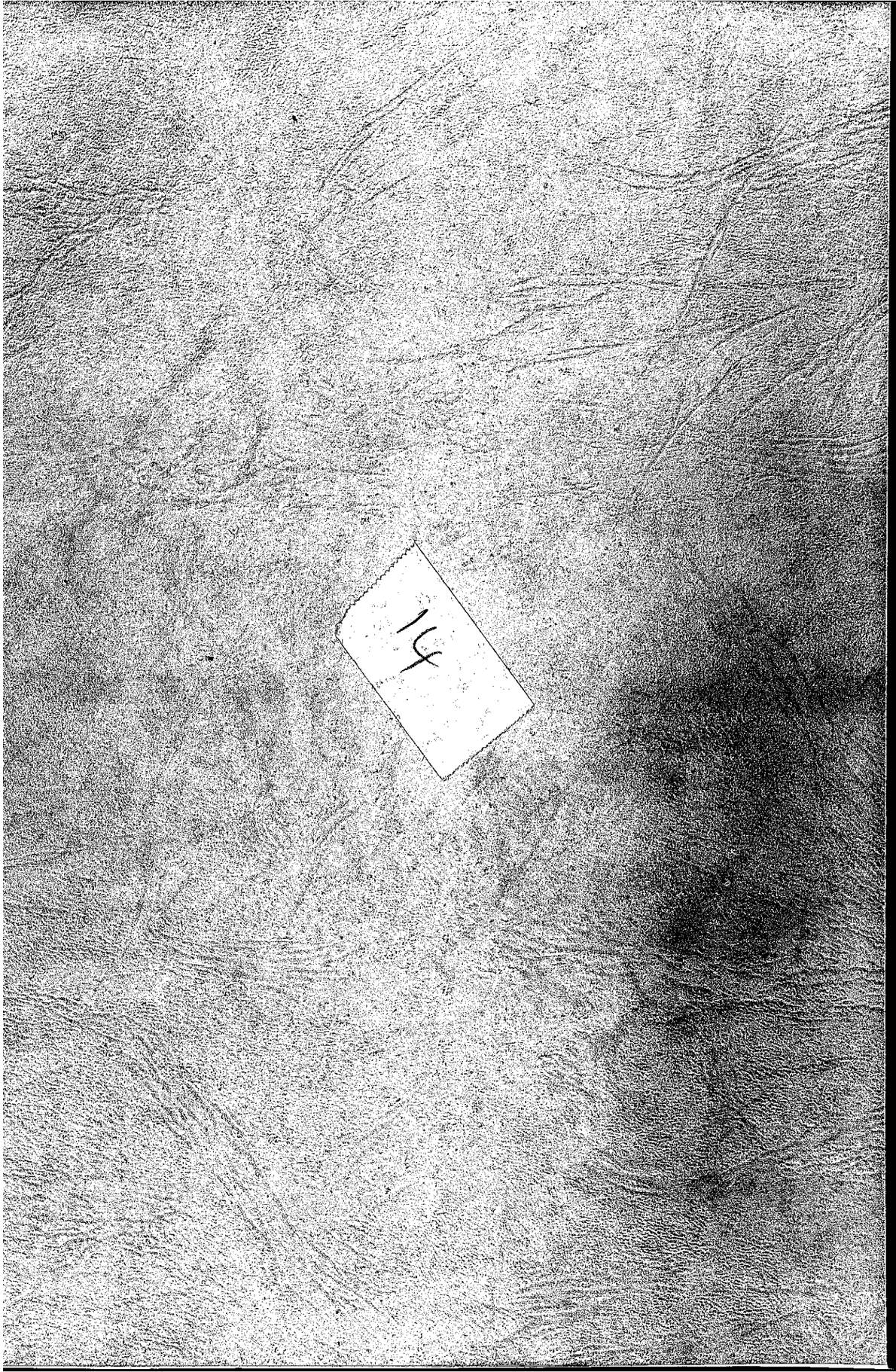
AGILE
Association
of Geographic
Information
Laboratories
in Europe

University
of Rome
"La Sapienza"

Rome,
April 15-17,
1999

2nd AGILE CONFERENCE ON GEOGRAPHIC INFORMATION SCIENCE



Programme

Thursday 15 April 1999

Winter S., Technical University of Vienna, Austria.
● Topological Analysis with Approximate Location. ►42

16.45 **Poster Session starts and ends on Saturday**

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● The Venice Lagoon Experimental GIS at the IUAV. ►44

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● Geomist - Geological and Mining Information System. ►46

Šliuzas R. & Amer S., ITC, The Netherlands.
● The promise and practice of using GIS for public planning in Dar es Salaam, Tanzania. ►47

Mucsi L., University of Szeged, Hungary.
● Analysing the effects of agrarian compensation in Hungary using GIS methods. ►48

Biagioni S., Carlesi C., Fortunati L., Salvetti O., Italian National Research Council, Italy.
● A Geo-Data Server for the South-Pole Information System. ►49

Ferrara A., Gargano O., Patteri P., ISTAT, Italy.
● The Geo-reference of Public Services. Applications to Urban Area of Rome. ►51

Pedroso T., Rocha J., Almeida J. J., University of Minho, Portugal.
● MAPit! - A tool set for automatically generation of HTML Maps. ►52

Markov N. G., Ostrast P. M., Tomsk Polytechnic University, Russia.
● Distributed Web-based GIS. ►53

Cremona G. & Valpreda E., ENEA, Italy.
● Spatial erosion quantitative assessment inside the appennennic mountain region: the Brasimone river in the northern Italy. ►54

Neves G. S. de O., University of Sevilla, Spain.
● An optimal zoning approach to the study of spatially aggregated administrative data. ►55

20.30 **Conference dinner** at Palazzo Colonna, Princess Isabelle's Apartment. Rome, Piazza SS. Apostoli, 66.

Friday 16 April 1999

09.00-10.30 Regular session 2, **Integration of Spatial and Administrative Databases.**
Chair: Prof. Anders Ostman, Luleå University, Sweden.

Esposito M. A., Maffulli S., University of Firenze, Italy.
● Increased information's value in spatial databases for cultural heritage. ►57

Accardo G., ICR & Salvemini M., University of Rome, Italy.
● Spatial temporal definition of cultural heritage and of geographic entities in the Risk Map project. ►59

Stridsman F. & Segerlund M., Luleå University of Technology, Sweden.
● A Tool for Generating Integrated Systems. ►65

García-Consuegra J., Peralta J., Martínez A., Castilla-La Mancha University, Spain.
● VisorMap CS: a GIS Client/Server Application. ►72

11.00-12.30 Regular session 3, **Spatial Aspects of Socio-Economic or Environmental Modelling.**
Chair: Dr. Alessandro Annoni, European Commission, Joint Research Centre.

Benenson I., Omer I., Portugali J., Tel-Aviv University, Israel.
● Agent-Based Simulation of Urban Residential Dynamics in Tel-Aviv. ►78

Haining R., Craglia M., Signoretta P., University of Sheffield, UK.
● Modelling the Geography of High Crime Areas in UK Cities: a GIS Based Analysis. ►82

Bøcher P. K., Jensen T., Olesen J. E., Danish Institute of Agricultural Sciences.
● Using GIS for Upscaling Simulated Crop Production in Denmark. ►85

Raimondi L., Secondini P., Tondelli S., University of Bologna, Italy.
● Urban mobility, air quality and GIS: integration experiences in the Bologna province. ►89

12.30 **Lunch at the congress centre.**

14.00-15.00 Regular session 4, **Emerging Technologies.**
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● Providing Public Access to a Digital City. ►94

Clausi C., Autodesk, Italy.
● "Breaking traditional barriers in GIS": Network-Centric GIS. ►95

Attura G., ESRI Italia.
● Distributed GIS in ICT Environments. ►102

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● Cartography on the Internet. The cartographic website Regione Emilia Romagna. ►103

15.30-17.00 Regular session 5, **GI Infrastructures.**
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● From Mars Project to a Catchment Based Information System. ►107

Marcus B., FÖMI, Hungary.
● Building Web-based Land Information Services in Hungary. ►108

Mielby S. & Platou S. W., NERI, Denmark.
● AIS - A Framework for handling Spatial Environmental Data at National Scale. ►112

Kok B., Berends J., Ravi, The Netherlands.
● The Ravi Action Programme Knowledge Infrastructure: Objectives, Developments and Further Cooperation in the Future. ►120

17.30-18.45 **Short paper session**
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Agranovich B. & Markov N., Tomsk Polytechnic University, Russia.
● GIS for Monitoring of Socio-Economical and Ecological Fields of Region. ►121

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● LITOSIT: To build up a GIS for Environment with the People. ►123

Berardi L., University of Rome, Italy.
● GIS as an arrangement-management plan and system for environmental resources of the Natural Parks in the Region Lazio. ►125

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● Monitoring user responses to web-based GI interfaces. ►127

Giuffrida G., University of California, USA; Salvemini M., University of Rome.
● Loosening the Connection between Syntax and Semantics for Spatial Data. ►129

Painho M. & Sena R., New University of Lisbon, Portugal.
● Environmental Impact Assessment Evaluation: An Interface for Decision Support. ►133

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Ferrara A., ISTAT, Italy.
● The GeoServe Project. ►141

Abad F., Garcia-Consuegra J., Castilla-La Mancha University & Lluch J., Valencia University of Technology, Spain.
● Application for 3D Interactive Gevimetric Modelling. ►142

Kidane F. Y., Ethiopia.
● GIS Science & Technology and Land Related Planning in Developing Countries: A Need for New Research Initiatives. ►147

19.00 **Evening discussion groups on topics yet to be decided**

20.00 **Dinner at the congress centre**

Saturday 17 April 1999

09.00-10.30 Regular session 6, **GIS for Public Planning.**
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● Environmental Information System for the Environmental Regional Directorate of Alentejo-Évora (Portugal). ►148

Secondini P., Grande G., Virgilio G., University of Bologna, Italy.
● Development of an Explorative Analysis for Public Choices with the Aid of a GIS: The Rimini's Metropolitan Areas Housing Market Case Study. A demand side analysis. ►156

Salvemini M., University of Rome "La Sapienza", Italy.
● Will GIS affect the public planning in European countries during the near future? Some considerations for a proposal of research and action. ►163

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● Formal Methods for GI Systems Development. ►168

11.00-13.00 **AGILE business meeting**

The report from the chairman.

The reports from the secretary and the treasurer.

Future AGILE activities.

- A double spatial dimension comes out of the data collected from census sections. A vertical one wich represents the numbers of floors in a dwelling building and a horizontal one wich comes out of the between the number of dwellings and infrastructure in the section.

ve results you must take into account those factors and limitations in the approach we used as balance in the process of scale changing the average he heterogeneity of the space in this matter did not allow us to get good quality ate census data until the minimum unit of group compatible with our scale o the spatial level we need and compare the different dates. The basic unit was the r than a block and it is the minimum census scale available in numeric. In this scale and the number of floors so that we could have a good estimation of the dwelling e, in one way the population density at minimum spatial level and in another way the census the population, it is easy, thanks to G.I.S. to organise the census regarding the plot d to regroup it according to homogeneous morphologic units from the analysis of satelite is way we obtain a caartography of the town where the characteristics of the soil use are related t ulation and this offers the possibility of diachronic analysis of census and space data.

Increased information value in a spatial database for cultural heritage

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Keywords

GIS and Cultural Heritage, Historical Asset Management, HISTOCITY method.

Abstract

European cities are to be considered mostly as "historical cities," given the high density of monuments present in the territory. Managing such cities is a complex task, since historical cities are also monuments in themselves, they are cultural patrimony.
Increasing the quantity and quality of information about the cultural heritage will help in making more effective decisions regarding the organisation of modern life in the historical cities and to confront them to the challenge of globalisation against rising decline.
There are numerous general texts, books and research about monuments, but very little raw data suitable for geographical analysis. This is especially true in Italy, where the official filing system of the central authority for restoration is still on paper and there are no explicit geographical references included. The aim of the project presented in the paper is to supply a way to override this limitation by giving a general method of integrating the data about cultural asset in a urban environment in a GIS environment.
The DBMS designed in this work has been developed starting from the catalogation methods used in Italy by the "Istituto Centrale per il Catalogo e la Documentazione", which are derived from the general methods proposed by UNESCO (Warsaw Nairobi, 1976) and particularly by ICOMOS (Venice 1964, 1987) for cataloguing cultural patrimony.
The first step has been to identify as "entities" with significance in the conceptual model the different basic types of monument: buildings, gardens, archeological sites and, finally, complexes, which are the aggregation of the other kind of monuments and are used when the concept of cultural patrimony applies to the whole group other than to the single elements. All of these entities have their own special attributes used to describe in detail the monument. Depending on the special needs of the GI system, this base can be expanded to deal with more specific data: an example has been conducted data about planning activities or data about the financing of restoration works.
A field test of this data structure, defined as a case study applying the HISTOCITY method, has been conducted in the "Departamento de Urbanismo" of the "Diputacion Provincial de Sevilla" as one of the Project activities during 1997. Here the urban planning activities are assisted by a GIS, used to visualize information about the territory. The exisiting GIS lacks data about monuments thus reducing

the efficacy of the tool. The needs of the Diputacion were to have a DataBase Management System used for collecting, analyzing and printing data about monuments. All the data collected needed also to be geo-referenced as well, to for allow spatial analysis and the production of thematic maps automatically.
The system implemented uses the DBMS to collect raw data about monuments, then the GIS visualises this information. The planners can use the GIS as a support to develop the urban plan and once the plan is terminated all the maps needed are printed automatically.
Collecting data about monuments is also the responsibility of the Instituto Andaluz del Patrimonio Historico which must protect the most relevant monuments in the regional territory. The IAPH is developing a DataBase for cataloguing the monuments, but the quantity of data collected is still poor. Since the first design step, the structure of the DataBase for the Diputacion was made compatible with the one of the IAPH, to allow easy exchange of data between the two. The basic aim was to integrate the two catalogues: if IAPH has data about a monument, it sends the info to the Diputacion and viceversa. The compatibility is achieved using the same logical name for the shared attributes, so that the routines for data exchanging can be performed through SQL sentences. A very rigid structure for the relations avoids duplicate entries and logical errors.
The procedures to collect and store the data of the catalogue start from the analysis of the territory to get basic knowledge of the history and to identify the most important sites and monuments. The next step is to collect all the documentation about these monuments, including taking pictures and drawings illustrating the present state. Finally, the territory and the monuments can be catalogued by filing the data into the DBMS. The geographic information is represented by UTM coordinates of the monuments and, alternatively, by the code of the cadastral parcel. In fact it was necessary to provide different ways to visualise the data with the GIS, since the cartography available at the Departamento de Urbanismo is heterogeneous and a part of the provincial territory the cartography available doesn't contain cadastral information.
The information about the actual state of cultural assets are accessible dynamically inside the GIS application to produce maps, about the degree of conservation of monuments and use of the monuments to aid planning activities.
Once the plan is completed, the prescriptions are inserted into the DBMS to complete the catalogue and the information is displayed with the GIS to produce maps about protection level of monuments, designated use and more.
The integration of a DataBase of monuments into a GIS environment clears out the relationships existing between the territory and the historical asset, thus making urban plans more effective and, in some ways, easier to develop.
The same basic data structure can be used in other GIS application where it is critical to have a very precise perception of the value of a monument. We are currently developing a tool for coordinating restoration activities of different public administration with the aim of optimizing financing. This Spatial Decision Support System integrates data about cultural patrimony with economic data about financing of restoration works. Cultural Assests are becoming increasingly important as an economic resource, and better planning is one of the ways to allow sustainable development of historical cities.

Glossary

HISTOCITY: acronym of Historical Cities Sustainable Development: the GIS as design and Management Support, European Commission - Training and Mobility of Researchers Programme, contr. n°ERBFMMACT970265.
Departamento de Urbanismo: Urban Planning Department;
Diputacion Provincial: County Office;
Istituto Centrale per il Catalogo e la Documentazione: State agency responsible for cataloguing Italian historical patrimony;
Instituto Andaluz del Patrimonio Historico: Regional agency responsible for cataloguing historical patrimony of Andalucia.

Spatial temporal definition of cultural heritage and of geographic entities in the Risk Map project.

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Abstract. The Risk Map is the product of synthesis of GIS realised by the Central Institute for Restoration (ICR) in support of that methodological line that, for the conservation of the Artistic and Monumental Historical Heritage, proposes to place side by side restoration to the systematic activity of the prevention.

The paper is covering the area of application defined as the risk assessment of the cultural heritage. The project denominated Risk Map has been carried out by the ICR (Istituto Centrale per il Restauro). This project is based on some theoretical ideas of preventive restoration and programmed maintenance of all that is related to the cultural heritage: historical buildings, churches, archaeological sites, etc. Such a project is aimed at developing both systems and methods to support cultural heritage maintenance and restoration.
Various conditions, such as vulnerability or harshness of the surrounding environment are taken into consideration. In such a project, GIS plays a key role to support both monitoring, representation and decision making. Italian situation is peculiar due to the importance of its cultural heritage. It represents a unique test-bed for GIS applications in the cultural heritage fields.

1.The Risk Map project.

Some early ideas and examples of planned preservation of cultural heritage were applied by the ICR in 1975 in Umbria, a region in central Italy. In 1990 Italian Government passed Law N° 84 giving an operational starting to the Risk Map project which principally aimed an information system for cultural heritage protection and conservation.

In constructing such information system it has been adopted the concept of risk like reference model. Its definition comes down, in fact, from the relationship that elapses between the amount of damage that an event causes on a determined object and the probability that that event is taken place. However, considered that it is not possible to define a priori " the harmful event " and the " probabilistic mechanism " that generates the event, it has been decided to proceed to characterise the meaningful variables that