Volume 1

… Being wise causes affliction: someone who is improving science is also

[Bible, out of Ecclesiastes, I]

Introductions

EXPLOITATIONS AND COMMUNICATIONS

Introductions

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General Index

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ICON KEY

- What?
- Who?
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- How?

1. Scientific Problem organisation

The meaning, use, development and testing of the following terms: **Development, execution and monitoring; Technical basis; Human capacities; Methods, protocols and tools; Outsourcing; Computer Aided Design/Drafting, Architecture Engineering and Construction, Data sharing, Co-operative Approach to the Realisation of Internet Based CAD, GIS work, Engineering Document Management, Product Data Management, Quality Assurance, Work Flow Modelling and Management** in order to allow the comprehension of the mission and objectives of **CaribCAD** in relation to the aim of making CAD on the Internet and preparing the future.

2. CaribCAD

CaribCAD (Co-operative Approach to the Realisation of Internet Based CAD) is a research project the basic goal of which was to allow the making of CAD (Computer Aided Design) on and by mean of an extensive use of the Net (Inter- and Intra-).

WHAT?

3. Objectives

. 1. General objective:

It was to develop the **technical basis**, **human capacities**, **methods**, **protocols** and **tools** needed for the distribution of CAD workloads from engineering companies in Europe to specialised companies in Developing Countries.

. 2. Specific objectives:

They were:

1. To create well trained teams in Europe and the Developing Country [Caribbean] in order to achieve comparative levels in research;

2. To set research parameters on protocol development, data sharing, work flow management and quality control over the Internet;

3. To realise co-operative solutions in key target areas, such as:

   - the digital storage of the existing European building heritage;
   - the management of the urban environment through efficient GIS application around the world;
   - the smoothing of peak loads in the CAD workload of European engineering enterprises, with an emphasis on labour intensive CAD work in detailing and client presentations;

4. To disseminate the results through various E-media.

. 3. Perspective of approach:

The already mentioned objectives were approached in the wider perspective of enabling Developing Countries to become players in the future global co-operative Architecture and Engineering Community.

The project developed opportunities, methods and facilities to exploit the increasing potential of Internet-based global co-operation. It did so for a specific client domain and a specific region but results can be equally relevant to other domains and many developing regions of the world.

Contrary to the "one sided" outsourcing practice, the project was committed to creating equal opportunities for both European and Developing Countries in terms of economic benefits and human capacity.

WHO?

4. Approach:

The project brought together technologies from the fields of the **World Wide Web**, **co-operative engineering**, **workflow management**, **data sharing** and **Intra/Internet** together to a context of North-South co-operation.

The target domain was architectural design and urban engineering. The project built on the platform of existing and proven approaches in **CAD/CAE** and **GIS**. It explored the most promising techniques from Tele-CAD and adapted them for "outsourcing" purposes. A foundation was laid to support migration of the

emergent integration technologies in **Product Data Management** and **Engineering Document Management**. Rooted in the above base-line technology, the project team, consisting of a mix of **Universities** and **architectural CAD firms**, set up a number of **pilot** projects to develop, execute and monitor actual outsourcing practice. Two PILOT projects represented different ambition levels for Europe-DC co-operation:

PILOT 1: Europe « DC outsourcing of CAD work (mainly drawing and visualisation)

PILOT 2: Europe « DC "joint venturing" in overseas projects

The pilots dealt with all the implications of "distance", i.e. multi-social, multi-lingual, multi-time zone and multi-cultural co-operation. The project concluded with:

Intra DC Benchmark: co-operation in sustainable urban development across dispersed DC partners.

5. Impact of results:

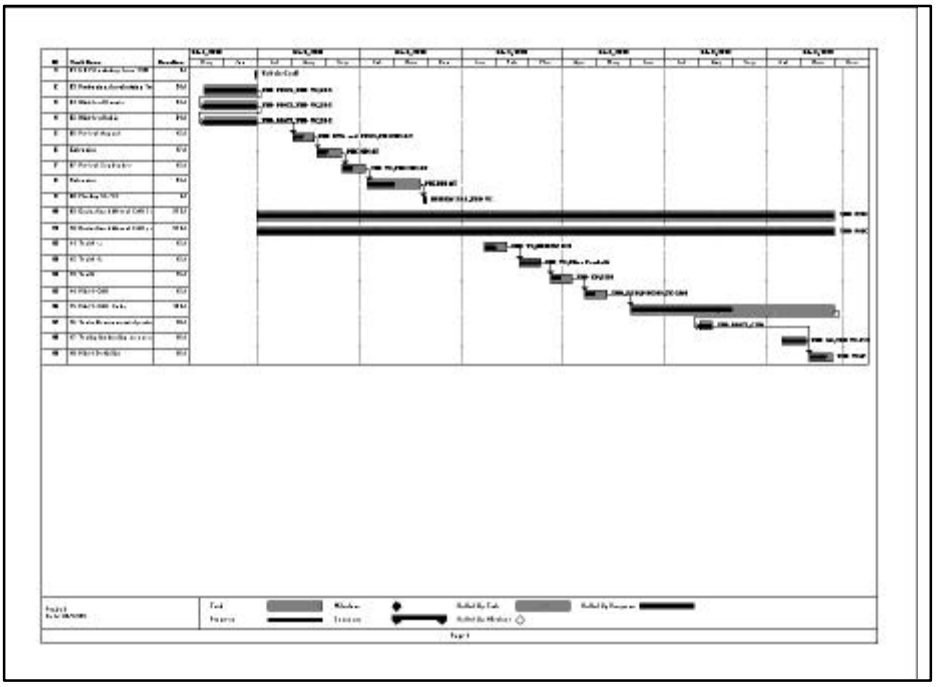
The project will hopefully create business opportunities for distant engineering with mutual benefits for European architectural firms and DC firms. The immediate European benefit is increased competitiveness in the global engineering community. On the DC side, the project will create the potential for firms to become players in the supply of specialised services over Internet.

The pilot projects and benchmarks have been designated to create momentum in areas that have great potential for Europe-DC and intra-DC co-operative engineering.

6. Exploitation:

The present manual as well as disseminating the results over the Internet and through workshops with end user involvement from both communities will be an important aspect of exploitation. A "partnering" WWW site, already operative, is aimed to enabling European clients and DC service suppliers to "partner" for specific services. The PILOT projects are used, in the present text, to develop examples of business plans for outsourcing commerce, emphasising re-engineering workflows, QA methods and commercialisation aspects.

7. Time schedule:



8. Making CAD on the Internet and preparing the future

Process Characteristics:

Globally, the outsourcing process of digitising paper-based drawings will have the following steps:

1. EU prepares existing paper based drawings and send them to DC;
2. DC digitises the drawings and send them to EU;
3. EU uses the received CAD drawings for its purposes.

Limiting Solutions

It has been agreed that drawings can be sent both as scanned raster images as well as paper documents by normal mail.

It has been agreed to use AutoCAD™, actually not the best architectonic CAD program on the market, due to its vagueness, but the one used by clients [for its vagueness], and because it is actually the standard in CAD formats.

It is studied the way of using CAD tools more architectonic-based, based or not on AutoCAD, or to create rather new tools to automate the process. The last version of AutoCAD, release 2000™ together with the Architectural Desktop™ have lately been extensively tested and demonstrated new potentialities, and some implementations of CaribCAD discoveries. This fully demonstrates the validity of the practical and pragmatic ideas implemented by TUD since the very beginning in its testing.

Organisational conditions

The legal implications of making a contract through the Internet were explored even if not completely defined and not completely clarified:

What is the legal status of a digital signature;

Which general contract conditions are applicable: Dutch, Dominican or International conditions or will it be necessary to design a specific set of conditions for the occasion;

Which are the possible sanctions if one of the contract parties does not meet with the contract conditions?

How can information sent by email be protected against misuse by (unknown) third parties;

The effort that EGM put into the preparation of the paper based drawings and the adjustment of the CAD files sent by TECAM was minimal thanks mainly to the innovative procedure developed by TUD. Because otherwise it would just be too small a step for the client to digitise the drawings themselves.

During the project it proved to be successfully, when possible, the option of direct daily basis communication. In many cases the resolution of "tricky" problems was made easy by such a tool.

WHAT:

9. TUD-testing Objectives

General objective:

Together with the general objectives of Caribcad, previously mentioned, it is to test sending/receiving procedure and data of outsourced material, compared to original material in order to understand what should be the sending methods, procedures, protocols, tools etc. To discover by conducting

deep researches what should be the CAD issues, tools criteria and tools developing requirements of an outsourcing project and of this in particular; to test what are the existing/new tools and criteria, usable or needed by the real Pilot1 Test. This was done by:

- Creating a well trained team in Europe by performing researches over all the previously mentioned subjects, and trying to inform or incite the Caribbeans to do the same in order to be able to perform the test;
- Setting research parameters on protocols, data sharing, and quality control over the Internet;
- Performing, whenever possible, the test itself.

These objectives were approached in the perspective of giving advice, information, and results to the future performers of Pilot 1 Test, EGM and-TECAM. The Pre-testing has developed and studied procedures, methodologies, systems and facilities to facilitate the Performance, Evaluation and Implementation of the material object of outsourcing.

The Pre-testing often demonstrate that the state of the art is still virtual from an Outsourcing point of view. And the way to creating equal opportunities for both Europe and DC's in terms of economic benefits and human capacity is still a long way to go.

HOW:

10. Approach, how:

During all the testing phase, different technologies from the fields of the **World Wide Web** [Internet, Intranet, E-mail, Pagers, and FTP] **co-operative engineering** [different 2D and 3D CAD programs], **workflow management tools** [Keyflow, MS Project and the internal facilities of MS Outlook], **data sharing** [Dutch and European conventions, normal practices and international translation and information] in a context of North-South co-operation were extensively researched and whenever possible brought together

WHO:

11. Approach, who:

The testing team was mainly composed by researchers, co-operators, advisors and professors of the Technische Universiteit Delft, with various partnership varying from the institutional partners being the Caribbean University PUCMM, EGM Architecten BV, and TECAM, to private Dutch companies, and architects, advisors, partners in Cuba, India and Russia. The followed scheme has always been a bi-directional direct contact Client ↔ Performer strove for the outsourcing of CAD work (mainly drawing and visualisation) and dealt with all the implications of "distance", i.e. multi-social, multi-lingual, multi-time zone and multi-cultural co-operation.

WHY:

12. Impact of results:

The testing phase tried to create education and instruction opportunities with mutual benefits both for Europeans and DC's. The immediate European benefits were in research results, increased competitiveness of the partners, ability to handle the state of the art in CAD production, procedures, and researches. Thus the participants were able to improve their position in the global engineering community.

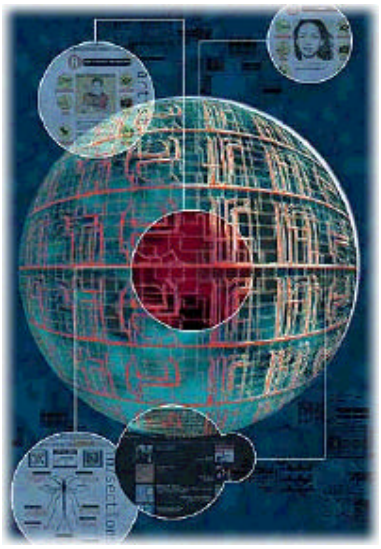
WHERE:

13. Exploitation:

The present manual, together with the future conferences, the Internet exploitations, and dissemination of results are intended to create curiosity and interest over the subject in future Outsourcers and to create momentum in areas that have great potentials.

THE ALEXANDRIA MYTH IN DIGITAL SAUCE

14. About this Manual:



Tholomeos I, Egyptian pharaoh in the course of the III Century BC, had a dream: to encompass in a huge library all the human knowledge. He then decided to call together the highest historians, philosophers and mathematicians of his time, and to put at theirs disposal more than one thousand travelling scribes. They went around those days' known world, brought together all the material into circulation and transcribed it on papyrus scrolls. The operation lasted tens of years and completed by the pharaoh's son, Tholomeos II. At last the Library of Alexandria ended up with a collection of 700.000 volumes, this is what the tradition says, concerning any knowledge's branch. This lasted until the year 47 BC, when Giulius Caesar's armies conquered the city and set that cyclopean masterpiece on fire. Since then the idea of a Total Library has become a myth. Even because never again the humanity has ever been so closed to its realisation. It is therefore peculiar that the myth of the Alexandria's library is coming back under the spotlights after thirty-three centuries, thanks to the potentialities offered by the actual information technology. And that its new face be the most advanced of Communication' Technologies, the Internet. This manual, as the out-coming result of a team involved in an Internet based project, will humbly try to give its own contribution to this new World Wonder ironically defined "The Alexandria myth in digital sauce"… the World Wide Web.