Proceedings of the XVIth International Congress of Classical Archaeology Boston, August 23–26, 2003

Common Ground:
Archaeology, Art, Science, and Humanities

CAROL C. MATTUSCH
A.A. DONOHUE
AMY BRAUER
editors

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Greetings to the Participants

I would like to greet all of our colleagues gathered for this extremely important event, thanking the organizers, especially Amy Brauer and David Mitten, as well as Karen Manning, and all of Harvard University, for the enormous labor that they have undertaken to welcome us. I need to apologize for my absence, and for my consequent inability to deliver this message in person – but I leave the task to the vice-president of AIAC, Elizabeth Fentress.

The mission of Classical Archaeology today is the necessary unity of research and of conservation of our classical heritage. These are two faces of the same coin. Today we are called upon to renew our approach with an ever-closer dialogue with the methodologies developed for other scientific disciplines, mathematics, the physical and biological sciences. The theme of this conference is thus entirely apposite.

However, we cannot forget that the interface between cultural heritage and modernity does not take place in laboratories and lecture halls alone, but also, and often with far greater conflict, in the field. The need to protect our monumental heritage and our landscapes, whose importance is incalculable, has daily to deal with the headlong development needs of Western society, and to find ways to collaborate with those needs. At the same time we are threatened by the encroachments of legitimate development, and we have also to cope with the looters who, as we speak, are working in all Mediterranean countries, and whose products end up on the antiquities markets. Here, while the supply-side must be dealt with by local police, we as archaeologists must work to control the demand, by persuading our friends and institutions to stay away from the purchase of unprovenanced antiquities. Although we all know how difficult this is, a powerful instrument for persuading institutions will be illustrated by Bonnie Magness-Gardiner, in the roundtable on the U.S./Italy Long-Term Loan Program. I hope that AIAC in the future will serve as a site for discussion, for the comparison of individual experiences in Classical Archaeology and historic preservation, and for the refinement of institutional sensibilities. Knowledge and preservation are two different names for the same reality. These are the motivations for two of our current initiatives. The first of these is the project *Fasti on-line*. This important new undertaking, sponsored by the Packard Foundation, is about to begin, and we would be grateful for input from all of you as to the form it should take. Our second new initiative is the new, on-line version of *AIAC News*, which I invite you all to read and respond to – we will be happy to publish your contributions to this and other debates. AIAC should do as much as possible to express the needs of its members, and in turn needs its members to survive. I hope that all of you who are not yet members will consider joining the association.

I would like to finish with a final thought. At Amsterdam we were able to announce Harvard's generous offer to host the next quinquennial meeting. This year no such announcement is possible, although discussions are underway. Thus any institution that is interested in hosting the 2008 meeting should not hesitate to get in touch with us. Candidates will be discussed at the next meeting of the AIAC council, and we welcome your offers.

I wish you a happy and fruitful conference.

Paolo Liverani
Musei Vaticani, Associazione Internazionale di Archeologia Classica, President 2003–2006

Introduction

The XVIth International Congress of Classical Archaeology was heralded by a stunning thunderstorm, and lightning struck the hotel, knocking out electricity as participants arrived for the conference (August 23–26, 2003). *Common Ground: Archaeology, Art, Science, and Humanities* attracted an enthusiastic group of over 400 scholars – archaeologists, art historians, and conservation scientists from twenty-five countries. One hundred forty papers, twenty-one posters, eight colloquia and two roundtable sessions presented new research and discoveries on topics including Classical Archaeology, museum studies, site preservation, historiography, and computer technology.

Opening remarks by Paolo Liverani, President of AIAC, were read by the Vice President, Elizabeth Fentress. In his keynote address, *Art, Science, and Unifying Vision in Classical Archaeology,* Professor George L. Huxley of Trinity College, Dublin, discussed the important connections between present and past, and stressed the need for a "unifying vision" in our studies of archaeology, literature, epigraphy, geography, prehistory and history, art, and technology. The collegial atmosphere of the sessions stimulated discussions of topics ranging from epigraphy to iconography, from ancient funerary practices to current directions in conservation, from buildings to cities to landscapes, and beyond. J. Rasmus Brandt, Past President of AIAC, delivered the closing remarks for the congress.

As the editors and organizers of the congress, we are very grateful for the help we have received from the members of the Program Committee and the Planning Committee, and particularly from the Harvard University Art Museums Local Committee whose tireless efforts before, during, and after the Congress ensured its success.

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To all of the above individuals and institutions, we are grateful, and we are pleased to present *Common Ground: Archaeology, Art, Science, and Humanities.*

Carol C. Mattusch, George Mason University
A.A. Donohue, Bryn Mawr College
Amy Brauer, Harvard University Art Museums

Note on Abbreviations Used

Abbreviations of modern journals and books follow the guidelines of the *American Journal of Archaeology* 104 (2000) 10–24. Ancient authors and works are cited according to the *Oxford Classical Dictionary* (third ed.; Oxford and New York, 1996) xxix–liv.

Archiving Cultural Objects in the Twenty-First Century: Pottery from Karabournaki

D. Tsiafakis, A. Tsompanopoulos, G. Pavlidis, N. Tsirliganis, V. Evangelidis, and C. Chamzas

The rapid technological evolution of the twentieth century, offering completely new possibilities, has already influenced, although on a limited scale so far, the methods used for the presentation and preservation of human history and culture. With the advent of the twenty-first century these technologies reached their maturity and made clear that for achieving the best results in archiving, preserving, and disseminating cultural objects, traditional scholarly research should be supplemented with the achievements of the exact sciences and technology.

Keeping that in mind, we will present our work in recording and publishing the archaeological material from Karabournaki (Fig. 1). Karabournaki is located in the North Aegean, on the edge of the promontory in the center of the Thermaic Gulf, near Thessaloniki.[1] The site preserves the remains of a settlement on the top of a low mound, its cemeteries extending into the area surrounding the bottom of that hill, while the ancient harbor reaches the lower part of the mound. Even though no inscription with the name of the ancient city has yet been found, several scholars have argued for relating the site to ancient Therma on the basis of its location and literary and archaeological data.[2] The majority of the antiquities revealed seem so far to come from houses dated presumably in the sixth century B.C.[3] The site is extremely useful for the scholar interested in pottery, since it preserves a great number of ceramics. Local pots are found together with imported vases, all in great numbers and of good quality. Geometric pottery, with a number of East Greek and Euboian fragments, is certainly among the earliest imports, but it is possible that some Mycenaean and Submycenaean sherds also come from the same place.[4] On the basis of them and of pottery found in the earlier excavations, it has been suggested that the occupation on the site was continuous from the Late Bronze Age down to Roman times. The majority of the vases, however, date to Archaic times, with East Greek – and all its known centers such as Miletus, Samos, Chios, North Ionia, and Lesbos – Corinthian, Attic, and Laconian being the principal categories of imported ceramics found.[5] The material evidence, both architectural remains and pottery, demonstrates that the site flourished during the Archaic period and at that time (and very probably earlier, in the Geometric, and later, in Classical times), was a place of meeting of influences from both East and West.

Facing the problem of recording the past in the case of the pottery from Karabournaki, we decided to combine the information provided by different fields in order to achieve the best possible study and publication of the site. The original idea was to include all the information regarding the objects – vases in our case – in only one database that will be easily accessible to the excavator or curator of the material as well as to any scholar or even the general public anywhere in the world. The execution of that idea turned into a collaborative project of specialists in various fields.[6] Archaeologists, art historians, nuclear physicists, chemists, and conservators are needed to provide the necessary information for each object. To create the database, however, and make it accessible through the Internet required the contribution of experts in the use and application of new technologies.

While working on the execution of the project, the original scope was extended beyond the pottery, and in its present form it applies to the entire excavation. The focus now is on designing and constructing a database system containing all the available information regarding the site, with extended search and visualization capabilities that can deliver multilingual content over the Internet.

The results of the project are:

a. an Internet version and
b. a multimedia database containing all the existing information regarding the site (architecture, objects), available for any type of use, study, and publication (Fig. 2).

The major difference between the two is that for the Internet version, the excavator/curator always maintains the option/control to choose and decide the full amount of the information presented (categories of material, specific fields

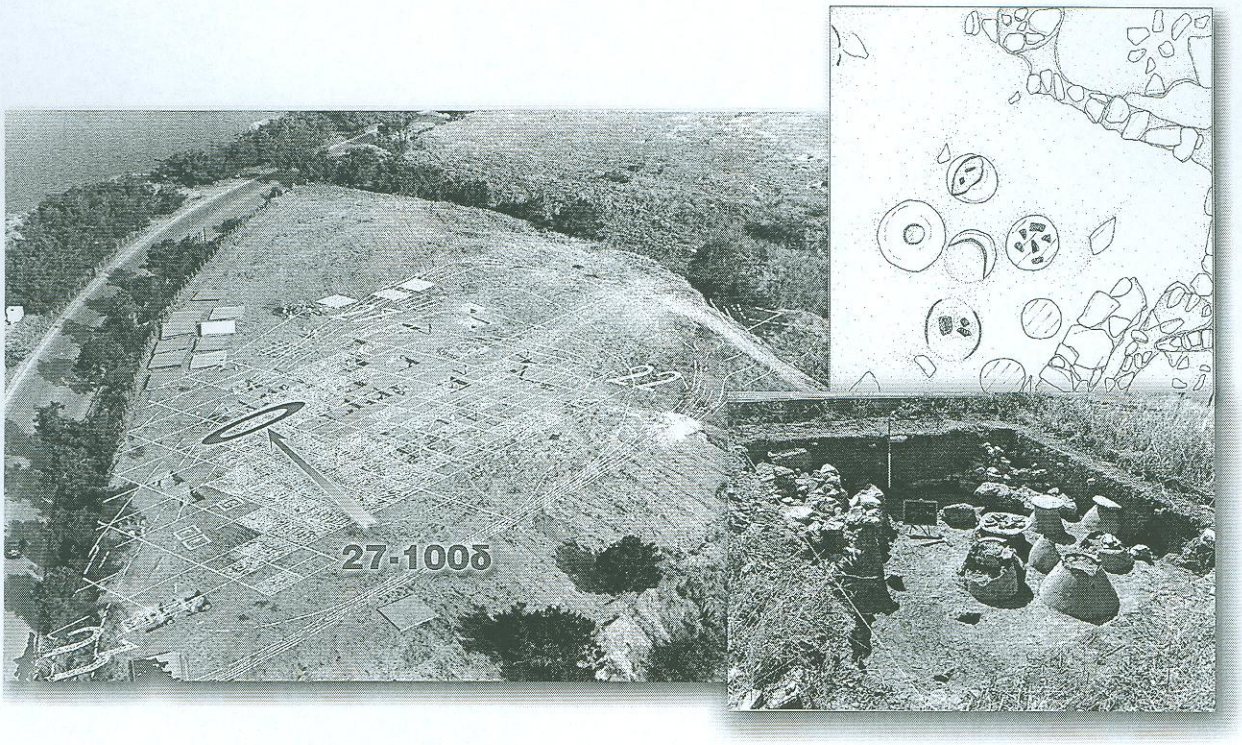

Fig. 1. Karabournaki: trenches

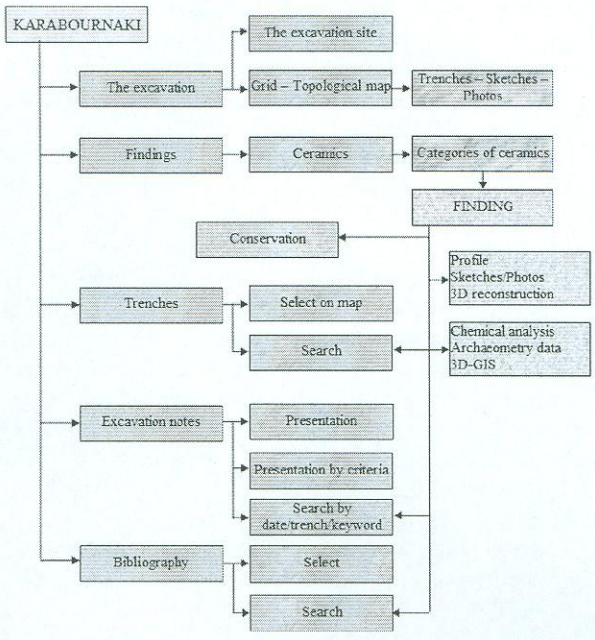

Fig. 2. KARABOURNAKI excavation database diagram

from the records, photos, drawings, etc.), meaning simply that (a) is always part of (b), and (a) is always defined by the excavator. In order to make the database accessible to any user universally, it was decided to be bilingual, with the two chosen languages Greek and English.

Figure 2 shows the general structure of the database entitled KARABOURNAKI. The web interface design for the Internet users will be based on the same scheme. The database system is divided into five parts:

1. *The Excavation*, holding all the general information needed for the site, meaning introductory texts, maps, and photographs. Of particular importance here is the use of GIS (Geographic Information Systems),[7] a system used to store, combine, manipulate, and analyze geographically referenced data of different types. In the case of Karabournaki, through GIS it is possible to integrate different formats (texts, photos, external databases, 3D reconstructions, etc.) of the excavation on a geographical map and to explore the placement of an ancient settlement in relation to others in the same region, in our case Thermaikos.

2. *Findings* is the second part of the database system. Here will be data regarding the various categories of the objects unearthed. In the case of Karabournaki the major group is Ceramics. This sub-category is divided into the various *categories of ceramics* found on the site (e.g., East

Greek, Attic, Corinthian, etc.). Each *category of ceramics* will lead to the individual records of the fragments.[8]

Each fragment/object has three different types of records: a) *the archaeological* or *art historical*, b) the *conservation* and c) the *chemical analysis/archaeometrical.*

(a) The *archaeological record*.[9] This contains all the available archaeological data and it has four different sections of information:

i) *General Data* regarding inventory nos., shape, fabric, etc.,
ii) *Dimensions*
iii) *Time & Space* regarding dating, provenance, artist, etc., and
iv) *Description* with information on inscriptions, comparanda, and remarks.

(b) The *conservation data* record concerns all the information about the condition and the treatment of the fragment/object.

(c) The *chemical analysis/archaeometry data* record includes data regarding the composition and the characteristics and properties of the material of the artifact as well as other miscellaneous information extracted by technological means. References and links to the original measurements and raw data are included for completeness and possible future reexamination and reevaluation. The reference part is extended also to other similar data sources (for example, chemical composition databases) where available, in order to support further study of the object (for instance, provenance). This record incorporates three section areas:

i) *Composition of the material*, referring to the stoichiometric and/or mineral composition of the sample. This section is distinguished in *Surface or volume composition* and *Point or bulk composition*,
ii) *Properties and technological information*. Properties refer to the physical or mechanical characteristics of the material of the sample (e.g., porosity, hardness, etc.). Technological information refers to manufacturing parameters deduced from various measurements and observations (e.g., firing temperature, oxidizing or reducing atmosphere, etc.), and
iii) *References* that include the archives to all measurements, raw data, and plots of the results. This material is available for future reexamination and/or evaluation of the extracted data.

The last part regarding the fragment/object includes all the photos, drawings and profiles. In this part we also include 3D reconstructions of particular fragments in order to present them in their original form and make them more understandable and accessible to both scholars and general public (Fig. 3). This section also relates objects with trenches or as we say it has a 3D-GIS part.

3. *Trenches* is the third part of the database (Fig. 2). Here are stored all the drawings of each trench with the possibilities of selecting, searching, and zooming in on each of them and, furthermore, linking to findings, notes, and other related information in the database.

4. *Excavation notes* is the fourth part of the database. Here will be stored and presented all the notebooks of the

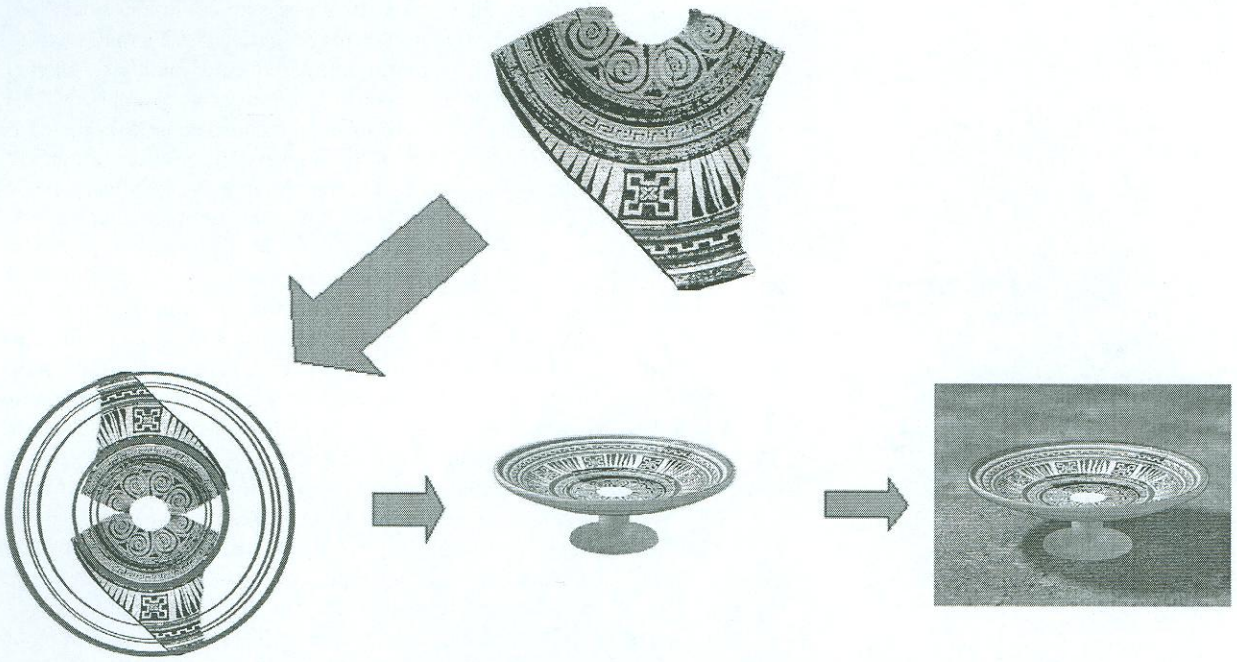

Fig. 3. East Greek fruitstand from Karabournaki: 3D reconstruction (Chr. Xanthis)

excavation together with summaries of each trench. There will also be the possibility of searching that scanned material, to make it more useful to the user by providing links to findings and trenches or any other related information.

5. *Bibliography* is the last part of the database. The bibliographical references include all the known bibliography for Karabournaki as well as important references regarding the various categories of objects.

All those parts are interconnected in various ways through the use of a sophisticated search engine. The latter plays a very important role in the entire application and therefore must be as flexible as possible to accommodate the needs of every user.

The achievement of our goal in creating the database system presented here, involves the combination of several existing technologies as well as the development of new ones. The most important are shown in Figure 4. The data input can be done in a two-fold way: by using a specifically designed software for off-line on-site data input; and by using specific forms written in Rich Text Format (RTF). All completed input forms are gathered and are either automatically fed to the database or parsed by a specially designed PERL parser,[10] which undertakes the task of interpreting a form into a format perceivable by the database.

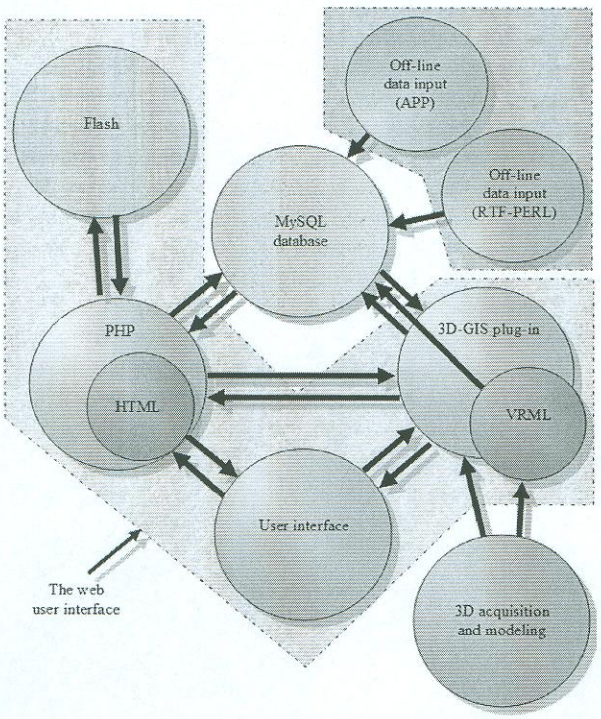

Fig. 4. KARABOURNAKI excavation database: technologies used

Penetrating a little deeper into the technological domain, we can specify the adopted technologies:

1. *MySQL* was adopted as the main database system. MySQL is an SQL-based[11] database system that is very efficient for web applications. It complies with the relational model and distributes the content into easily manageable and flexible tables.

2. To overcome the problem of universal compatibility with respect to the linguistic aspect and the multilingual character of the content, the Unicode Standard was employed.[12]

3. To combine multimedia, databases, and the Internet on a single interactive environment it is necessary to design an enhanced user interface for the web. The standard programming language for the web is the Hypertext Markup Language (HTML).[13] HTML is written in plain text, but the resulting web pages are static. In most cases, however, the need for dynamic content is dominant. Therefore it was decided to use PHP,[14] a programming language able to construct dynamic pages, meaning pages with their content dependent on the user's request.

4. Another important aspect of such an interface is the artistic point of view. Here Macromedia Flash was chosen,[15] an integrated high-productivity authoring tool with the ability to publish appealing content over the Internet.

5. Taking a step forward in the user interface design domain we reached the borders of Virtual Reality (VR). Basically, VR is about using computers to create images of 3D scenes with which one can interact and navigate. Although the Internet was used initially to communicate text and two-dimensional (2D) graphics, it was soon realized that it could be used to process three-dimensional (3D) graphics. Almost overnight VRML[16] (Virtual Reality Modeling Language) appeared and enabled Internet browsers to interact with 3D environments. Among the most widely used software to implement realistic 3D worlds is 3D Studio MAX.[17] It offers several different modeling technologies with great representational capabilities, while maintaining compatibility with other architectural and GIS software and systems and the VRML.

6. At the final step of the user interface design, one must consider what happens when existing technologies are not enough for the work at hand. In such cases the designer has to think of implementing new technologies to fill the gaps. In order to be able to deliver these new technologies to any user through the Internet, the developer usually takes the path of creating new pieces of software, called Plug-ins.[18]

The combination of these technologies with the archaeological, archaeometrical, and conservation data leads to the creation of a digitized excavation that enables the scholars to handle and study all the available material in a multifunctional way. Furthermore, through the Internet version, available on the Web, the site of Karabournaki becomes known and accessible to everyone universally before the final publications, which might take some time to appear.

Notes

Special thanks are due to Professor M. A. Tiverios, director of the current University excavations at Karabournaki, for providing full access to the excavation material and to Lecturer Dr. E. Manakidou, associate of the excavation, for her collaboration. The authors are also grateful to D. Papadopoulou for her participation in the process of the project, and J. Podany and Ath. Velios for their contribution to the creation of the "conservation record." The 3D reconstruction of the fruitstand is due to Chr. Xanthis.

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4. Tiverios 1987 (supra n. 2), 247–260.
5. For the East Greek pottery from the site see esp. D. Tsiafakis, "On Some East Greek Pottery found at Karabournaki in Thermaic Gulf," in F. Krinzinger (ed.), *Akten des Symposions Die Ägäis und das westliche Mittelmeer. Beziehungen und Wechselwirkungen 8. bis 5. Jh. v. Chr., Wien 24. bis 27. März 1999*, Vienna 2000, 417–423. For Corinthian and Attic imports see E. Manakidou, "Korinthische und attische Import Keramik der archaischen Zeit aus der Siedlung von Karabournaki/NordGriechenland," in B. Schmaltz and M. Söldner (eds.), *Griechische Keramik im kulturellen Kontext. Akten des Internationalen Vasen-Symposions in Kiel vom 24. bis 28.9.2001*, 2003, 193–196.
6. The working team on the project consists of experts in archaeology/art history (D. Tsiafakis, V. Evangelidis), nuclear physics (N. Tsirliganis), and engineering (C. Chamzas, A. Tsompanopoulos, G. Pavlidis).
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Cultural and Educational, Technology Institute (CETI), 58 Tsimiski St., GR-67 100, Xanthi, Greece
tsiafakis@ceti.gr
tsompano@ceti.gr
gpavlid@ceti.gr
tnestor@ceti.gr
vasevang@ceti.gr
chamzas@ceti.gr