FORMATTING CHECKER TOOL FOR BLIND WORD-PROCESSOR USERS

PROTOTYPE FORMATTING CHECKER ADD-IN FOR MICROSOFT OFFICE WORD 2007

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MOTIVATION AND GOALS

- Layout and formatting errors are the most common types of errors in documents produced by blind people.
- Checking a document's formatting and layout attributes with screen readers and word processors is inefficient.
- Main Goal: Design an Add-in for Microsoft (MS) Office Word to assist blind people in the independent creation and editing of documents.

BACKGROUND

Word processed documents produced by blind people commonly contain two broad classes of errors:

Formatting Errors:

- Incorrect or inconsistent
    - capitalized text
    - use of bold, italic, underline, etc.
    - application of font size and choice of font type
    - spacing between adjacent words

Layout Errors:

- Incorrect or inconsistent
    - alignment of paragraphs
    - positioning of text with regards to its indentation or tab position
    - spacing between adjacent blocks of text
- Broken text errors: when a cohesive set of lines (e.g., address, table, etc.) breaks across a page, column, or other boundary

METHODS

- Design a prototype Add-in for MS Office Word 2007 to help blind people detect and correct formatting errors.
- Design a user study to evaluate and test the prototype.

MICROSOFT OFFICE WORD 2007 FORMATTING CHECKER ADD-IN

- *Add-in*: Application-level customization that becomes part of MS Office Word's User Interface
    - Functionality is not restricted to any single document like Macros.
- MS Add-in design guided by prior research into formatting and layout errors produced by blind word-processor users.
- Functions are designed to be easily accessible through simple shortcut keys (see **Table 1** and **User Interface: Accessing Add-in Functions** section).
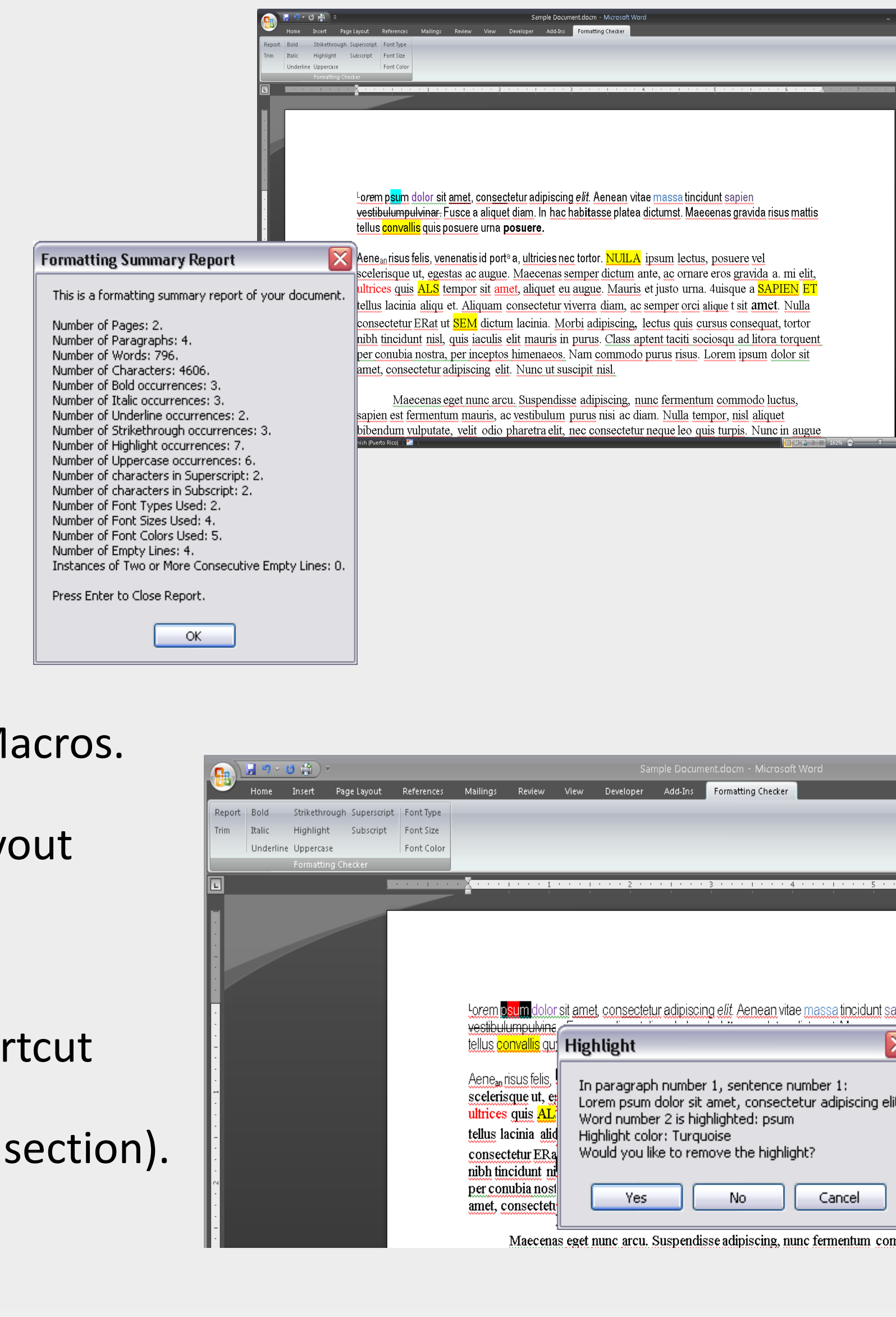- Displays textual feedback easily read by a screen reader.

Table 1. Formatting Checker MS Add-In Functions

Name	Keys	Function
Report	R, E, P	Launches report with a summary of the document's formatting and removes excessive spacing between words.
Trim	T, R, I	Removes excessive spacing between words.
Bold	B, O, L	Checks for formatted punctuation marks, characters and words (with some or all of its characters formatted); one by one it specifies where they are and offers to remove the formatting. For words, if you choose to leave it formatted or to cancel the search, the word in focus will be completely formatted in case it wasn't before.
Italic	I, T, A	
Underline	U, N, D	
Strikethrough	S, T, R	
Highlight	H, I, G	
Uppercase	U, P, P	Checks for characters and words (with all or at least three of its characters) in uppercase; one by one it specifies where they are and offers to set them to lowercase or to Sentence case when it is the start of a sentence. For words, if you choose to leave it in uppercase or to cancel the search, the word in focus will be completely set to uppercase in case it wasn't before.
Superscript	S, U, P	Checks for characters in the special script; one by one it specifies where they are and offers to set them to normal script.
Subscript	S, U, B	
Font Type	F, T, Y	Determines the different font types, sizes or colors used throughout the document and displays them as a list. If more than one font type, size or color is used, it offers to search for how and where in the document the font property changed.
Font Size	F, S, I	
Font Color	F, C, O	

USER INTERFACE

ACCESSING ADD-IN FUNCTIONS

1. Press **alt**:

2. Focus on the Add-in (press **C** followed by **F**)

3. Select function (press the function's three key sequence)

USER STUDY DESIGN

Study Goals:

- Test the Add-in's functionality
- Evaluate the user interface

Participants are asked to:

- Read the manual to learn what the Add-in does and how to use it.
- Familiarize themselves with the Add-in by using it to inspect one of their word-processed documents.
- Use the Add-in to correct a one page long document (provided by us), that contains common formatting errors.
- Take a survey on user interface satisfaction[3].

[3]The questions on user interface satisfaction were taken from the QUIS (Questionnaire for User Interface Satisfaction) one of the standard user interface evaluation questionnaire forms.

FUTURE WORK

- Conduct the user study with blind word-processor users.
- Improve the Add-in with the feedback from the study.
- Design another MS Office Word 2007 Add-in that checks the layout of the text in a document and helps the user choose or design a formatting style for their document.
- Make both Add-ins compatible with MS Office Word 2010.

REFERENCES
D. Gareth Evans, Tim Diggle, Sri H. Kurniawan, and Paul Blenkhorn. "*An Investigation Into Formatting and Layout Errors Produced by Blind Word-Processor Users and an Evaluation of Prototype Error Prevention and Correction Techniques.*" *IEEE Trans. Neural Syst. Rehab. Eng.,* vol. 11(3), pp. 257–268, Sept. 2003.