agree

8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



## B.2.7 Test User 7

1. Enter Name and Surname \*

Andrea Giarduz

2. The used terminology was understandable throughout the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

3. Under each section of the website, the web pages were well organised \*

Strongly disagree    1    2    3    4    5    Strongly agree

4. There was too much information on individual pages \*

Strongly disagree    1    2    3    4    5    Strongly agree

5. The navigation bar was helpful \*

Strongly disagree    1    2    3    4    5    Strongly agree

6. The naming and labelling of the links were clear \*

Strongly disagree    1    2    3    4    5    Strongly agree

7. It was necessary to scroll often to reach desired information \*

Strongly disagree    1    2    3    4    5    Strongly agree

8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*

Strongly disagree    1    2    3    4    5    Strongly agree

9. I learned to use the website quickly \*

Strongly disagree    1    2    3    4    5    Strongly agree

10. The navigation was always intuitive \*

Strongly disagree    1    2    3    4    5    Strongly agree

11. While using the website I often felt disoriented \*

Strongly disagree    1    2    3    4    5    Strongly agree

12. It was easy to find the information I needed on the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

13. The text shown on the website was always clearly readable \*

Strongly disagree    1    2    3    4    5    Strongly agree

14. Pages were structured and displayed in an effective way \*

Strongly disagree    1    2    3    4    5    Strongly agree

## B.2.8 Test User 8

1. Enter Name and Surname \*

Olimpia Rivera

2. The used terminology was understandable throughout the website \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

3. Under each section of the website, the web pages were well organised \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

4. There was too much information on individual pages \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

5. The navigation bar was helpful \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

6. The naming and labelling of the links were clear \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

7. It was necessary to scroll often to reach desired information \*

Strongly disagree    1    2    3    4    5    Strongly agree

Strongly disagree    1    2    3    4 (filled)    5    Strongly agree

8. The "Search Function" was helpful and reliable

*Answer only if you used the "Search" function*



9. I learned to use the website quickly \*



10. The navigation was always intuitive \*



11. While using the website I often felt disoriented \*



12. It was easy to find the information I needed on the website \*



13. The text shown on the website was always clearly readable \*



14. Pages were structured and displayed in an effective way \*



*User Testing - User 8*