

Braille readers often have problems in having short documents transcribed quickly into contracted braille. Typical documents are agendas and minutes of meetings, instructions for domestic appliances, local telephone dialling codes, knitting patterns and personal correspondence needed for reference. Typically the number of copies required is from one to six. This project is concerned with investigating the viability of using a computer-based transcription system based on existing technology.

Introduction

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A Feasibility Study on a Braille Transcription  
Service for Short Documents

newsletter, bank brochures, annual report conference announcements and proceedings, school materials (assignments, reading materials, quizzes, games), and instruction manuals. Translation and other computer processing is done at the computer facilities of the UNI-COLL Corporation, Philadelphia. Editorial, embossing, and binding services are provided by Volunteer Services for the Blind, Philadelphia.

## Basic system

The basic system for producing short documents in contracted braille is:

- (i) A typist, with no computing knowledge, inputs the text on punched cards, paper tape or directly on a visual display unit. Control characters, for new paragraph etc., are also added by the typist as she inputs the material (i.e. the text is not annotated by someone else).
- (ii) A line printer listing of the text is produced in order to proof-read for typing errors.
- (iii) The text is interactively edited on a visual display unit with a program designed specifically for this purpose. This program has been designed for speed of operation, minimal computing requirement and for ease of use by operators with no experience of computing.
- (iv) The text is translated to a good approximation to Grade II standard English Braille, and the translation is stored on magnetic tape.
- (v) The braille is output on an on-line embosser.

Only the translation phase requires extensive central processor time; all other computer operations use less than 1% of the central processor time, and can be time shared with other unrelated programs.

The current output of the system is about 20,000 braille cells (circa 30 pages) per day. Allowing for multiple copies, such that on average about two copies of each document are produced, this means that 15,000 braille cells are translated per day, requiring about one to two minutes of central processor

time for translation. It is not envisaged that this can be increased with existing facilities (particularly staff) since the typist is currently the only full time worker on this project, and she also undertakes all proof reading and routine secretarial duties associated with the project.

#### Translation Program

The Sensory Aids Evaluation and Development Center provided Warwick Research Unit for the Blind with a copy of DOTSYS III which is a program, written in Cobol, to translate text to a good approximation to Grade II standard American-English Braille. The version currently in use at Warwick uses 13k words of store with initialisation overlaid and translates at 5000 words per minute to a good approximation to Grade II standard English Braille.

#### Evaluation

In order to evaluate the system a small scale pilot service was operated for producing single copies of short documents for blind subjects. In the first few months of operation the system was undergoing almost continual modification based on informal feedback from the blind subjects which made it impractical to start a formal evaluation programme.

The material transcribed can be roughly grouped as:

Subject	%
Miscellaneous	17.2
Employment	29.1
Education	25.4
Religious	2.5
Leisure	15.4
Domestic	10.4

Errors can be caused by typing errors in the text, incorrect control characters, incorrect choice of contraction by the computer program, malfunction of the embosser or damage to the braille in transit. Little is gained by just measuring the number of miscontractions caused by the translation program unless one also measures the error rates for the various systems using manual transcribers. Once the error rate is relatively low, it becomes a very expensive operation to attempt to measure it accurately.

A practical measure of the error rate is the number of users who find the number and types of errors unacceptable for their application. For instance any error in a list of telephone numbers is serious, but a miscontraction may often go unnoticed.

A braille questionnaire was circulated to subjects who had used material generated by the most recent system. The results are (N=23):

1. Mean age = 40.3 years ( $\sigma$  = 12.6 years)

2. Occupations

Professional	9
Non-professional white-collar	7
Students	2
Manual workers	1
Not employed	4

"The following 4 questions use a 1 to 5 scale for answering. For example 1 is very poor, 2 poor, 3 average, 4 good and 5 very good. You should just write down the number which best describes your own opinion. In these questions I have just given you the end points on the scale although you can answer with any number between 1 and 5".

3. For your applications, the turnaround time is: (1 is so slow as to make the service useless and 5 is perfectly acceptable).

<u>mean</u>	<u><math>\sigma</math></u>
3.8	0.9

	<u>Code</u>	<u>Number</u>
4. Are the misconceptions caused by the computer program: (1 is so bad as to stop you using the service and 5 is perfectly acceptable).		mean 4.6
		σ 0.6
5. Is the physical quality of the braille: (1 is very poor and 5 is good).		mean 4.3
		σ 0.9
6. Is single-sided, as compared with double-sided, embossing: (1 is so severe a disadvantage as to stop you using the service and 5 is perfectly acceptable).		mean 4.9
		σ 0.3
7. If there was a central document transcription service, or a number of regional ones, how much would you use it on average (braille pages per month):	1. less than 10 2. 10 to 50 3. 50 to 100 4. 100 to 1000 5. more than 1000	mean = 2.5 σ = 0.9
8. Would you want the document service to transcribe specialist braille codes such as music, mathematics and computing? If so, which ones?	Music Mathematics Computing	6 1 1

