

Preliminary Results from Pan-European RoboBraille Pilot User Study

By

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Abstract. During the winter/spring of 2007, the RoboBraille Consortium conducted the first of two pilot studies amongst users of the RoboBraille service. More than 700 users in five different countries were invited to participate in the questionnaire-based survey, and 179 users responded before the deadline. Users were asked to rate the service in seven different categories: Overall satisfaction, Support, Accuracy, Ease of understanding, Ease of use, Relevance and Quality. On a scale from 1 to 5 where 5 is best, RoboBraille scored 3.8 in Overall satisfaction, 4.2 in Support, 3.9 in Accuracy, 4.4 in Ease of understanding, 4.4 in Ease of use, 4.0 in relevance and 4.1 in Quality. The user feedback furthermore revealed that RoboBraille is mainly used for translation of educational material, manuals, articles and letters. Comments added by pilot users also suggest that RoboBraille leave people with reading difficulties better off in terms of independence, access to digital information, and self-sufficiency. Suggestions from pilot users included support for more document formats such as PDF, support for more output formats, e.g., DAISY talking books, and the ability for users to control the speech quality and rate. Few users appeared to have concerns with the service. Amongst those who had, worries related to the security and confidentiality of the service as well as to potential copyright violations. Some of the suggestions have been implemented in time for the second and final pilot study. Likewise, the concerns have been addressed through information on the service website.

1 Introduction

The RoboBraille service is an email-based service capable of translating documents into either synthetic speech or contracted Braille. The service is available free of charge to all non-commercial users and no registration is required. Comprehensive information is available at www.robobraille.org.

RoboBraille attempts to solve a universal problem as it makes textual information accessible to people who would otherwise find it inaccessible due to visual impairments or reading difficulties. Originally a Danish service, a pan-European consortium is currently validating RoboBraille in Cyprus, Ireland, Italy, Portugal

and the United Kingdom with financial support from the European Commission.

The Danish part of RoboBraille has been available since 2004; in January 2007, support for British English, Italian, Portuguese and Greek was added to the service. In June 2007, support for French and Lithuanian speech was added.

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2 Pilot Studies

As part of the pan-European validation of the RoboBraille service, two pilot studies amongst end users are planned. The purpose of the pilot studies is to validate the RoboBraille service technically, culturally and commercially in a real-world, multi-cultural and multi-lingual environment. The studies are used to collect quantitative as well as qualitative information. In terms of quantitative information, the studies have been designed to measure the following indicators on a scale of 1-5 (5 being best):

- Overall satisfaction with the service
- Quality of the service
- Accuracy of the service
- Relevance of the service

In terms of qualitative information, the studies have been designed to capture information within the following areas:

- Concerns with the service (e.g., privacy, confidentiality, Intellectual Property Rights (IPR))
- Suggestions, recommendations and ideas for improvements

The first pilot study has already been conducted. The second pilot study was launched in June and will conclude in September 2007. Between the first and the second pilot study, a number of modifications were made to the service, based on qualitative feedback from the pilot users.

3 The First Pilot Study

The first phase of the pilot test was conducted in period January – March 2007. Users from the five partner countries were invited to participate in the pilot test of the RoboBraille service, testing either the Braille service, Speech service or both. Due to technical difficulties, the Cypriot pilot only included the Speech services.

In addition to the five partner countries, an additional questionnaire survey was conducted simultaneously in Denmark. Since this is outside the scope of the eTEN Market Validation project, results from this survey are not listed in this paper. However, the results of the Danish survey will be used along the other surveys in order to improve the RoboBraille service.

The target number of test users is listed in the table below:

	Braille users	Speech users	Total
Italy	100	100	200
United Kingdom	100	100	200
Ireland	100	100	200
Portugal	100	100	200
Cyprus	50	50	100
Total	450	450	900

Table 1: Target number of pilot users

While the RoboBraille consortium remain convinced that it will meet the target numbers once the second pilot phase has been completed, it proved difficult to recruit an adequate number of users in all categories and countries. However, in addition to the users who actually signed up as participants in the pilot test, 2-3 times as many users actually used the service during the period.

The table below summarises the number of users who signed up to participate in each of the categories and countries, and who were eventually invited to complete a questionnaire:

	Braille users	Speech users	Total
Italy	44	134	178
United Kingdom	58	88	146
Ireland	101	101	202
Portugal	51	105	156
Cyprus	-	44	44
Total	254	472	726

Table 2: Actual number of pilot users

The users were invited by email to complete localised, web-based questionnaires. In addition to stating gender, age and document categories submitted to the service (Books of fiction, Articles, Educational material, Manuals, Web pages, Letters, Applications and other forms, Other documents), the pilot users were asked to answer the following questions:¹

¹ The British English questionnaire is used as a sample.

Satisfaction. The level of satisfaction is used as a general measure to determine how satisfied you are with the RoboBraille service

- On a scale from 1 to 5 where 1 is “Not satisfied at all” and 5 is “Very satisfied”, how satisfied are you with the RoboBraille service in general?
- Please add any comments you wish to make regarding your satisfaction with the RoboBraille service.

Support. Support is used to measure the perceived overall support level provided by Royal National College for the Blind.

- On a scale from 1 to 5 where 1 is “Very poor” and 5 is “Very good”, how do you rate the support provided by the Royal National College for the Blind?
- Please add any comments you wish to make regarding the support provided by the Royal National College for the Blind.

Accuracy. Accuracy is used to measure how accurate the Braille or text-to-speech translations appear to be.

- On a scale from 1 to 5 where 1 is “Very inaccurate” and 5 is “Very accurate”, how accurate to you rate the results of the materials produced by the RoboBraille service?
- Please add any comments you wish to make regarding the accuracy of the RoboBraille service.

Usability. The usability is used to measure how easy or how difficult users find it to understand the concept and use the RoboBraille service.

- On a scale from 1 to 5 where 1 is “Very difficult to understand” and 5 is “Very easy to understand”, how easy did you find it to understand the concept of the RoboBraille service?
- On a scale from 1 to 5 where 1 is “Very difficult to use” and 5 is “Very easy to use”, how do you rate the usability of the RoboBraille service?
- Please add any comments you wish to make regarding the usability of the RoboBraille service

Relevance. The relevance is used to measure how relevant you find the RoboBraille service compared to any available alternatives such as acquiring and install-

ing translation software on your own computer, relying on third party transcription services, etc.

- On a scale from 1 to 5 where 1 is “Not relevant to me at all” and 5 is “Very relevant to me”, how do you rate the relevance of the RoboBraille service?
- Please add any comments you wish to make regarding the relevance of the RoboBraille service

Quality. Quality is used to measure the perceived overall quality level of the RoboBraille service, considering factors such as response time, robustness, speed of translation, etc.

- On a scale from 1 to 5 where 1 is “Very low quality” and 5 is “Very high quality”, how do you rate the quality of the RoboBraille service?
- Please add any comments you wish to make regarding the accuracy of the RoboBraille service

Concerns. We would like to know if you have any concerns using the RoboBraille service. Examples of concerns could include fears that your privacy be violated, concerns over possible copyright infringements etc.

- Please add any comments you wish to make regarding concerns you may have regarding using the RoboBraille service.

Suggestions. We would like to know if you have any suggestions on how the RoboBraille service may be expanded or modified to better service your needs. Examples could include support for additional document formats, support for additional translation processes, support for additional languages, etc.

- Please add any suggestions you have regarding the future expansion and modification of the RoboBraille service.

4 Pilot Study Results

Of the 726 users invited to participate in the questionnaire survey, a total of 179 respondents had completed the questionnaires before the deadline.

4.1 Numerical ratings

The numerical ratings in the survey are summarised in table 3 below.

	Overall satisfaction	Support level	Accuracy	Easy to understand	Easy to use	Relevant to user	Quality of service
All	3.8	4.2	3.9	4.4	4.4	4.0	4.1
Speech, Cyprus	4.7	4.8	4.7	4.4	4.2	3.3	3.9
Speech, Ireland	4.3	4.6	4.4	4.5	4.7	3.8	4.3
Speech, Italy	3.8	3.7	3.7	4.3	4.4	4.3	3.8
Speech, Portugal	3.3	3.7	3.2	4.5	4.3	3.8	3.5
Speech, United Kingdom	3.6	4.4	3.8	4.4	4.4	4.0	4.1
Braille, Cyprus	-						
Braille, Ireland	4.3	4.6	4.2	4.6	4.6	3.8	4.4
Braille, Italy	3.0	4.0	3.5	4.5	4.5	4.3	3.8
Braille, Portugal	2.3	3.5	3.4	4.0	5.0	4.6	4.0
Braille, United Kingdom	3.6	4.1	3.9	4.0	4.2	4.0	4.3

Table 3: Numerical Ratings

The overall goal for the numerical ratings was that users confirmed their satisfaction with the service as well as the quality, accuracy and relevance of the service with an average score of at least 3.5 points on a scale of 1-5 (5 being best). As can be seen from the above table, this goal was met and exceeded in the combined sample as well as in the majority of all categories and countries with the following exception:

- The rating amongst Portuguese speech users of their overall satisfaction (3.3) and perception of the accuracy of the service (3.2). These, however, remain above the threshold on all other measures.
- The rating amongst Italian Braille users of the overall satisfaction (3.0). These, however, remain above the threshold on all other measures.
- The rating amongst Portuguese Braille users of the overall satisfaction (2.3) and perception of the accuracy of the service (3.4).

Analysing the potential causes for the lower-than-average ratings from the Portuguese speech users while comparing user comments suggested the main cause to be demographic. Hence, while the service is being validated in Portugal, a large proportion of the users requesting Portuguese speech files appears to be from Brazil, with a preference for Brazilian Portuguese.

Similarly, an analysis of the results from Italian and Portuguese Braille users suggests a combination of

very limited number of users and a failure to understand the need to convert the resulting Braille text to the character set of the target Braille device.²

4.2 Suggestions for improvements

In addition to the numerical ratings, the pilot users made a host of suggestions on how the RoboBraille service can be improved. These included:

Grade I British Braille. The validated version of RoboBraille only supported Grade II British Braille.

DAISY support. Support for structured audio books in the standardised DAISY format. This is especially useful for larger documents such as educational text books.

“Crude” file-partitioning for speech. An alternative to the standardised DAISY format. As audio files may become quite large and thus difficult to navigate, users expressed a wish to be able to have larger text files divided into smaller segments prior to audio conversion.

² As few (or too many) standards exist for character sets on Braille devices such as Braille displays, note takers and embossers, it is necessary to convert contracted text from the internal character set of RoboBraille, OctoBraille. OctoBraille is a Braille equivalent to the ISO 8859/1 character set also known as Latin 1. The character set conversion is handled automatically by RoboBraille by stating the name of a so-called export filter in the subject line of the mail.

Multiple-file attachment. The ability to attach more than one file to a request email to RoboBraille.

PDF support. The validated version of RoboBraille supported the following file formats: Microsoft Word (.doc), Rich Text Format (.rtf), HTML (.htm and .html), Microsoft Windows text files (.txt) and MS-DOS text files (.asc). PDF is widely used in the public sector when publishing a multitude of different documents and forms.

User-control of speech quality and speed. Many users were visually impaired and accustomed to listening to audio files at high speed. Users similarly expressed a need to be able to lower the quality of the speech to reduce the size of the audio file.

Web services alternative. Especially for institutional use, an alternative to the email-based interaction model was requested.

Formatting for embossing. The ability to format the resulting contracted Braille to the actual paper format of the Braille embosser while keeping track on print and Braille page numbers.

DRM support in audio files. Integration of some type of Digital Rights Management technology in order to protect the copyright of audio material produced by the RoboBraille service.

4.3 Concerns

While most users expressed no concerns at all with the service, those who did mainly had concerns in two different areas:

Privacy, sensitivity and security of the service. Some users expressed worried whether it was safe to submit personal, confidential or otherwise sensitive information to the RoboBraille service, and raised concerns on whether third parties might be able to access any such information.

Potential violation of the copyright legislation. Some users worried about potential copyright infringements when submitting copyrighted material to the RoboBraille services, raising concerns about whether the material could be made unintended available to third parties.

5 Conclusions

Although still preliminary, feedback from the user community confirms the value, relevance and quality of the service beyond doubt.

The second and final pilot test of RoboBraille commenced in June and will conclude in September 2007, bringing the number of pilot users well beyond 900. Prior to the launch of the second pilot test, a number of enhancements were made to the RoboBraille service. Based partially on user suggestions from the first pilot, these included:

- Improvement of British English Braille quality by improving the exception lists.
- Addition of administrative capabilities and facilities for remote supervision of the service.
- Addition of support Greek Braille based on an intermediate solution.
- Addition of speech quality control enabling the user to select the desired speech rate at 7 different levels (3 faster, 3 slower, 1 normal).
- Addition of support for French and Lithuanian speech.
- Improved stability and spam detection.

Furthermore, an FAQ was added to the RoboBraille homepage, addressing user concerns and misconceptions.

6 References

- 1 Lars Ballieu Christensen: RoboBraille – Automated Braille Translation by Means of an E-Mail Robot. K. Miesenberger et al. (Eds.): ICCHP 2006, LNCS 4061, pp. 1102 – 1109, 2006. Springer-Verlag Berlin Heidelberg 2006
- 2 Lars Ballieu Christensen and Svend Thougaard: Preliminary report on pilot test. Deliverable 4.3 in eTEN RoboBraille Market Validation. 2007 (available from the authors)