Language Navigation Patterns of Multilingual Screen Reader Users on Partially Localised University Websites

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Abstract

This paper summarises some of the findings from a web usability study conducted to investigate the impact of multilingualism and partial localisation strategies on the web navigation experience of screen reader users. More specifically, it reports on the language navigation patterns of 10 visually impaired individuals who browsed two multilingual Swiss university web portals. Although results are not conclusive, data gathered could serve as a starting point for discussion in future decision-making processes about how to design inclusive localised websites.

1 Introduction

In countries with more than one official language, multilingual websites should serve to ensure that the information needs of all citizens, regardless of their (dis)abilities, are met. In order to achieve that goal, localisation – understood as the process of linguistically, culturally and technically adapting web content– and accessibility best practices should be jointly implemented to guarantee an optimal web navigation experience for all. This is particularly relevant in the case of education-related web portals, as they are, for students, the first source of information about the existing academic offer.

Equality of opportunities in education for people with disabilities and specifically access to higher education is one of the aspects often advocated for in national and international legislation. While prior work has examined university websites from a localisation (Fernández Costales 2010) and an accessibility perspective (Acosta Vargas et al. 2016), both areas have rarely been studied together. The usability study presented here is a first attempt to address that research gap by observing how visually impaired users browse two multilingual websites of that genre.

2 Usability Study

The overall goal of the study was two-fold: (i) to observe the interaction of multilingual screen reader users with partially localised websites, and (ii) to assess the impact of the users' language selection and the implementation of different localisation strategies on the overall usability of multilingual websites. In this paper, we will focus on one of the aspects studied in relation to the first goal. Specifically, we will address the following research question: *What are the language navigation patterns of screen reader users when browsing on partially localised websites?* By language navigation patterns, we understand the combination of preferences, choices, needs and actions, as well as the impact of those on the language(s) in which the browsing experience takes place.

2.1 Test Websites

Two university websites[12] were selected from a list of 98 websites previously examined in a Swiss Accessibility Study conducted by the foundation Access for All (2016). They fulfilled the criteria defined for our study; i.e. being partially localised, moderately accessible (as per the 5-point rating scale used by Access for All), and available in two or more Swiss official languages (French, German, Italian). At the time of the study (May-June 2018), the website of the Zurich University of Applied Sciences (hereinafter Website A) was available in German, English, French and Italian, although the content had been reorganised and only partially translated into the last three languages. The website of the Bern University of Applied

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[12] Screenshots and links available at https://goo.gl/eBkovW

Sciences (hereinafter Website B) was available in German, French and English and offered a mirror structure in the case of the first two, even though some links, pages and PDF files were only available in German.

2.2 Design and Implementation

The call for participation targeting visually impaired speakers of Swiss official languages included a description of the scope of the study and a link to a recruitment form. It was drafted in German, French and Italian and sent via e-mail to associations all around Switzerland. After the recruitment period, the test sessions were conducted on-site, in a quiet environment and in the location chosen by each participant. During the test, instructions were read out aloud and participants were asked to complete three increasingly difficult tasks on both websites, as well as to answer some questions about their profile, language skills and navigation experience.

Given the fact that university Web portals tend to be more informative than interactive, the tasks designed mainly involved looking for specific information; for instance, finding the generic university e-mail address and telephone number, or looking for the date, time and location of the open days of a given BA. The level of difficulty assigned to each task depended on the availability of sufficient content in the desired language to accomplish the task and the degree of interaction required to complete the task successfully (i.e., number of sections to be visited, number of clicks, use of filters, etc.). Observation notes were taken during test sessions, which were also audio-taped. A more thorough description of the methodology followed in this study can be found in Casalegno (2018).

2.3 Participants' profile

A total of ten visually impaired screen reader users took part in the study. Five of them were native German (DE) speakers, three were native French (FR) speakers and two were native Italian (IT) speakers. Table 1 provides a summary of the language skills of the participants, including their native tongue (N) and their level of proficiency in the other languages available, as per the scale of the

Common European Framework of Reference for Languages (A1 to C2, here A to C).[13]

	German	French	Italian	English
01DE	N	A	C	B
02DE	N	C	C	C
03DE	N	A	B	C
04DE	N	B		C
05DE	N	B	A	B
01FR	B	N		A
02FR	A	N	A	C
03FR	B	N		B
01IT		A	N	A
02IT	A	C	N	C

Table 1. Participants' language skills

Three out of ten were accessibility experts, whereas the others were employees or students. They had all been using a screen reader for more than five years and were used to browsing the Web daily.

3 Findings

To shed light on the language navigation patterns adopted by the screen reader users who took part in the study, the abovementioned research question was broken down into four specific sub-questions: (1) *Which language did users instinctively choose?* (2) *How did users switch to their preferred language?* (3) *Why was the language changed during navigation?* (4) *What were the language skills of the users who voluntarily browsed in a different language?*

3.1 Language Preferences

Participants were free to choose their preferred language between those available. The language navigation pattern of native German-speaking participants (N=5, 50%) was very straightforward: when they inserted both addresses in the address bar at the top of the browser, they landed directly on the German homepages and did not change the language. French speakers (N=3, 30%) were positively surprised when they landed correctly on the French homepage of website B. For example, participant 01FR said '*Ok, en français : magnifique ! Comment ça se fait ? C'est peut-être mon adresse IP qui m'a mis directement en français ? C'est pas mal. Ça c'est un très bon point'.[14]* Yet, all of them changed the language

to French when they landed on the German homepage of website A. Finally, the two Italian-speaking participants (N=2, 20%) had different reactions when they landed on the German homepages of both websites. User 01IT switched to Italian when it was available (website A) and to English when Italian was not an option (website B). Participant 02IT, who switched to French on both websites, declared he knew that Italian was available on website A, but he decided not to select it because French came first [the 'fr' language code link title was read before the 'it' one by the screen reader] and he was used to it, as he had been living in a francophone country for years.

Not surprisingly, these findings indicate that the vast majority of screen reader users choose to navigate in their native tongue whenever it is available and that perceived usability improves when they land directly on the preferred language version. However, living in a foreign country for a long time may change their language preferences.

3.2 Language Selector

A previous exploratory study by Rodríguez Vázquez (2015) on the main difficulties faced by screen reader users on multilingual websites and their coping techniques identified the language selector as a potential accessibility barrier. In the tested websites, the most common issues with the language selector that Rodríguez Vázquez found, such as embedded links or flags without the appropriate text alternative, were not present. For website B, 80% of the participants (N=8) were satisfied with the language version they landed on, as it was their native tongue, so they did not attempt to change the language. The two Italian-speaking participants (N=2, 20%) who landed on the German homepage, easily found the language selector while they were exploring the homepage, before beginning with the actual tasks. They did so by letting the screen reader sequentially read the list of links. For website A, only 50% of participants (N=5, 50%) landed on the preferred version. Four out of five non-German-speaking users (N=4, 80%) found the language selector by simply exploring the homepage and reading the content sequentially.

One participant (N=1, 20%) had to look 'fr' up in the link list provided by the screen reader. This may suggest that visually impaired users living in a multilingual country are used to language codes. Interestingly enough, this practice goes against the one preferred by localisation and internationalisation experts in terms of language selector design, which consists of introducing the official name of the language in full (in this case: français, Deutch, italiano) (W3C, 2016).

3.3 Switching Language as a Coping Strategy

We also explored the circumstances that led some participants to voluntarily change the language *during* the test session. Out of five non-German native speakers, two (N=2) voluntarily switched to German in the middle of the session. Participant 01FR did it on website A, after repeatedly finding himself on the German version while looking for information on the French version. He said: "*C'est ça que c'est chiant : j'arrive pas à ouvrir le champ de recherche ou alors il me refout en allemand*".[15] Participant 01IT also did it on website A, when he guessed that what he was looking for was not available in Italian: "*Non c'è nessun link verso la School of Engineering. Immagino sia una pagina non in italiano. Facciamo che ci mettiamo in tedesco*".[16] The localisation strategy used in website A (reorganisation of content on the translated version) seems, therefore, not to be satisfactory for screen reader users, as they tend to get frustrated when a page is not available or perceive that something is missing.

3.4 Language Skills

Finally, we tried to understand whether a correlation existed between the participants' language skills and their language navigation patterns. We were expecting that people with a higher level would more often change language as a coping strategy, but our hypothesis was not confirmed. In fact, participants 01FR and 01IT, who voluntarily switched to German, reported a B level and no knowledge of the language respectively, whereas participants 02FR, 03FR and 02IT, who did not voluntarily switch to German, reported a level that varied from A to

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[15] "*What's annoying is I can't use the search box without reverting back to German*." Our translation.

[16] "*There's no link to the School of Engineering, so I assume it's not in Italian. Let's browse in German then.*" Our translation.

B (see Table 1). One possible explanation could be that switching to a foreign language depends on other subjective factors such as familiarity with multilingual websites, sense of initiative or problem-solving skills. However, data from a larger study would be needed to further investigate this hypothesis.

4 Concluding Remarks

The data collected showed that most screen reader users preferred to browse in their mother tongue. We also noticed that they were used to recognising the code of their preferred language when they heard it and that they were not keen on changing the navigation language to a foreign language, unless they were really stuck on a task - and sometimes not even then. These findings, although not generalizable due to the limited number of participants, provide insight into a new form of multilingual browsing experience that had not yet been studied in prior work. Future work could look at replicating the study with both sighted and visually impaired individuals, in order to see whether similar patterns are observed. It is also worth noting that the data presented in this paper is not sufficient to draw conclusions with regard to the usability of the two different degrees of localisation adopted in the test websites. For that, these data need to be interpreted in conjunction with the other observations made during the study in terms of the type and number of usability issues encountered by participants in both websites, and the scores of the usability questionnaire administered. The researchers plan to cover these aspects in a separate research paper in the near future.

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