















implementation of the systems in this paper. The experiments showed that stickies can be placed on the page very quickly, and the system can synchronize a displayed content within a given length of time without the number of the devices that are used in the experiment.

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### References

- [1] Z. Chen, L. Wenyin, F. Zhang, M. Li, and H. Zhang. Web mining for web image retrieval. *Journal of the American Society for Information Science and Technology*, 52:831–839, 2001.
- [2] K. Cheng, J. Li, and C. Muller-Tomfelde. Supporting interaction and collaboration on large displays using tablet devices. In *Proceedings of the International Working Conference on Advanced Visual Interfaces, AVI '12*, pages 774–775, New York, NY, USA, 2012. ACM.
- [3] P. A. Chirita, S. Costache, W. Nejdl, and S. Handschuh. P-tag: large scale automatic generation of personalized annotation tags for the web. In *WWW '07: Proceedings of the 16th international conference on World Wide Web*, pages 845–854. ACM Press, 2007.
- [4] R. Farzan and P. Brusilovsky. Annotated: A social navigation and annotation service for web-based educational resources. *New Rev. Hypermedia Multimedia*, 14(1):3–32, 2008.
- [5] Y. Fukagaya, T. Ozono, T. Ito, and T. Shintani. Mispider: a continuous agent on web pages. In *WWW '05: Special interest tracks and posters of the 14th international conference on World Wide Web*, pages 1008–1009. ACM Press, 2005.
- [6] D. Giordano and S. Mineo. A graphical annotation platform for web-based e-learning. In *In proc. of Multimedia and Information and Communication Technologies in Education*, pages 1255–1260, 2005.
- [7] E. J. Glover, K. Tsioutsouluklis, S. Lawrence, D. M. Pennock, and G. W. Flake. Using web structure for classifying and describing web pages. In *WWW '02: Proceedings of the 11th international conference on World Wide Web*, pages 562–569. ACM Press, 2002.
- [8] J. Kahan and M.-R. Koivunen. Annotea: an open rdf infrastructure for shared web annotations. In *WWW '01: Proceedings of the 10th international conference on World Wide Web*, pages 623–632. ACM Press, 2001.
- [9] M.-R. Koivunen. Annotea and semantic web supported collaboration. Invited talk at *Workshop on User Aspects of the Semantic Web (User-SWeb) at European Semantic Web Conference*, 2005.
- [10] C.-C. Liu and L.-C. Kao. Handheld devices with large shared display groupware: Tools to facilitate group communication in one-to-one collaborative learning activities. In *Proceedings of the IEEE International Workshop on Wireless and Mobile Technologies in Education, WMTE '05*, pages 128–135, Washington, DC, USA, 2005. IEEE Computer Society.
- [11] S. Sakamoto, H. Kita, H. Takase, and T. Hayashi. Platform for web services using proxy server. *The Special Interest Group Notes of IPSJ*, 2002(31):7–12, 2002.
- [12] M. Tanabe, T. Ozono, T. Itoh, and T. Shintani. Web servise addition system by bookmarklet using user browsing domain. In *Proceedings of the 68th National Convention of IPSJ*, 2006.
- [13] J. Tennis. Social tagging and the next steps for indexing. In *Proceedings of the 17th SIG/CR Classification Research Workshop*, 2006.
- [14] Y. Yang and S. A. Slattery. A study of approaches to hypertext categorization. *Journal of Intelligent Information Systems*, 18:219–241, 2002.

<sup>4</sup> <http://www.hori-foundation.or.jp/english/>