THE GAU:DI PROGRAMME CASE STUDIES
ON PRESERVATION OF ELECTRONIC DOCUMENTS

The archivists working on architectural records – whether in an archives or a museum, or within an architectural practice – will be dealing more and more with records kept on electronic media: this has now become obvious to all. However, so far, in most European specialised archives centres, no holding containing such items has been processed, nor even, in most cases, received.

A small number of such specialised centres for architectural archives have decided, four years ago, to join their efforts to investigate on these new grounds. They have done so in the frame of the Gau:di programme\(^1\), which I will rapidly introduce in order to give an administrative and chronological framework. At its end, in two years, this project on architectural archives (‘Gau:di/Architectural Records’) will include a conference, to be held in Paris late 2007.

At the 2004 ICAM conference, in Venice, Eleanor Gawne, from the RIBA, and Riccardo Domenichini, from the Istituto universitario di architettura di Venezia, presented the project as it had developed then and the website that was just being completed. The site has been online from then on.

The Gau:di programme

\[\text{www.gaudi-programme.net}\]

The European Gau:di programme as a whole was conceived by the Institut français d’architecture and a few other specialised centres for the dissemination of architecture: the CIVA in Brussels, which is today the coordinator of the general programme, the Architekturzentrum in Vienna, or the Finnish Museum of Architecture, for example. It was granted a three-year 1.9 million Euro funding by the European Community (Culture 2000 programme) for the period 2002-2004, and was then able – rather exceptionally – to obtain a second three-year financing, nearly as high, for the years 2006-2008. In each one of these two cycles – Gaudi I and Gaudi II –, the programme is made of eight to ten different actions about architecture: its teaching, its dissemination, its quality, its preservation. Let us mention workshops which permitted European architectural faculties to meet for joint actions, an architectural Festival, exhibitions, a database of remarkable

\(^1\) Gau:di stands for ‘Governance, Architecture and Urbanism: a Democratic Interaction.’
projects on public space, an exchange and publishing arm... and a specific action dedicated to architectural records, coordinated, for both cycles, by the 20th Century Archives Centre of the Institut français d’architecture (today belonging to the Cité de l’architecture et du patrimoine) in Paris, and granted Euro 210,000 for Gaudi I and 180,000 for Gaudi II.

We are today about eight partners. Although most partners remained the same from one cycle to the second, the NAI and the MFA eventually do not take part for Gaudi II, whereas the Norwegian National museum of Art, Architecture and Design joined the group.

**Architectural Archives in Europe: a website in progress**

The Gaudi I programme on Architectural records led to the creation of a specific bilingual website ([www.architecturearchives.net](http://www.architecturearchives.net), independant from the general Gau:di website but also accessible through it), dedicated both to architects and researchers. Browsing through it, one gets an overview of the action led during Gaudi I.

There is first a portal giving access to websites mentioning architectural archives, mostly sites of archival institutions or architectural centres. So far, this portal mostly supplies information concerning the countries directly involved in the project, plus two or three more like Estonia and Spain. We are trying to extend this portal to other European countries, or to countries which are close neighbours of Europe (such as North African countries, not to mention Turkey), but this cannot be done without the implication of architectural museums or centres in those countries. We would be pleased that some other ICAM members get involved in it and enrich its information.

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2 In short hereafter: IFA.

3 Fondazione Archivio del Moderno (Switzerland), Centre des archives du monde du travail (France), Centre international pour la ville, l’architecture et le paysage (Belgium), Deutsches Architektur Museum (Germany), Institut français d’architecture (France), Istituto universitario di architettura di Venezia (Italy), Museum of Finnish architecture (Finland), Ordine degli architetti di Roma e della Provincia (Italy), Royal Institute of British Architects (United Kingdom), Nederlands Architektuurinstituut (The Netherlands), Nasjonalmuseet for kunst, arkitektur og design (Norway).
A much more difficult task was to write *Recommendations*, or *Guidelines*, on managing records within architectural practices. It proved not easy to write a text which was to be addressed both to worldwide-sized practices and to architects working practically alone; which was to be coherent with every national situation; above all, which was to actually bring clear and reliable information on the preservation of *electronic* records. About these, during Gaudi I, we learnt a good deal, but mostly realised how much we still had to learn: we are mostly archives curators without an architecture training and not specialised in managing digital records. Defective as they are, the *Guidelines* can be downloaded from the site in six languages, in the form of a forty-page PDF document. We hope some other translations will appear.

Before sitting down to write this document, we had begun with a *survey* (also downloadable) made in about one hundred architectural practices of various sizes and ages, in our different countries. The main objective of this survey was to build up an up-to-date knowledge of what the firms did with their digital records. Although we learnt some interesting things about the way more traditional media documents were stored and produced, this was by no means the major point of the survey.

**New orientations for Gaudi II**

In the recently begun Gaudi II cycle, we are taking this website as a starting point for two actions:

First, we wish to address the architects more accurately – perhaps not to elaborate our guidelines but rather to simplify them: a very short version is being prepared, since it is clear that architects will not read forty pages about archives. We are trying to give a new presentation of some points which have until now remained somewhat abstract in our document, such as the use (and usefulness) of metadata. We have begun to evaluate how the *Guidelines* are received: some firms commented to us that, looking for information about records management, they came by themselves across them on the web; nevertheless, the person in charge of what we would call archives management, although he or she finds the document interesting, just cannot oblige the project architects to read and to use it. This was the case, for instance, at the Renzo Piano firm.

Secondly – and focal to this presentation –, most members of the Gaudi/Architectural records working group have planned to lead a *case study* on digital records, during 2006 or across 2006 and 2007. Indeed, we feel that
only such full-scale tests can help us better understand the issues to be addressed, and test some possible solutions. The reports on these studies will be the backbone of our conference in 2007. For easier presentation, we may divide these six studies\(^4\) in two equal groups: three of them will closely consider the way a digital archive – of a practice either active or recently closed – can be processed in a specialised repository, while the three other ones will rather involve a working practice, in a double approach of day-to-day use and of long-term preservation for future research. Especially interesting to mention about these studies is the fact that each one of the partners could eventually choose a prestigious archive or practice: the value of the study should thus be enhanced by the value of the architecture itself.

Let us have a look at these six studies, insisting on what each one is trying to bring into light, and on the first elements already under discussion in some of them – as far as I know the two more advanced, besides comparable in many aspects, being those carried out by the IFA Archives centre in Paris and the Archivio Progetti in the IUAV in Venice, which I will both describe more in detail.

**Records kept in practices**

The three first studies will closely involve the architects practices, which have accepted to spend some time on considerations that are new for them.

**A.** The RIBA in London has chosen to work with Wilkinson Eyre. Chris Wilkinson and James Eyre’s firm was created in 1983 and has been twice awarded the RIBA’s Stirling Prize, in 2001 to the Magna Centre in Rotherham, and in 2002 to the Millenium Bridge in Gateshead. The project involves studying and reporting on the practices and procedures used for managing electronic archives within the firm, but also deciding on the best means of acquiring these electronic archives for the RIBA. The image the practice chose to represent itself on its website – a very common image today, one can consider – goes well along with what we are talking about: a row of computers, and a team of young designers working in a jumble of paper documents, drawings on screen, and coffee mugs. The high-tech use of materials and technology the firm claims to make goes along with the fact that it uses electronics – way beyond the simple drawing – since their very

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\(^4\) In fact probably seven, including one additional to be developed by the CIVA in Brussels.
beginning; indeed the firm was created just when electronics began to be
used for architecture.

B. Snøhetta, the firm retained by the Norwegian National Museum, is
somewhat younger than Wilkinson Eyre. The firm gained international
reputation with the Alexandrian Library in Egypt. It won the competition for
the World Trade Center cultural centre in New York. However, most of
its projects are large public commissions in Norway, such as the Oslo Opera
house or the Bergen high school of art. The firm has two offices, in Oslo and
in New York, with 65 employees.

Although the study will mostly focus on one project largely under way, the
Oslo Opera, planned to open in 2008, it will also contain a birds-eye view on
the totality of electronic media in the office – internal communication, daily
journal, administration and design programmes –, and a study of the design
routines and the way old records are accessed. The study will be based on
interviews and site studies; it will involve both the architects and the data
consultancy company. Part 1 of the study will investigate the ‘e-archives’ of
Snøhetta, part 2 (to be held in 2007 and in connexion with the Norwegian
National Archives) the long term storage and access issues.

C. The third set of observations of how practices work with electronic
documents is a multiple survey to be made by the Roman Order of architects
(more exactly by a Roman independant architect). In fact there will be a
series of surveys, less detailed than the previously mentioned ones, in three
or four Italian practices, the most famous being the Renzo Piano Building
Workshop, in Paris and Genoa: the firm has since long been thinking about
a foundation – a centralised repository in Genoa –, where records produced in
different places (Paris, but also Berlin for some projects) are to be brought
together. Renzo Piano is nearly seventy, and it seems that, so far, the firm’s
architects have mostly followed their own inspiration in the creation and
preservation of digital files, while some rules could more easily be defined for
some traditional media, for example for the disposal of working models. The
two other firms, in Rome, are Alfonso Mercurio and Piero Sartogo, both
created in the 1960s.

Preserving electronic archives

As opposed to these nordic or southern projects, a sort of medium axis
developed, a geographical arc Paris-Mendrisio-Venice, along which the
problem was seen from the other end – this other end being perhaps more
familiar to archivists since closer to their traditional concerns. The issue is,
then, not any more how records are to be produced electronically, but how
such records can be received and processed, stored for long-term use,
retrieved and given access to outside of the production context.
There are here some studies already at hand, namely the very elaborate one published by the Art Institute of Chicago, already presented at the 2004 ICAM conference (and again in this one, with its further developments, by Carissa Kowalski), which confirmed the overall validity of the OAIS global acquisition and processing model. After evaluating a wide range of formats, that study advised to convert all files into two formats only, PDF and TIFF, considered as especially sustainable. That study, though, is museum-oriented: it clearly matches the needs of a museum collecting collection items, which, although they are not always independant pieces, are normally not organically linked large sets of objects as are archival fonds with their many hierarchical levels. Besides, converting an architectural drawing file into a PDF document implies a series of choices which, so we consider, differ deeply from those an archivist is used to make. Therefore we have to check the validity of the Art Institute’s methods if applied to whole archives, and especially to evaluate the time requested for the processing.

A. Mario Botta’s Ticinese firm has been selected as a case study by the Archivio del Moderno in Mendrisio. This study concerns both archival care in a historical repository, and records management and production within the firm. The Botta firm is an active society, whose concern both for electronics and for archives is rather different from what can be observed in the previously mentioned practices – with the possible exception of Piano. Botta himself created the Mendrisio architectural faculty a decade ago and equipped it with an efficient archives centre; there is a sense for history underlying his action, which is both international (namely in France and Italy) and strongly rooted in his Italian Swiss canton. The work to be realised by the Archivio del Moderno is acutely related to the moment the firm began working with computers, which is dated back to 1993: four projects will be processed into the archives, one – a house in Canton Ticino – designed just before that year, conversely one very recent which is the reconstruction of the Scala in Milan, and two other ones which both have had two separate phases, the first being very close to 1993 (the MART museum in Rovereto near Trento, and a church near Bergamo). Mario Botta, 63, is used to hand-drawing and he had about thirty years of practice before there were computers. The work will be done in close relation to the people in charge of the archives within the firm, and under the interested glance of Botta himself.

B. The two last studies will not have this benefit. Both architects taken as study object by the IUAV (Archivio Progetti) and the IFA, Giancarlo De Carlo
and Pierre Riboulet, belong to an older generation, already part of History. Both were born in the twenties and died recently, Riboulet in 2003 and De Carlo in June 2005. Neither one of them has probably ever touched a computer. Both nevertheless held the last decade of their activity in a context where electronics had become familiar, including in their own firms. They are architects of deep knowledge and thought: De Carlo took part regularly in the Team X meetings, and he nurtured the group’s reflections with a specific concern for historical background and site; during exactly the same twenty-year period, from the late fifties to the late seventies, Riboulet was a member, with Jean Renaudie and others, of a collective firm important in the French context, the Atelier de Montrouge. This collective firm, just as Team X, was born in the vestiges of the last CIAM conferences, and it always kept an eye on international movements such as Team X. The architects’ main conception tool – as one can expect in the sixties and in the context of the late modernism – may have been speech even more than pencil: however, Riboulet had a very strong and personal relationship towards drawing, he used to conceive alone and from end to end very large projects hand-drawing each floor in every detail, as can be seen in his published diary of the conception of the children hospital Robert-Debré in Paris (completed in 1988), which he designed alone as a competition entry during the summer of 1980.

The Riboulet and De Carlo archives: comparable approaches

Both for IFA and IUAV, these are the first archives received containing electronically produced items stored on electronic media (i.e., not scanned images, nor outprints of CAD designs). The electronic files certainly largely reduplicate the paper prints: we can therefore consider them as ideal exercise grounds. In both cases, the paper archives have already been received a few years ago: the De Carlo paper archive is now completely processed and its inventory can be found on internet, whereas for Riboulet there is only a rough inventory of the holding. De Carlo’s electronic archives were taken by the Archivio Progetti out of the firm’s hard disks – out of the hard disk of each computer, to be precise – and copied on CDs project by project, otherwise respecting the wide disorder in the naming and regrouping of files in directories. Riboulet’s files were perhaps better treated: when Riboulet died, the young architect who was in charge of the computer management (if there was any) spontaneously made this cleaning of hard disks and began organising the subdirectories of each project.

Both practices seem to have made a rather elementary use of electronic tools, which were used to draw plans, sections and elevations, but scarcely to create axonometrical sections or renderings, and certainly not for 3D effects or flythroughs. The only drawing software used in both cases was AutoCad. All remaining files are in very common image or office formats. At De Carlo’s
firm naming seems to have been left to the entire choice of the authors of the documents, at Riboulet’s there were some attempts to define regular naming conventions for files or layers but no convention did ever acquire general authority. So much can be said about the printing conventions, colours, line thicknesses, etc. One can even guess the period a project was conceived, or the age of the project architect, by observing how closely the AutoCad drawings imitate the manual drawing procedures.

For both archives, historical research, not the architects’ needs, must now lead the archival processing. So we are now facing the issues of storing, describing and accessing these documents. They constitute a loosely organised, not too homogeneous material, which the researchers must be able to consult in extenso, in some electronic format – that is, on screen –, but which they shall, of course, not be able to modify.

Bearing this in mind, both institutions came by different ways to the conclusion that a double preservation is necessary, related to distinct modalities of accessing and researching in these materials:

♦ On the one hand, preserving the raw material of these files with their defective organisation just as we received them, in their original disorder, and in their original AutoCad format, to be now only migrated to the newest available version. Later on, the migration process will have to be repeated, with the risk not to do it in time at a given moment, and therefore the assumption that this raw material may not be long-term preserved. One of the uses of this version (as long as it holds) is the possibility of a ‘sophisticated research,’ which the IUAV has formerly identified as one it will provide. Another use, if we consider it at all useful and meaningful, is that it will be more likely to retain some integrity than any other version.

♦ On the other hand, for current research, we will have to reorganise the files, make some choices and – perhaps – convert the documents in specific consultation formats, which may exclude some of the typical CAD software possibilities: thus, this should be a multi-scale selection process. The Archivio Progetti thinks that some viewers available on the market could perhaps be an efficient filter to access AutoCad files without being able to modify them, but still retaining large possibilities of using the CAD functions.

♦ (Besides these two versions, a third probable step is to create thumbnails, or miniatures, from some of the files, designed for first-stage viewing, in whatsoever sustainable format, PDF or JPG, just as we already do for scanned paper documents.)
Towards static images?

If we get deeper into the files – and still speaking quite basically –, the layers structure of AutoCad allows to distribute the information born by a given drawing into different levels, and to select some of them at the moment one wishes to print. A single document thus allows for a number of printed versions (or visions on screen), which are just as many ‘presentations,’ varying in many aspects but namely in scale. Since its 2002 release, AutoCad makes possible to keep the memory of these presentations; many will of course be found in the firm’s printed archives; but many more can be imagined which have actually been neither recorded nor printed.
Which format is best suitable to preserve on the long term AutoCad files?
In its previously mentioned survey, the Art Institute of Chicago advocates a conversion to PDF or PDF/A files, the latter being a specification of the format limited to its main functions and therefore expected to be more broadly readable and thus more sustainable. Although not a free format, PDF has however practically become a standard in recent years. However, PDF is not very suitable for CAD files since it does not include this layers structure but only permits the preservation of an image, of a given ‘presentation.’ You have to convert an AutoCad file to as many PDF files as how many different presentations you wish to preserve. There is a specific format for engineering documents in preparation, PDF/E, for which an ISO standard should soon be published, and which should give a possibility of layers structuration, but it is too soon to say if it may be used for AutoCad preservation. Other possible formats, existing but whose sustainability and readability have not yet been checked (at least by us), are SVG and DXF: the latter is a proprietary file exchange format used by architects, supposed to be short of graphic possibilities; the former, SVG is a layer-organised, free format readable with Firefox viewers, and which the IFA could decide to use for preserving its CAD files.

Still another point: up to the 2000 release of AutoCad, a file needed, to be printed, a secondary file containing the ‘pens’ specifications (colour, thickness, etc.). These files, with a specific .pcp extension, were often stored on the hard disc of each individual computer, and not on the server, when there was one; they have often not been preserved along with the files they permitted to print. An architect who knows how the firm used to work may be able to broadly reconstruct the
printing conventions. We could also consider – as the Archivio Progetti does – that this printing information is accessory, and that its loss is not relevant to access to or to understand the drawing.

Conversely, other secondary files contain ‘references,’ that is to say recurrent elements such as the cartouches or pieces of furniture. A CAD file, when opening or printing, will automatically look for those elements by activating the ‘reference files’ (which have, just as the main file, a .dwg extension), provided that it knows the path to these files. If the tree structure happens to be modified, those files are at risk of being lost; the only way to attach them forever to a ‘master’ file is including them to it manually, one by one.

We therefore feel, at the beginning of the process on the Riboulet archive, that if we are to convert the CAD files into PDF, incorporate in them the reference files, and recreate pen files to print them, the process can be lengthy and request the skill of an architect well aware of how the firm used to work. Our case study will involve just the architect who was in charge of the computer network within the firm, but it is clear that he will be able to process only three or four out of the forty projects or so. This suggests a rather strong selection of elements to be preserved—but, on the other hand, this selection shall also constitute the whole ‘Riboulet digital archive’ which a researcher will be given access to... There is here an equation to solve. There is also the question of how much time is needed for processing one archive, supposing we are done with this exploratory phase.

Finally, there is an access issue. Both at the IUAV and at the IFA, access will be possible through the database in which inventories of the archives are made. At the IUAV the access will be at the document level. At the IFA, most documents should rather be described at the document group level – as would a roll of tracing paper be, for example –, which in turn, we think, could be the key access to the directory (of one building phase of a project, for instance); there the various files it contains could be manually opened. This is a point still under discussion.

An international symposium in 2007

These six case studies are as many attempts at processing digital archives and making them accessible, or at improving creation and preservation conditions within firms. They should be summed up so as to give new information available on the Gau:di/ArchitectureArchives website around the end of the three-year cycle, in 2008.

In the meantime, an international conference will be organised, which we hope you will attend, and also enrich by your own experiences. Its provisory title is: Architecture in the Digital Age: an Issue of Memory. It will also
be an opportunity to hear members of architects practices and software specialists. It is planned to take place in Paris, probably from 8-10 November 2007. The whole Gau:di group on Archives therefore invites all ICAM members to this symposium, also an opportunity to discover the new Cité de l’architecture et du patrimoine, which is to open gradually between late 2006 and then; and also to discover the French Institut national d’histoire de l’art, which should host one of the sessions since fostering international research in the field of recent architecture history fully belongs to its missions. Whether in paper or electronic format, the proceedings should be published the following year.