UNIVERSIDADE DE LISBOA

FACULDADE DE MOTRICIDADE HUMANA

Rotating homepage carousels and its effects over news memorization

A Dissertation Submitted for the Degree of Master in Ergonomics, Usability and User Experience

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2018

Appreciation

Dedicated to my family and specially to my grand father for the great wisdom on the art of questioning reality.

I would also like to thank to Professor Dr. Paulo Ignácio Noriega, for all the wise advices, the resilience for never giving up and for passionate discussions on cognitive ergonomics.

Abstract

The carousel's system to display highlights combining image and text is a popular user interface element amongst informational (media news publishers) and transactional websites (e-commerce). The effects of two carousel variables over evocation of news were studied: Number of news in the carousel (7 or 14) and interaction mode with the carousel (Automatic or Manual scroll). 60 participants were divided into four groups of 15 subjects each: 7 news into an automatic scroll; 14 news into an automatic scroll; 7 news into a manual scroll; 14 news into a manual scroll. Evocation was evaluated by an open-response questionnaire after the carousels exhibition to test participants. An interaction effect was observed. With 7 news, evocation was higher in the automatic carousel and worst in the manual. With 14 news, evocation was worst in automatic carousel and best in manual. Concerning memorization of news, decision about carousel's mode to use, are not independent of the number of news.

Keywords: Web carousel, Memory, Evocation, Usability, UX, Cognitive Ergonomics, Design Psychology¸ Content Carousel, Navigation, Visual Design

Contents

Introduction

The news presentation or products offers in carousel format on web pages is a common technique quite widespread. Its efficiency in capturing the interest in reading, attention and memorization indexes have been under discussion with few evidences to prove or measure the efficiency of this system. According to Pernice, K. (2013), news display in carousel format, usually, presents the following characteristics:

- Appears at the top of the main page of a website (homepage);
- Occupies a substantial part of the visible screen for the user (page fold);
- Different contents appear in the same space;
- There is an indication that is possible to navigate between contents. The navigation is typically done horizontally, although there are also examples of navigation done vertically via thumbnails in desktop versions;
- The contents presented in each frame contains a large picture and a small amount of text;

Some carousel formats present an automatized movement, with a range of seconds between the highlighted content. There are also manual carousels formats, allowing the manipulation of the content by the user. Finally, the mixed ones have an automatic presentation of the content but at the same time allow to the user himself manipulate the content. Ordinarily the images and the titles of the elements presented on the carousel system are clickable and send the user to the webpage that contain the development of that content.

The trend

The news publication in carousel formats is a way to transmit the most used information, as this allows publishing a variety of news in the same page space. However, it is not proved this is the best system of presenting information in what concerns evocation. If the carousel, typically, is in a favorable location, which means “above the fold” in a desktop environment, that may be effective in attracting the attention of the users to see the content in that location (Schade, 2015). However, it can become inappropriate and distracting when the focus should be another content within the same webpage, due to its dynamism and movement (Burke, Hornof, Nilsen, & Gorman, 2005). There is a trend to use this carousel system in some media websites (we evaluated the Portuguese ones) to highlight the news trough this system.

A report from Baymard Institute (Baymard Institute, 2016) noted that carousels are hugely popular on e-commerce sites, especially on the homepage. In fact, 52% of the top US e-commerce sites have a carousel on the homepage of their desktop site. And they are as popular on mobile sites; the mobile usability benchmark reveals that it’s 56% of mobile e-commerce sites that have a homepage carousel.

Given this popularity and usage of such an interactive tool to display content and products, we pushed the following questions: can the titles of the news presented in a carousel be retained in the memory in equal form? Could it be the carousel the most appropriate system to show the important content on a news website?

Other studies

In a usability study done in the U.K. For Siemens appliances (Nielsen, 2013) it was given to the user the task to discover special promotions presented as news in a system of carousel with automatic advance of 5000 ms. As a conclusion the use of carousel systems with automatic advance is not advised for the following reasons: the movement takes the user to associate the text to the advertising content and its consequent devaluation; the probability to read an item that is in permanent turnover is lower than in static items. On the other hand, it was concluded that the presence of more than 5 elements in rotation decreases the capacity of recognition of the elements presented.

Paul Kelly from the University of York examined how effective the carousels are in terms of conversion (Kelly, 2013). The researcher used the institution homepage which displayed a carousel with an auto-advancing system and with controls for pagination and pause / resume. During this research it was tracked the number of clicks on the carousel slides. The most attention slide was in first position - around half of the clicks were on the first slide, with numbers dropping off rapidly after that. He decided to reduce the number of items on the website in the carousel to a maximum of five. New testing showed consistently more clicks on the carousel than when there were more features to choose from.

On the University of Notre Dame website, Erik Runyon tracked the number of times carousel features are switched by users, total feature clicks and total clicks per position (Runyon, 2013). The number of clicks were recorded through Google Analytics Events and compared to the number of visitors to the homepage. Approximately 1% of visitors click on a feature. There was a total of 28,928 clicks on features for 3 months' time. The feature was manually

"switched/rotated" a total of 315,665 times. Of these clicks, 84% were on stories in position 1 with the rest split evenly between the other four (around 4% each).

On VSB, Technical University of Ostrava it was presented a study using eye tracking techniques to investigate user reactions for content sliders (Radecký & Smutný, 2014). This study looked at how users react to different kind of navigation and layouts of the sliding banners. The eye-tracking results (Duchowski, 2017) suggest that it is effective to combine navigation arrows and visualization of the direct links to all the contained images (bullets, numbers) in the sliding banners. Also, rather avoid using reduced-size versions of pictures (thumbnails) as they reduce the quality of cognition of the main image. The number of slides used in content slider is important because the attention of users is directly proportional decreases by the number of images.

Another research used data coming from several mid-sized to large e-commerce websites over a period of 11 months using Mobify, a platform used to increase speed of mobile e-shop access (Peatt & Maclachlan, 2015). During this time, it was sampled approximately 7.5 million carousel interaction events.

In total, there were 2.4 interactions per carousel impression on average. This shows that for the 72% of visitors who did interact with the carousel, interacting with it many times was the norm. Users who interacted with thumbnails did so way more often than with any other control system on the carousel. On average, a user would interact with 6 thumbnails when they used the carousel. Swiping and arrows both had similar numbers of interactions: 3.5 and 3.9 on average. The low number of zoom interactions shows us that users only zoom on product pictures when they have a high level of interest.

This research found little in common with the data presented by Erik Runyon for Notre Dame. Users interacted with e-commerce carousels at a higher rate. They also interacted with additional slides at a rate that is much higher than the Notre Dame study data suggests.

The success criterion for Erik's carousels is users clicking through to the content offered by the slides. The success criterion for e-commerce carousels is users navigating to the next slide and seeing all the images. With this e-commerce carousel data, it was modeled the likelihood of a user interacting again after each interaction. In the case of slide advancement, this means advancing from the second to the third image after the user has advanced from the first to the second. In the case of direct interaction, this means tapping on the zoom of each slide after the first image.

There is also a limitation while comparing findings of Mobify research to those of Notre Dame. The goal of a user on an e-commerce website is to discover information about products to make a purchasing decision. The goal of a user on an educational website is to learn more or find specific information about the university. The authors of Mobify research also remarks that data collected in carousels interaction are only on mobile devices. On the other hand, Notre Dame's carousel is only on desktop devices. This difference highlights the possibility that mobile users interact with carousels more than desktop users. A possible reason advanced by Kyle Peatt, but not supported by data, is that the ease of interaction in mobile with swiping or controls is less demanding in effort relative to the smaller control target sizes of a mouse in a desktop.

Objective

Although there are references and other studies about news presentation in carousels accompanied by sequentially images, it is noted that the approach to the overall characteristics of this system with the user interaction and memory process is scarce.

Previous concerns on the issues of this system, don't consider the effects of the quantity dimension and the possibility of interaction on the same space and time.

This study aims at exploring the effect of these two variables in the process of news memorization considering: the number of news presented on the carousel, 7 and 14 news headlines; the possibility of user interaction, including an automatic scroll, which the user does not control, and a manual scroll which allow the user to have full control of the carousel.

Both variables were manipulated using a slideshow (a reproduction of a carousel), composed by textual news headlines and accompanied by relational images, in order to understand the memorization performance on this type of system.

We are expecting that our dependent variable, memorization index (evocation of news) will be higher with less quantity of news and higher with manual scroll, because participant can change headlines at the speed he desires.

Method and Instruments

Participants

Participated in this study a sample of 60 subjects (33 male; 27 female) aged between 18 and 65 ($\bar{x}$=32.03) and with a level of education ranging the primary education and college education. The sample was randomized into four groups of 15 participants each.

Design

Participants were divided into four groups of 15 elements each:

- Group 1: 7 news into an automatic scroll;
- Group 2: 14 news into an automatic scroll;
- Group 3: 7 news into a manual scroll;
- Group 4: 14 news into a manual scroll.

To all participants were displayed a number of news headlines accompanied by related images. The automatic scroll was parameterized to display a range of 5000 ms between each news headlines. This duration was set after the observation of the intervals practiced by the Portuguese online media, which use the carousel system. The manual scroll was controlled with the mouse click.

To avoid order effects, it was created different news sequences. Three for the 7 news and other three for the 14 news. A counterbalance was made, therefore, each group of 5 participants was exposed to the same headlines stream, as follows:

- Sequence A of headlines given to 5 participants;
- Sequence B of headlines given to 5 participants;
- Sequence C of headlines given to 5 participants.

Instruments

Carousel

It was created a carousel system composed by a set of news titles and images. It was conceived four versions of the carousels with the two types of scroll interaction (automatic and manual) and two different quantities (7 news titles and 14 news titles).

Therefore, was obtained a carousel with 7 news titles with an automatic scroll and a carousel with 7 news titles with a manual scroll (see Figure 2. Set of 7 images to test carousels with 7 news). It was also obtained a carousel with 14 news titles with an automatic scroll; a carousel with 14 news titles with a manual scroll (Figure 3. Set of 14 images to test carousel of 14 news).

Each carousel contains one image and one lower bar where it had the title of the news. The navigation between topics was always a horizontal one and sequential (no repetition, nor loops).

All these versions had an initial slide with the protocol instructions of what the participant should proceed and one last slide with the link to fill out the questionnaire and a thank you note for participating.

Procedure

The experiment took place in different spots such as classrooms and meeting rooms, but the isolation from external disturbances, which could influence the interaction, was a common matter. Each participant interacted with a computing device (laptop or tablet) individually and before one monitor, at least. A test protocol was established, explaining that the participant would read a controlled number of news (the series of 7 headlines or the series of 14 headlines) and how the display system should behave (with an automatic or a manual scroll). It was stated that

the experiment evaluation was about the interaction between the sample and the system and not about the individual performance of each participant. There was no mention towards the intention of the test in what regards memory measurement.

Assured the allocation of one of the carousel versions to each participant, the sequence of slides was displayed only once. Given the visualization, it was not allowed to the participants a review of the headlines, they were sent directly to the questionnaire.

Before the passive monitors supervision, each participant filled in the questionnaire according to the information recovered from the memory. Whenever it did not happen, they were allowed to answer with “I do not know" or "I do not remember".

The experiment ended after the questionnaire submission.

Questionnaire

It was created two versions of the questionnaire, one version with 14 questions for the carousels with 14 news titles and another one with 7 questions for the carousels with 7 news titles. Despite of the two versions, the questionnaire’s format was similar. After the headlines’ visualization, the participants proceed to the questionnaire (Google Forms format) where they were instructed to complete a number of questions using an open response approach. Each participant had to complete the sentence with what he remembered about the headlines previously read. A section of sociodemographic data was also on the questionnaire. Questions were mostly built by the grammatical assembly between subject and predicate, and participants were asked to complete the sentence using the reported speech (direct or indirect speech). After the questionnaire submission, an excel file was created for further SPSS analysis.

News headline

The news headlines, and the corresponding images presented to the participants of the sample were taken from the online publications of two important Portuguese media websites (*Público* e *Diário de Notícias*). The titles presented are thus real and were subject to professional editing criteria governing the editorial status of the media above. In this context, the news selected was indexed in 7 areas of interest: Economics, Sports, Science, Culture, Technology, Health and Policy. When the 14 news headlines were displayed, each topic of interest was repeated.

Memorization Index

To classify the responses of the participants, a memorization news index (IndexM) was created. The index had four rating layers punctuated by a numerical value scale.

With an increasing orientation, the index works as follows: when a response is given with references or terms that are not present on the news headline, or when there is no response at all, the score has a value of zero (0) points; when the response expresses an idea, although tenuous than it was reported on the news headline, and herein, it is regarded the reference to some terms with verb or noun features (it is not regarded any articles or adverbs) present on the original news headline, the scores has a value of 1 point; when the answer given by the participant conveys the idea of the news headline, even if he or she call on to synonyms or verbs of similar meaning, but not change the main content, the score has a value of 2 points; when the answer is the full transcript or reference (it is not regarded the absence or exchange of articles, when the perception of transcription is not distorted), the score has a value of 3 points.

The concept of this new rating index is based on the language functions of syntax and semantics. The first relates to the superficial aspects of language: its structure and shape, in a set of rules that combines the creation of words and sentences. The second relates to the significance of these same constructions. The structure of a word is necessarily linked to the semantics so that its meaning can be understood.

The adaptation of the "working memory model for the acquisition of speech" by Nick Ellis (Ellis, 2001) on the understanding of the information storage processes, it was essential to build the index's filter base. This model is based on three increasing filter layers on the acquisition of language, on the auditory inputs and on the vision inputs. We perceived that auditory inputs could be addressed as an internal resonance box inside the brain while reading information (in this case, in news headlines forms), since the participant ends up creating internal sounds, during the reading process, to assimilate what it was read.

Therefore, we have matched the first level, about the absorption of a phoneme, with the sound acquisition of phonemes during the exhibition and the display of the news headlines; the second level, the word acquisition, was matched with the second layer in the index (an answer with a word or term present in the news headlines); the third level, the acquisition of the sentence, was matched with the third and fourth levels of the index (when the participant expresses the full idea or transcribe the headline in a complete way).

Statistics

The processing of data and their statistical analysis was performed in SPSS 22. The whole data analysis was performed by using a significance value of p=0,05. Initially, it was made a descriptive analysis of the score of the memory index due to the number of news and the type

of scroll, announcing the mean, minimum and maximum score values. It was developed a detailed descriptive analysis of each question according to the number of news and the type of scroll to find out the questions with the highest and lowest score.

Comparing the mean values of the memory index scores of the 14 news titles group with the 7 news titles groups index score the investigator used a Student's t test with Greenhouse correction.

To find out if there were differences between the scores in both types of scroll, manual and automatic, was used a nonparametric Mann-Whitney test, once the sample with the automatic scroll did not had a normal distribution.

To analyse the differences between the mean values of the scores of the group who read 14 news and used the automatic scroll and the group who read 7 news with the manual scroll, the researchers used the Student's t test.

Results

The data of memorization index (IndexM) was converted for percentage. The maximum score (100%) possible for the 14 news, was 42 (3 maximum score for evocation of each individual news * 14 news). The maximum score (100%) possible for the 7 news, was 21 (3 maximum score for evocation of each individual news * 7 news). Table 1 presents average and standard deviation for each independent variable (number of news and type of carousel) as well for its two levels.

Relating type of carousel, the automatic had an average percentage of 35.4 and the manual 32.9%, with only a difference of 2.5%. Concerning number of news, the average percentage of 7 news was 37.6 and for the 14 news it was 30.7% with a difference of 6.8%.

Table 1. Average and Standard Deviation of IndexM for scroll type and number of news.

		Automatic	Manual
		X=35.4 sd=17.8	X=32.9 sd=15.1
7 headline news	X=37.5 sd=18.2	X=42.2 sd=17.7	X=32,7 sd=18.1
14 headline news	X=30.7 sd=13.9	X=28.6 sd=15.6	X=33,1 sd=12.1

As we can see in Table 1 and Figure 1, variation of results is higher when the levels of each independent variable is cross analyzed. For carousel with 7 news, IndexM percentage was 42.2 in the automatic scroll and decreased to 32.7% with the manual Scroll. Thus, is a difference in IndexM of 9.5%, but with no statistically significant differences (t=1.457; p=0.156). For the carousel of 14 news, there is a IndexM of 28.6% for automatic scroll, and for the manual 33,1%. In the 14 news, there is an increase of 4.7% from automatic to manual, but also with no statistically significant differences (t=-0.872; p=0.390).

A vertical lecture of results, by column, show in Automatic scroll, a higher IndexM for 7 news (42,2%) than 14 news (28,6%), that represent a statistically significant difference (t=2.239; p=0.033) in the IndexM of 13,6%. In the manual scroll, the values of IndexM for 7 and 14 news was very close, 32,7 and 33,1 respectively, with no significant differences (t=-0.057; p=0.955).

To check for interaction effects of quantity of news and type of carousel, a twoway anova was executed. There were no significant effects neither of quantity of news (f=2,508; p=0.119) neither scroll type (f=0.364; p=0.559). Despite no significative interaction effect was observed (f=2.84; p=0.097), value of p, was close to a significant value.

Conclusion and discussion

Through this study, the researchers wanted to understand which characteristics a carrousel system should have to best contribute to the memorization and consolidation of news presented on webpages.

Regarding carousel, we were expecting that memorization would be higher with less quantity of news headlines and higher with manual scroll.

First hypothesis is only true for the automatic scroll, memorization is higher for 7 news. In the manual scroll there is no difference in memorization of news between 7 and 14 news headlines in the carousel.

The second hypothesis is not confirmed: in the manual carousel there was not a better memorization than in the automatic.

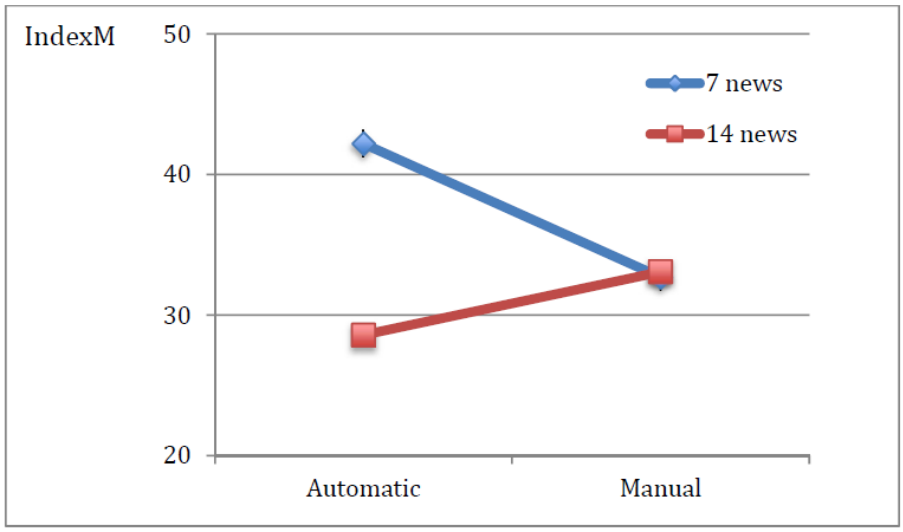

Figure 1. Average values of IndexM for scroll type and number of news.

For a clear understanding of these results, we may consider an interaction effect of number of headline news and type of carousel. With 7 news, evocation was higher in the

automatic carousel and slightly worst in the manual. With 14 news, evocation was worst in automatic carousel and slightly better in manual. Thus, if the carousel is automatic, there is a better memorization of few headline news, but if carousel is manual, there is no difference in the number of news memorized. However, as the interaction effect was only close to significant value, we cannot support this conclusion without increasing the sample of the study.

At the beginning, it was predicted that the memory index was higher in the carousel system with a manual scroll than with an automatic one. This hypothesis has not been proven by statistical tests, which showed there were no significant differences among the memory index both in manual and automatic scroll.

To try to explain this result, it is assumed that the time set for change of news on automatic scroll is approximately equal to the time the participant need when using the manual scroll (5000ms). This is a possible explanation to understand why there are no differences in memory index in both scroll conditions.

It was confirmed that users can have better memorization over news headlines when they are presented in lower quantity, an evidence in previously studies performed over the memory.

What this research also intended to prove was that when the carousel system was controlled by the users it would ensure a better memory. In contrast, the automatic system would have a worse memorization.

It was not possible to obtain favourable results to confirm the above hypotheses, but they leave clues for future studies and indicate that the time set for the display of the news headlines is a component key to take into consideration.

Another important aspect was the use of a qualitative rating system, which involves some subjectivity.

Although the results cannot prove all the hypotheses, it has been concluded that the carousel system is a good mechanism to put in evidence and to understand the memory processes.

The human brain is articulated to recognize things instantly, however to recall the memory without any perceptive support, the brain assumes a worse performance (Johnson, 2010). During the evaluation of the responses from the participants was noticed an association in the image accompanying the exhibition news, through references to them with words or ideas. Through an index that identified the presence of this phenomenon, it was found that when the additional image information has identified some entity, object or symbol, the priming effect increases (Doyen, Klein, Pichon, & Cleeremans, 2012). The interpretation of sentences, in this case, presented in the news, it was not only influenced by the meaning of words but, above all, the meaning of the image (Goldstein, 2015). A more complex class of this phenomenon led the participants to evoke associations to contexts through image memorization, which linked to the text of the news they had to complete. This point is unveiled on the presence of more detailed descriptions of the reported cases that were not originally present in the news titles presented. It was observed, then, that in addition to a working memory recall by the participants, in the identification of news they had to fulfil, they recall to long - term memory to understand the meaning of words to use in their answer. This situation gives focus to the dynamic aspects of long-term memory, that emphasizes not only by storage capacity, so as it interacts with working memory (Goldstein, 2015). This succession of phenomenon’s also allows for the understanding of other memory components, when in sequential interaction with the subject, they evoke each other.

Some limitations of the study may be presented. Between the 11th and the 15th of January 2016 (period of the data gathering for this study), the Portuguese news media broadcasting had three main subject driving their agenda. At national level, the presidential running campaign was very intense at a political level, influencing the amount of news published around this topic. The second most important topic was the crisis around the sportive performance of one Portuguese football club, usually a strong and an historical candidate to win the national title. Finally, the international agenda of news was highly focused on the death of two artistic celebrities, whom touched the heart and feelings of different generations. Both deaths were caused by cancer. A more detailed analysis of results, not presented here show the percentage of correct answers in news related with the above topics was higher than the other topics. Keywords like “cancer”, “Porto” (name of the football team) and “presidency” were spontaneously mentioned in answers even when they were not part of the original title of news. The presence of the three mentioned topics on the news might have influenced results. Due to this cognitive reinforcement, some users felt confident enough to add terms or keywords to news headlines even if those terms were not written on the original title of the news.

Size of sample in each group, should be at least of 30 participants, in order to increase power of statistical tests, and get stronger support to our conclusions.

During this study it was not evaluated user behaviour with carousels on mobile devices. In many cases, carousels are simply not optimized for mobile viewing. Scaling down isn’t the answer—images becomes impossible to read or even cut off from view. They also affect site loading times, which could affect performance affecting negatively the user experience. On the other hand, there are new interfaces and gestures more related with mobile devices, generally named NUI (Natural User Interfaces) that could facilitate navigation and memorization of

content displayed in a carousel system (O 'hara et al., 2012). In a column for magazine Interactions (Norman & Nielsen, 2010), Norman pointed out that the rush to develop gestural interfaces well-tested and understood standards of interaction design were being overthrown, ignored, and violated. Despite new technologies require new methods the refusal to follow well-tested, well-established principles can lead to usability disaster. Nielsen Norman group performed usability tests on Apple's iPad (Nielsen & Budiu, 2011), reaching similar conclusions. It could be interesting to evaluate the ease of interactions like swiping or other gesture controls in mobile devices relative to the smaller control target sizes with a mouse, mostly used in desktop environment. Bottom line, a new research could evaluate if there is a chance that mobile users interact with carousels in more natural and easy way than desktop users.

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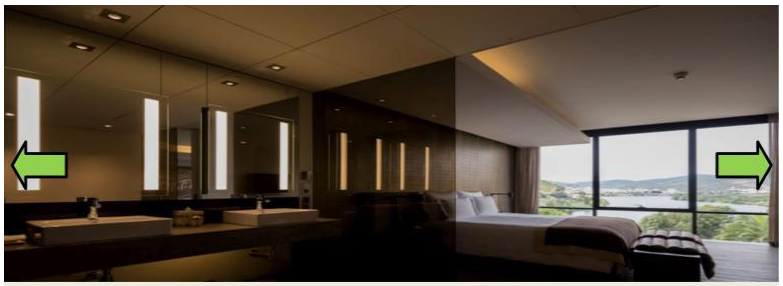
Figure 2. Set of 7 images to test carousels with 7 news

Duas mulheres candidatas
representam uma "viragem" na política portuguesa

Governo prolonga prazo para os consumidores
pedirem restituição das cauções

Treino sem sobressaltos após noite agitada

Aparelho experimental português
detecta doenças neurodegenerativas mais no início



Comentários nas redes sociais
são mais importantes do que o número de estrelas do hotel

Antigo bombeiro voluntário fez o transplante mais extenso de cara

Diário de Anne Frank publicado online,
apesar do conflito sobre direitos da obra

Figure 3. Set of 14 images to test carousel of 14 news

Isabel dos Santos quer passar
a dominar banco do BPI em Angola

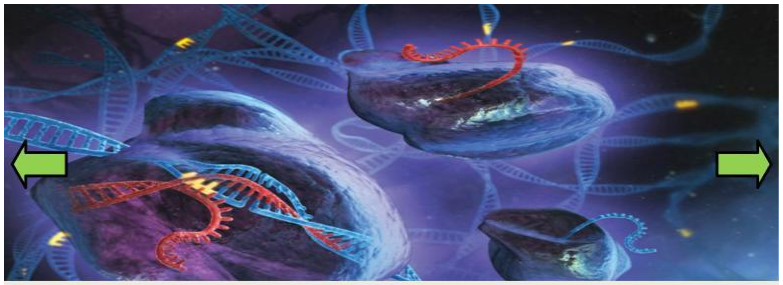
Duas mulheres candidatas
representam uma "viragem" na política portuguesa

Governo prolonga prazo para os consumidores
pedirem restituição das cauções

Ajuda do BCE à retoma é anulada pela crise dos emergentes

Treino sem sobressaltos após noite agitada

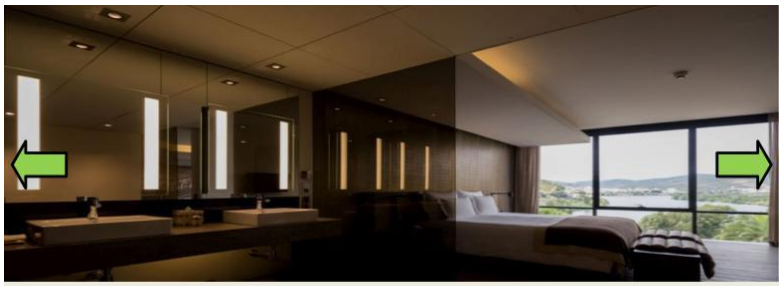
Equipa do FC Porto recebida com insultos



Nova técnica de edição genética pode
permitir tratar forma de distrofia muscular

Aparelho experimental português
detecta doenças neurodegenerativas mais no início

Apple vai pagar 318 milhões ao fisco italiano



Comentários nas redes sociais
são mais importantes do que o número de estrelas do hotel

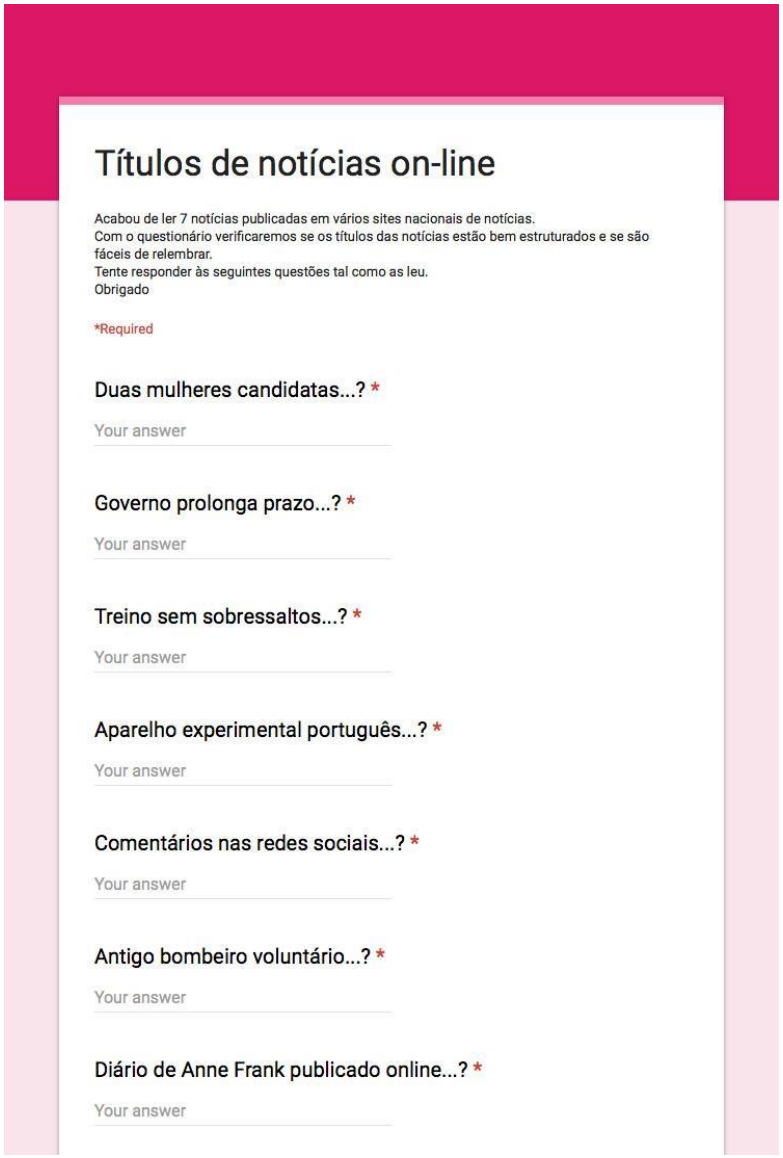
Antigo bombeiro voluntário fez o transplante mais extenso de cara

Universidade de Coimbra vai
patentear novo meio de diagnóstico do cancro

Diário de Anne Frank publicado online,
apesar do conflito sobre direitos da obra

Réplicas do MNAA que resistirem na rua vão ser leiloadas

Figure 4. Image of the form for the memorization of 7 news carousel



Títulos de notícias on-line

Acabou de ler 7 notícias publicadas em vários sites nacionais de notícias.
Com o questionário verificaremos se os títulos das notícias estão bem estruturados e se são fáceis de relembrar.
Tente responder às seguintes questões tal como as leu.
Obrigado

*Required

Duas mulheres candidatas...? *

Your answer

Governo prolonga prazo...? *

Your answer

Treino sem sobressaltos...? *

Your answer

Aparelho experimental português...? *

Your answer

Comentários nas redes sociais...? *

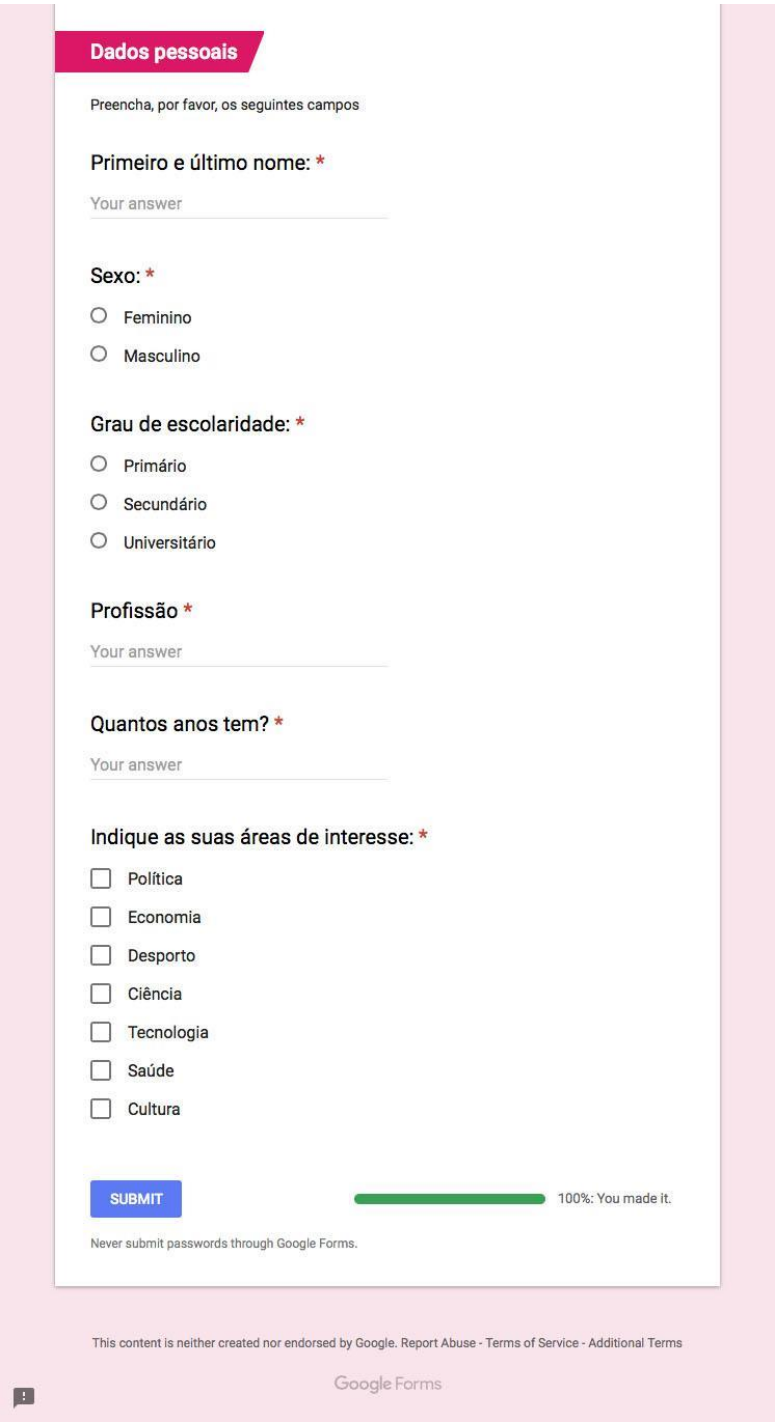
Your answer

Antigo bombeiro voluntário...? *

Your answer

Diário de Anne Frank publicado online...? *

Your answer



Dados pessoais

Preencha, por favor, os seguintes campos

Primeiro e último nome: *

Your answer

Sexo: *

- Feminino
- Masculino

Grau de escolaridade: *

- Primário
- Secundário
- Universitário

Profissão *

Your answer

Quantos anos tem? *

Your answer

Indique as suas áreas de interesse: *

- Política
- Economia
- Desporto
- Ciência
- Tecnologia
- Saúde
- Cultura

SUBMIT

100%: You made it.

Never submit passwords through Google Forms.

Figure 5. Image of the form for the memorization of 14 news carousel

Títulos de notícias on-line

Acabou de ler 14 notícias publicadas em vários sites nacionais de notícias.
Com o questionário verificaremos se os títulos das notícias estão bem estruturados e se são fáceis de relembrar.
Tente responder às seguintes questões tal como as leu.
Obrigado

*Required

Isabel dos Santos quer passar...? *

Your answer

Duas mulheres candidatas...? *

Your answer

Governo prolonga prazo...? *

Your answer

Ajuda do BCE à retoma...? *

Your answer

Treino sem sobressaltos...? *

Your answer

Equipa do FC Porto...? *

Your answer

Nova técnica de edição genética pode...? *

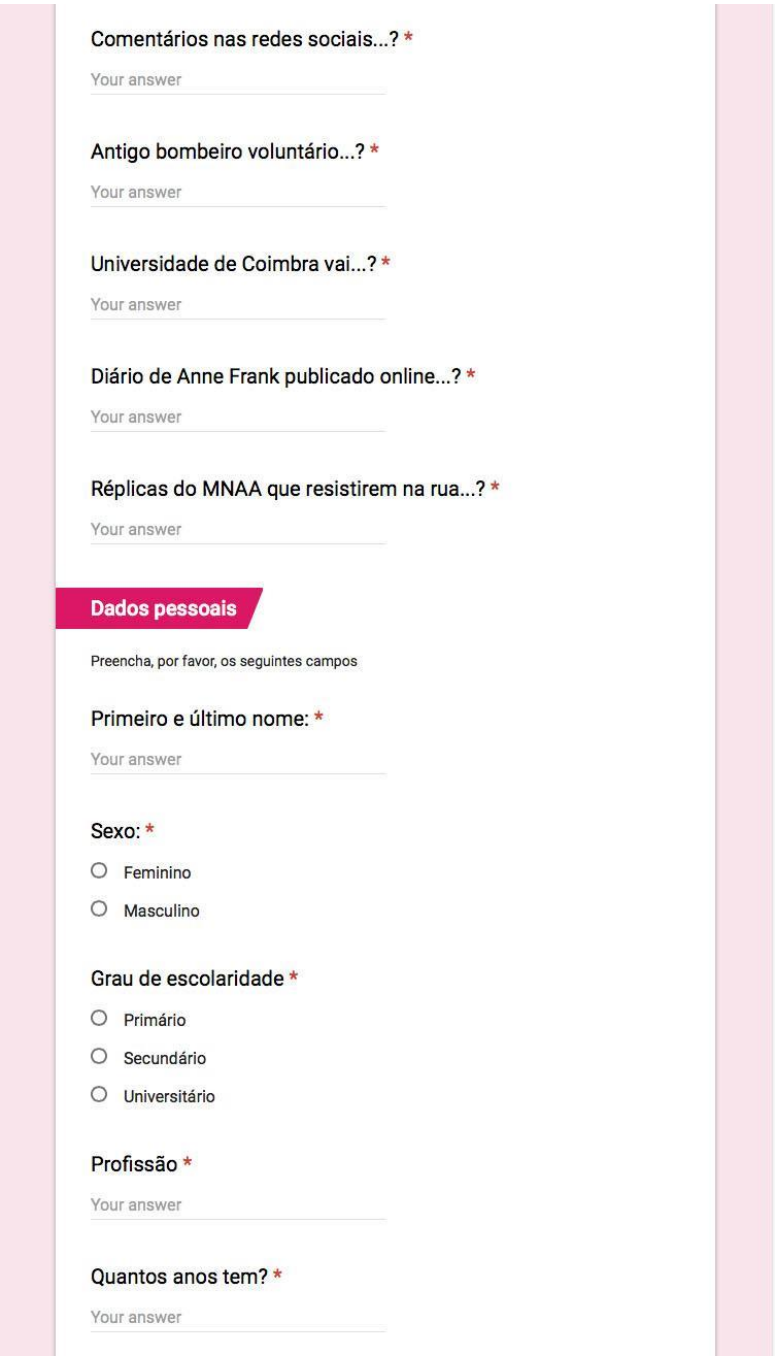
Your answer

Aparelho experimental português...? *

Your answer

Apple vai pagar...? *

Your answer



Comentários nas redes sociais...? *

Your answer

Antigo bombeiro voluntário...? *

Your answer

Universidade de Coimbra vai...? *

Your answer

Diário de Anne Frank publicado online...? *

Your answer

Réplicas do MNAA que resistirem na rua...? *

Your answer

Dados pessoais

Preencha, por favor, os seguintes campos

Primeiro e último nome: *

Your answer

Sexo: *

- ○ Feminino
- ○ Masculino

Grau de escolaridade *

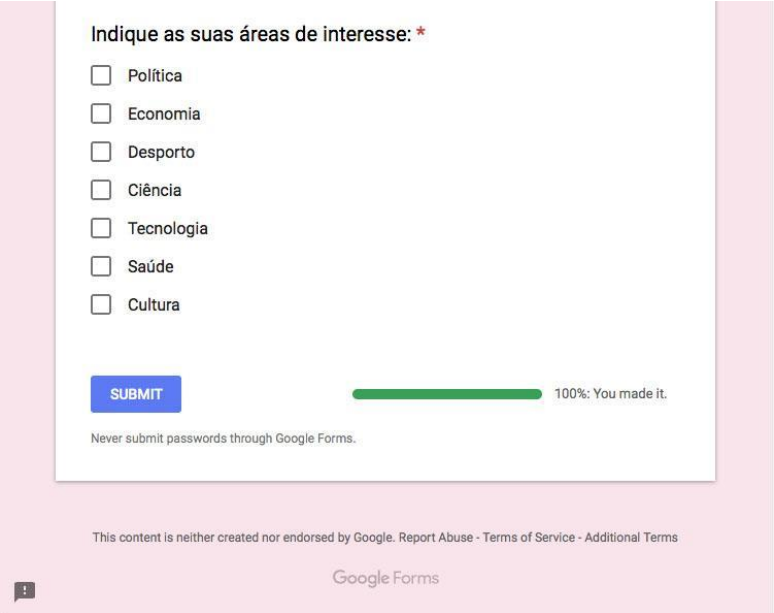
- ○ Primário
- ○ Secundário
- ○ Universitário

Profissão *

Your answer

Quantos anos tem? *

Your answer


Indique as suas áreas de interesse: *
Política
Economia
Desporto
Ciência
Tecnologia
Saúde
Cultura
SUBMIT
100%: You made it.
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