

IDEA GROUP PUBLISHING 701 E. Chocolate Avenue, Suite 200, Hershey PA 17033-1240, USA Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com

This paper appears in the publication, *Collaborative Geographic Information Systems* edited by Shivanand Balram and Suzana Dragicevic © 2006, Idea Group Inc.

Chapter II

Usability Dimensions in Collaborative GIS

Mordechai (Muki) Haklay, University College London, UK

Abstract

Collaborative GIS requires careful consideration of the Human-Computer Interaction (HCI) and Usability aspects, given the variety of users that are expected to use these systems, and the need to ensure that users will find the system effective, efficient, and enjoyable. The chapter explains the link between collaborative GIS and usability engineering/HCI studies. The integration of usability considerations into collaborative GIS is demonstrated in two case studies of Web-based GIS implementation. In the first, the process of digitising an area on Web-based GIS is improved to enhance the user's experience, and to allow interaction over narrowband Internet connections. In the second, server-side rendering of 3D scenes allows users who are not equipped with powerful computers to request sophisticated visualisation without the need to download complex software. The chapter concludes by emphasising the need to understand the users' context and conditions within any collaborative GIS project.

Copyright © 2006, Idea Group Inc. Copying or distributing in print or electronic forms without written permission of Idea Group Inc. is prohibited.

Introduction

The design and implementation of successful collaborative GIS (C-GIS) is a multidimensional challenge. As Armstrong (1994) identified, the crux of this challenge lies in the semistructured nature of the problems that C-GIS is intended to solve. In such situations, only parts of each problem can be defined using formal methods of analysis that are easy to implement with a GIS. However, most of the problem components do not succumb easily to formalism, and an agreed solution can only be reached through discussion and interpretation by the stakeholders. Worse still, in many cases these are "wicked problems" (Rittel & Webber, 1984) where the stakeholders do not agree on the definition of the problem, and the problem itself mutates during the problem-solving process, as a result of the effort itself.

These inherent challenges are well recognised in the literature on the applications of GIS for group problem solving. This literature is inextricably linked to the wider research on Computer Supported Cooperative Work (CSCW) and groupware, which originated in the field of computer science circa 1984 (Grudin, 1994). For many researchers of CSCW and C-GIS, the complexity of group problem solving makes the research and development of such systems more interesting.

One might expect that, on the basis of almost two decades of research, a developer of C-GIS today would have a relatively easy task in assembling an effective system: the extensive literature and much practical experience should have provided clear instructions. After all, many of the tools that were introduced in CSCW research are now available as standard within everyday software, to the extent that the latest version of the ubiquitous Microsoft Office is now promoted as a system that enables group collaboration: "…Office 2003 Editions have improved in four areas: information management and control, business processes, *communication and collaboration*, and personal productivity" (Microsoft, 2004, emphasis added).

However, while the latest versions of commercial GIS packages offer some support for group collaboration, and reliable systems for sharing spatial databases and geo-processing amongst groups are being deployed successfully, these GIS packages do not include groupware capabilities. Therefore, there remains a need for research on end-users' interaction with C-GIS, and for development of easy and effective methods, techniques, and tools to allow the implementation of C-GIS applications. The gap between GIS and other software systems can be attributed to the complexities of geographical information sharing. Only in the mid-1990s did GIS technology reach a level of maturity that allowed the development of information sharing within organisations, in what is termed "enterprise GIS." Enterprise GIS products focus mainly on the storage 17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart"

button on the publisher's webpage: www.igi-

global.com/chapter/usability-dimensions-collaborative-

gis/6650

Related Content

Optimization of Concrete-Filled Steel Tubular (CFST) Columns Using Meta-Heuristic Algorithms

Celal Cakiroglu, Kamrul Islamand Gebrail Bekda (2021). *International Journal of Digital Innovation in the Built Environment (pp. 63-74).*

www.irma-international.org/article/optimization-of-concrete-filled-steel-tubular-cfst-columnsusing-meta-heuristic-algorithms/283117

Privacy-Preserving Spatial Trajectory Prediction Based on a Novel Matrix Representation

Wen-Chen Hu, Naima Kaabouch, Hung-Jen Yangand S. Hossein Mousavinezhad (2016). *Geospatial Research: Concepts, Methodologies, Tools, and Applications (pp. 1693-1717).*

www.irma-international.org/chapter/privacy-preserving-spatial-trajectory-prediction-based-on-anovel-matrix-representation/149571

Modeling Subalpine and Upper Montane Forest-Climate Interactions in Colorado: A Comparative Study Using GIS

Steven Jenningsand Eric Billmeyer (2014). *International Journal of Applied Geospatial Research (pp. 21-34).*

www.irma-international.org/article/modeling-subalpine-and-upper-montane-forest-climateinteractions-in-colorado/119615

Modelling the Spatial Distribution of the Anopheles Mosquito for Malaria Risk Zoning Using Remote Sensing and GIS: A Case Study in the Zambezi Basin, Zimbabwe

Francis Danquah Ohemengand Falguni Mukherjee (2015). *International Journal of Applied Geospatial Research (pp. 7-20).*

www.irma-international.org/article/modelling-the-spatial-distribution-of-the-anopheles-mosquitofor-malaria-risk-zoning-using-remote-sensing-and-gis/122801

Geospatial Analysis for Real Estate Valuation Models

Susan Wachter, Michelle M. Thompsonand Kevin C. Gillen (2005). *Geographic Information Systems in Business (pp. 278-300).* www.irma-international.org/chapter/geospatial-analysis-real-estate-valuation/18872