

WebPage Transclusion – An Adaptive Algorithm for Web Technologies

Vishwas J Raval, Amit R Thakkar, Amit P Ganatra and Yogeshwar P Kosta, *Member, IEEE*

Abstract— As every thing in terms of services or an activity, be it of economic interest or otherwise collapses on the www – for want of data or info, filing an income tax return, submitting an application or even working as a part of a virtual team/company, it is become important, keeping in view of the diversity of users – from educated to the uneducated- methods and mechanisms be discovered/evolved to make the www a better and habitat place providing a conducive environ – in plain words: human user friendly and welcoming - while browsing or laboring for the same as our society transcend into the next century of virtual world and reality. The present scenario – during extraction of data or info, in a www environment, when a user wants to include some text or image from another website for reference “Tansclusion” is used. Transclusion is the inclusion/incorporation of part of a document into another document through instantaneous reference. Consider for example, an article about a country might include a chart or a paragraph describing that country’s agricultural exports from a different referenced article about agriculture (pointer), rather than copying the included data and storing it in two places. A transclusion embodies modular design, by allowing it to be stored only once (and perhaps corrected and updated if the link type supports the same) and viewed in different contexts. The reference also serves to link both articles. However, this has several limitations which have been addressed by our research and we proposed a new technology “WebPage Transclusion” to include web pages that help to eliminate the above limitations.

Index Terms— HTML, DHTML, Frame, Hyperlinks, Form, Transclusion, Browser, Frame-Bust, Frame-Bust Protection, IFrame

I. INTRODUCTION TO TRANSCLUSSION

Nelson was the first to coin the words "hypertext" and "hypermedia" including "transclusion" in his book, Literary Machines, 1982. Part of his proposal was the ideas that micropayments could be automatically extracted from the reader for all the text, no matter how many snippets of content are taken from various places [1]. Figure-1 illustrates Transclusion.

Vishwas J Raval, Lecturer, CE-IT Dept. CITC (email: vishwas.raval@gmail.com)

Amit R Thakkar, Asst. Professor, CE-IT, CITC (email: amitthakkar.it@ecchanga.ac.in)

Amit P Ganatra, Professor & Head, CE-IT, CITC (email: amitganu@yahoo.com)

Yogeshwar P Kosta, Principal, CITC (email: ypkosta@yahoo.com)

Charotar University of Science Technology (CHARUSAT), Education Campus, Changa – 388421, Ta – Petlad, Dist – Anand, Gujarat (INDIA)

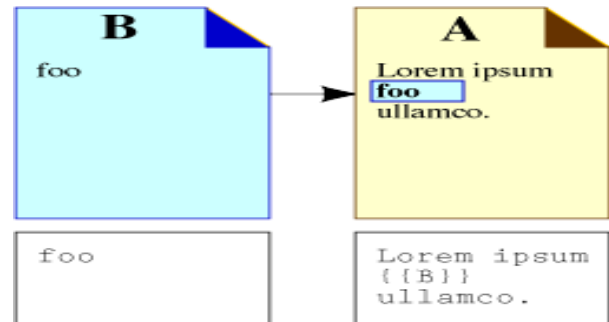


Figure 1. (Source: <http://en.wikipedia.org/wiki/Transclusion>)

However, according to Nelson, the concept of transclusion had already formed part of his 1965 description of hypertext; he also interprets the notion of "trails" in Vannevar Bush's 1945 essay *As We May Think* as describing transclusion rather than hyperlinks. He defines transclusion as "the same content knowably in more than one place", setting it apart from more special cases such as the inclusion of content stored in a different location (which he calls "transdelivery") or "explicit quotation which remains connected to its origins" (which he calls "transquotation"). See Figure-2. Some hypertext systems, including Ted Nelson's own Xanadu Project, support transclusion.

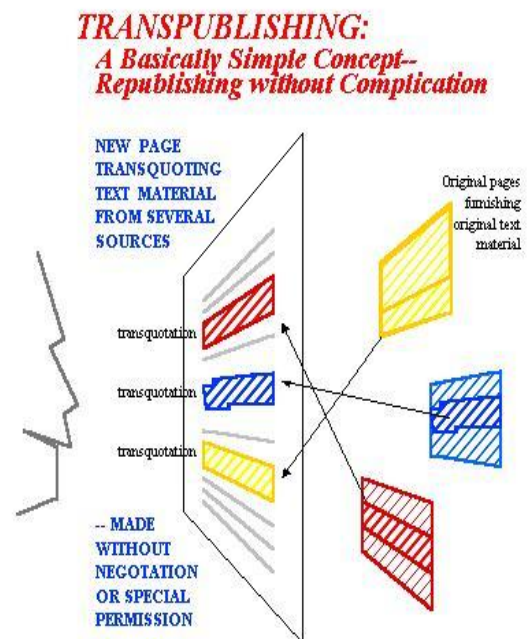


Figure 2. (Source: <http://www.futureofthebook.org/blog/archives/pic-tpubOverpicD17z.JPG>)

Nelson has delivered a demonstration of Web transclusion, the Little Transquoter (programmed to Nelson's specification by Andrew Pam in 2004-2005). It creates a new format built on portion addresses from Web pages; when dereferenced, each portion on the resulting page remains click-connected to its original context—always a key aspect of transclusion for Nelson, but missing in most implementations of transclusion.

II. PROBLEMS ASSOCIATED WITH TRANSLUSION

At present, transclusion in HTML is somewhat limited by lack of standards support in web browsers. Although all graphical browsers can transclude an image, including a document is a bit more difficult. There are currently two methods of achieving this result:

- The IFrame (inline frame) element that includes whole document/s.
- The Object element, in Firefox and other browsers, permits true document transclusion, enabling one page to be built from several smaller documents.

These two methods mentioned are limited to small images or text only and if one wants to include the whole web-page/s as a part of any other web page, then the same can be achieved through hyperlinks in HTML. See figure 3. [2][3][4][5][6][7].

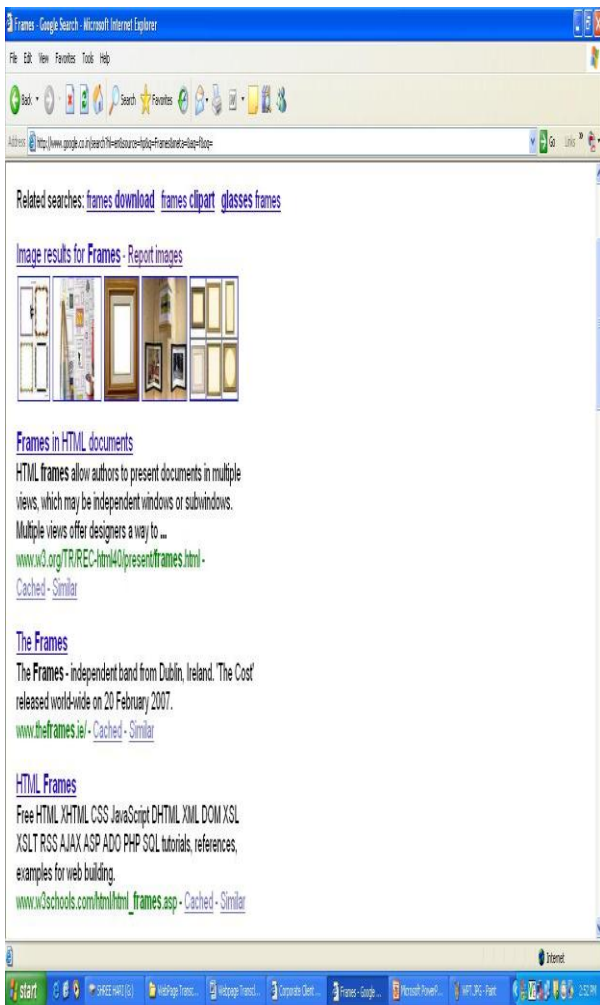


Figure 3. Google Search Engine with resulting hyperlinks

However, in the case of hyperlinks, when one wants to refer to a particular page, user needs to open that page in a separate window/tab. In case the user opens it in the current operating page-window then the operating page-window gets masked by the particular (referred) page-window and thus the user loses the navigation controls embedded/contained in the window/frame during browsing ultimately paralyzing the browsing process, midway resulting in loss of link (break) and information and difficulty to navigate back to the original start point. This scenario has been demonstrated in figure 4.



Figure 4. User opened First link and the referring window gets masked

III. WEBPAGE TRANSLUSION TECHNOLOGY

WebPage Transclusion is the technology to include whole web pages across www for references or use. In this paper, our team report the experimental development of an adaptive algorithm called: “*The WebPage Transclusion Algorithm*” that is sufficiently robust and experimentally verified to take care of the problems faced during web browsing discussed

above. This algorithm works behind the screen like a daemon while the user browses through www pages in the internet.

IV. THE WEBPAGE TRANSLUSION ALGORITHM

The following steps are conceptual to the design of the *WebPage Translusion Algorithm*:

- 1) Create a web page using frame¹, here we divide the window into two parts viz: Navigational control and Content frame. Figure-5 shows the left/top of the window to work as Navigation Frame and right/bottom part as Content Frame - when user starts browsing.



Figure 5. A Framed browser window

- 2) Scan the web pages that user browses through, opening it into the content frame by setting target of the web page being browsed equals to name of content frame (pointer).
- 3) If web page contains hyperlinks extract those links and add it into the navigation frame as a subset of link which has been added in step-2.
- 4) If web page contains <form> tag, then the Call command for Frame-Bust Protective Algorithm is invoked in order to prevent Frame-Busting. [8]
- 5) Repeat steps 2 to 4 till browser's instance is destroyed.
- 6) Exit.

Figure 6 shows the WebPage Translusion Process.

¹ Framing is the concept of dividing the window of a given webpage into several sections and sub-sections thereafter (in a predetermined manner/sequence), basically for the purpose of ease of accessibility of multiple information efficiently without loss of continuity and sequencing during information search or retrieval. Each section contains a separate frame (smaller than the mother frame) which displays a different HTML document/information. While, the headers and sidebar menus remain static and visible through out the process. The accessing of information or document (by surfing within) especially when the information content frame is larger and scrolling is necessary. [9]

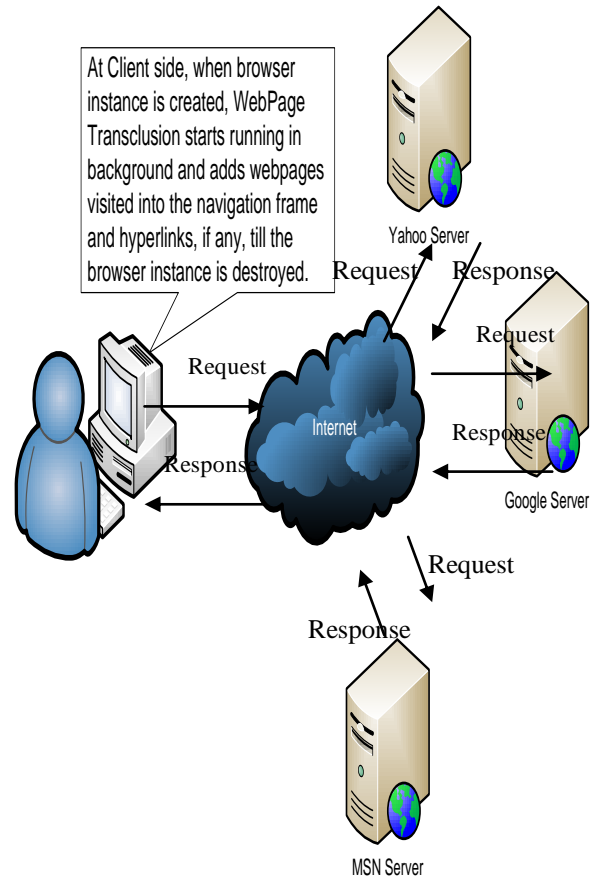


Figure 6. WebPage Translusion Process

A. Advantages

- 1) As the pages would be opened into the content frame, users would never loose navigation.
- 2) Users would be able to access all the desired websites using a single browser window, he/she would not be required to open a new tab even.
- 3) In case of Frame-Busing, with The Frame Bust Protection Algorithm user would feel transparency during the web browsing. [8]

B. Disadvantages

- 1) However, implementation point of view, it would be difficult to traverse all the pages which are received in response from various web servers and retrieve the links and add it to the navigation frame. For this some efficient algorithm would be required.
- 2) If Frame-Bust Protection is used to copy contents for Bust-Protection would result in violation of copyrights for which prior permission would be required [6][8]

V. FUTURE WORK

The algorithm is still under implementation phase. We are implementing it in JAVA so that there would not be any issue of platform independency & licensing.

ACKNOWLEDGMENT

We are thankful to The Omnipotent GOD for making us

able to do something. We express our gratitude to the management of CHARUSAT; Shri Charotar MotiSattavis Kelavani Mandal, for providing us research opportunities and their wholehearted support for such activities. Finally, our acknowledgement can not end without thanking to the authors whose research papers helped us in making this research.

REFERENCES

- [1] Nelson, T. H. (1981). *Literary Machines*. Mindful Press.
- [2] Kolbitsch, J.; Maurer, H. (June 2006). "Transclusions in an HTML-Based Environment". *Journal of Computing and Information Technology* 14 (2): 161-174. doi:10.2498/cit.2006.02.07. <http://cit.zesoi.fer.hr/browseIssue.php?issue=25>
- [3] Kolbitsch, J. (June 2005). "Fine-Grained Transclusions of Multimedia Documents in HTML". *Journal of Universal Computer Science* 11 (6). http://www.jucs.org/jucs_11_6/fine_grained_transclusions_of/
- [4] Krottmaier, H.; Helic, D. (2002). "Issues of Transclusions" (PDF). *Proceedings of the World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education (E-Learn 2002)*: 1730-1733.
- [5] Krottmaier, H.; Maurer, H. (July 2001). "Transclusions in the 21st Century" (PDF, HTML, PostScript). *Journal of Universal Computer Science* 7 (12): 1125-1136. http://www.jucs.org/jucs_7_12/transclusions_in_the_21st/.
- [6] Nelson, T. H. (1998). "Transcopyright: Pre-Permission for Virtual Republishing".
- [7] Pam, A. (1997). "Fine-Grained Transclusion in the Hypertext Markup Language" (Text). Internet Draft.
- [8] Raval, Vishwas J (et. al.) ; "Frame-Bust Problem & Bust-Protective Algorithm". *International Conference on Software Technology & Engineering-2009*. World Scientific (ISBN: 978-981-4289-97-9(pbk) July-2009 Pg: 8-11)
- [9] *Special Edition Using HTML 4.0*, MacMillan Computer Publishing