

Hippie: A Nomadic Information System

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1. Introduction

Hippie [1] is an internet-based guide offering added value to current information facilities by supporting the multiplicity of activities during the preparation, the execution and the evaluation of a museum/fair visit¹. The process orientation is made possible by the nomadic characteristic [2] of the system that allows the user to have access to his or her personal information space from all places independently from specific devices. The context takes into account the current location and direction of the user, his personal characteristics like knowledge and interests and the environmental conditions like physical arrangements and technical tools.

Before a visit a user can browse all exhibits, prepare tours, and mark individual hotspots. The information selected and presented is adapted to the interests, the knowledge and the presentation preferences of the user [3]. During the actual visit augmented reality components for artwork interpretation and mainly audio output complement the visual modality preoccupied by the physical environment. Furthermore position tracking and location systems in the exhibition place allow for the adaptation of hippie to the current visitor position (at home or in front of a certain exhibit). The system automatically identifies the relevant objects close to the visitor and multi-modal information presentation takes into account the specific environmental constraints for information perception in the physical context.

Two main elements for the process orientation of the system, the internet-based personal information space and the learning capability of the system of the evolving knowledge and interest of the visitor, are described below in some more detail.

2. Nomadic Information Systems for Individualized Process Support

Internet connectivity provides access to the information basis from all over the world. At home the user can access the system with a desktop computer with high-resolution presentations to study the site of interest and can prepare an actual visit. The visit in the exhibition is supported by a handheld/wearable computer (PDA) with wireless LAN connection. Being in the museum the user can move around and explore the environment with exhibits of particular interest for him or her. The system identifies the current position of the visitor and updates the appropriate information proposal for the visitor who can select the proposed information presentation or proceed to another interesting exhibit where information about the exhibit is welcome. The visitors access the same information space they are already familiar with from sessions at home including own annotations and hotspots or with a tour including exhibits of a particular importance for these visitors.

3. Information Adaptation to User's Knowledge and Interests

The adaptive component runs a user model describing the knowledge and the interests of the user. The user model automatically evaluates the user's interaction with the system in the information space and the user's physical navigation in the museum. The adaptation to the assumed pre-knowledge is performed by avoiding redundancy and by referring to earlier presentations. The adaptation to the assumed interests of the user is provided by adaptive tours and adaptive content recommendations. If a user has selected a number of objects (exhibits) the user model identifies common attributes of the selection in terms of, e.g., artist, style or genre. In case of exceeding a

¹ The prototype Hippie was developed by GMD in the context of the project "Hyperinteraction within Physical spaces" (HIPS), an EU-supported LTR project in ESPRIT I³. The partners of the consortium are University of Siena (co-ordinating partner), University of Edinburgh, University College Dublin, ITC, SINTEF and GMD, CB&J, and Alcatel.

rule-defined threshold for a significant interest of the visitor in this kind of artworks the system initiates a “Tip” with a user specific tour containing relevant additional artworks [4]. The same rule-based mechanism is applied for the presentation of contents about the artworks.



Fig 1: Notification of an adaptive tour proposal

4. Summary

Contextualised information presentation takes into account more than just the user’s location [5]. A contextualised information space is defined by an information repository adapted to the location, the characteristics of the user like knowledge, interest or interaction or presentation preferences. The prototype presented in this paper supports the process of art perception at three steps, the preparation of a museum visit, the execution of the visit itself and the evaluation of the visit. The system adapts the information presentation to the evolving knowledge and interest of the visitor to enrich the benefit and the visit in terms of knowledge and enjoyment.

5. References

1. Oppermann, R. and M. Specht. *A nomadic Information System for Adaptive Exhibition Guidance*. in *ICHIM99, International Cultural Heritage Meeting*. 1999. Washington, D.C.:
2. Kleinrock, L., *Nomadcity: Anytime, Anywhere*. Mobile Networks and Applications, (1997). 1(4): p. 351-357.
3. Brusilovsky, P., *Efficient Techniques of adaptive hypermedia*, in *intelligent Hypertext*, C. Nicholas and J. Mayfield, Editor. (1997), Springer: Berlin, Heidelberg, New York. p. 12-27.
4. Oppermann, R., *Adaptively supported Adaptability*. International Journal of Human-Computer Studies, (1994). 40: p. 544 - 472.
5. Abowd, G.D., Dey, A. K., Abowd, G., Orr, R., and Brotherton, J. *Context-awareness in wearable and ubiquitous computing*. in *1st International Symposium on Wearable Computers*. 1997. October 13-14: