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The Conway Database and Digitising Project

An Interactive Qualifying Project Report

submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

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Degree of Bachelor of Science

by

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Abstract

The Conway Library wished to open their collection of photographs of art and architecture to the entire academic world. They employed us to help them design and create a prototype web-accessible interface that would allow their collection to be accessed globally by anyone with access to the Internet. We accomplished this goal by refining the existing databases, adding digitised images, designing and producing a fully functional web site, and compiling a user manual for the staff to use.

Executive Summary

The main goal of this project was to allow the academic world to access the Conway Library's collection through the Internet. By conducting interviews with the Conway staff, the students who use it, and some potential users, we were able to obtain information about how an effective system should operate. This information was used during the refinement of the databases, the construction of the searching method and the development of the website. With all these data guiding our work, the prototype of the Digital Conway system was built.

The Conway Library staff was familiar with the evident advantages that online galleries had to offer. Having the Conway collection available over the Internet would allow users to access their holdings from anywhere at any time. It was not until the Conway Library had received suitable donations and grants that it was possible to initiate the digitising and cataloguing of their collection. Motivated by the possibility of receiving a large grant from the New Opportunities Fund (NOF), the Conway was eager to begin the development of an online catalogue of their collection, building on the significant database cataloguing that had been done in years past. In order to begin this long process of placing their collection safely on the World Wide Web, they needed technical support. Our group was this support. We were engaged by the Conway Library to help resolve the technical problems that they were having with the development of the database as well as to provide the proper analysis of what was needed to create the a user-friendly web-based interface.

Throughout the seven-week period that we worked with the Conway Library we focused on developing the best possible Internet presentation of the digitised portion of their collection. We were faced with a difficult task. We were the first group to tackle the problem and found ourselves overwhelmed with possible goals for the web site. Eventually the task list was divided into objectives we would carry out and objectives we would recommend be carried out by later groups.

In order to assure that we were building an interface solely for the potential users, we conducted interviews throughout the project in order to obtain information on the website. We conducted interviews during the seven-week preparation period in Worcester as well as in the seven weeks we were in London. The interviews were held with individuals from various parts of the academic world; teachers, students, historians, and Conway staff.

First, before any other progress could be made on the development of the Conway's online interface, all of the existing databases needed to be refined. Those databases already in existence had evolved over a number of years. In order to make these databases suitable for the web, not only did we have to work out any of the problems the staff of the Conway had with the FileMaker software package they were using, but we also needed to standardize the way the databases were constructed. Standardisation of the databases not only made the databases more efficient to search, but also gave the Conway a set way to catalogue the different collections held within its library.

Once the databases were refined, work on the search pages of the web site could be undertaken. A major source of inspiration for the way that this part of the project was

developed came from the interviews that we conducted with Conway users and potential

users. From these interviews, the team was able to take into consideration each

individual's insights, needs, and desires. These data helped us develop what we felt was

the best culmination of ideas. The resulting product was both an Intranet and Internet

search, in which the Internet site contained both a keyword and detailed search option.

We have also provided the Conway Library with a professional-looking prototype

of their new web page. We again looked to the insights of the Conway's potential user-

base to aid us in the development of the site. Based on the feedback we received, we

designed a very simple and easy to navigate web site, and had it previewed by members

of the Courtauld Institute of Art staff. Individuals such as Eva Bensasson, web master at

the Courtauld Institute of Art, made sure that the web site's layout and presentation

would be consistent with that of the Courtauld. This was very important because when

the Conway site is placed on the web it will be accessed through the Courtauld's web

site.

In order to complete our task, we needed to add the digital images to the

database and make them accessible over the World Wide Web. The first step in this

process was to resize and lessen the quality of the images. The resizing of the images

was done in order to allow faster loading times. The change in the image quality was

done to overcome copyright problems. The actual method that we used to link the digital

images to the database was different from our original intentions. Originally the images

were going to be placed in the database along with their catalogue entry. We changed

our method for two reasons. The most important factor that caused us to rethink our

strategy was complications with the FileMaker software. The FileMaker 5.0 manual

states that the software has the ability to link digital images to the database. This was not as easy as we thought it would be. The software could in fact link images to the database, but this was done for each individual image and could be very time consuming. We had no way to automate the process for a large number of images. Also, another complication is that the large file size of the digital images would greatly decrease the efficiency of the database search function and general operation. We decided it would be best to link these images with their relevant data through the web site itself. This process solved both of the above-mentioned problems with ease.

We understand that there is still much that could be done with Conway's web-based interface but we completed all that was reasonable to do so in the allotted time. No task or idea was forgotten, however, and we made certain to write out in detail any idea or task that we felt would improve the quality of the Conway online collection. As a first WPI project group to work at the Conway Library, we discovered many topics that our work touched upon and that could comprise entirely new projects. These items are detailed in the Recommendation chapter of our project report.
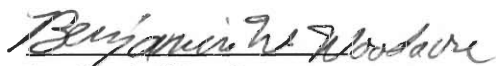
We have also put together a user manual for the maintenance and upkeep of the separate components of the database and digital image link. This manual includes all of the steps necessary to add new images along with their accompanying catalogues to the interface as well as any other information that could prove useful. This, much like the recommendation section, was developed with the Conway Library staff and other groups in mind.

By completing all of the above-mentioned tasks we have developed a working prototype of what can viewed as the first step down a long road to the completion of the
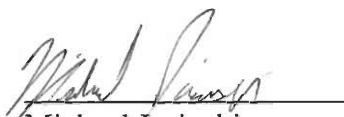
Conway Library's user-friendly Internet-based online-collection. Our work could be used in proposals for further funding for the completion of the cataloguing and digitising of the Conway's holdings. We believe that by working with the Conway's potential user base and by using our technological knowledge, we have created a means to grant global access to a truly unsurpassed educational resource.
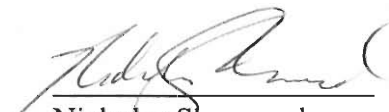
Authorship Page

This project focused on the development of a website interface for the Conway Library's holdings as well as the production of this report. The report was one that required a great deal of work both during and after work hours. The material presented in this report is our original work and was created by the submission of equal contributions by each of the four members of this group.

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1.0 Introduction

Over the last decade a new form of museum has emerged. Online museums and galleries take advantage of the Internet's almost limitless format options for electronic presentation and ability to fashion in-depth presentations. The constraints of geographic location are greatly lessened as Internet-based museums and galleries are developed for collections all over the world. It is for this reason that the Conway Library has engaged us to design and create a way to access their collection by means of the Internet.

The Conway Library is a magnificent research collection of images of architecture, architectural drawings and publications, sculpture, manuscripts, metalwork, ivories, seals, stained glass, wall paintings, panel-paintings, and textiles. The images consist of photographs as well as clippings taken from various printed sources over the years. The collection itself covers a large time period, ranging from the medieval period through to the present day. The collection currently numbers just under one million images and is used by students and scholars from all over the world. For the last ten years however, new acquisitions in the manuscripts and the medieval sections have been catalogued on several databases.

Before we began our project, only a small portion of the Conway's collection had been catalogued in databases, and they were not accessible to the outside world. When we arrived at the Conway Library there were two databases in existence, 'archibri' and 'manuscri' as the files are named. The Archibri database catalogued images of various architecture and sculpture from all over the world whereas the manuscri database contained only images taken from medieval manuscripts. It was envisioned by the staff

at the Conway that the entire Conway holdings would eventually be catalogued on computer, and that this catalogue would be available on the World Wide Web in conjunction with digitised images of all of Conway's holdings. It is the Conway's intention to digitise and catalogue its material, one collection at a time, and make it available on the Internet as the collections are completed. As the first group to work on this project, it was our job to begin with the first set of images to be digitised: some 500 19th century photographs of Rome. According to Dr. Lindy Grant, the active Conway Librarian, the Conway is currently at a stage where concentrated technical expertise is needed. Throughout our project we supplied this expertise.

In order to complete this project, we dealt with many specific objectives. Although a database was already being used, it required substantial refining. Once this happened, it had to be linked to the digitised image files. These two portions of the project were the most difficult, as well as most time consuming and were the primary focus of the project.

We also needed to design a user-friendly, web-based interface. This design required us to take into account not only the present core users, largely from the academic world, but also potential users from outside of this group. It was the key aim of the cataloguing and digitising project to make the Conway's resources available on the Internet to anyone who desired access.

Although the project was carried out in small intervals by developing one collection at a time, the design process had to account for the Conway collection as a whole. Our goal was not to create accessibility to the entire Conway collection at this time, but rather to complete a small portion of it and to create a manual that would allow

anyone employed by the Conway to continue its upgrade after our departure. In turn, this required us to anticipate any possible future technical problems and offer potential solutions to them should they arise.

This project was assigned to us as an Interactive Qualifying Project (IQP), a degree requirement of Worcester Polytechnic Institute. To fulfil the requirements of an IQP, our group needed to examine the ways in which science and technology interact with societal structures and values. By creating a web-based interface for the Conway Library we opened its doors to the entire educational world. Until now, only scholars who came to visit the Library in London could use this vast resource. By means of this project we allowed a whole new audience to view what the Conway had to offer.

In order to provide the most user-friendly interface we had to obtain feedback from the Conway collection's primary users during the construction of the interface. Their primary users are art historians, medievalists, architects, or any other person who would be interested in the Conway's holdings for educational purposes. We also needed to consider the needs of school children. Although they are not presently primary users of the Conway Library, they very well could be somewhere in the near future. Placing the Conway's collection on the Internet would result in a much wider use of the Conway's holdings. This new group of users would most definitely include school children. It was our goal to use both the technological and societal aspects of this project to successfully fulfil the goals of the Conway Library and of the Interactive Qualifying Project.

2.0 Background

This section of the project provides an overview of the background information necessary for our project. Included is information about the Conway Library, the museums and galleries already on the Internet, as well as the appropriate databases, the fundamentals of web design, and the previous Worcester Polytechnic Institute projects that share similarities with the Conway database project. In addition to these topics, we covered information on the average person's knowledge of computers in order to understand to what technical level we could design our web-based user interface.

2.1 The Conway Library

The Conway Library is part of The Courtauld Institute of Art located in London, England (Bilson, 2000). It is a research collection of images of architecture, sculpture, and medieval painting. The time frame covered by the different art forms extends from the medieval period through to present day. Currently, the Conway Library contains approximately one million photographic images. During its seventy-five years of existence, the Conway Library has built up its collection through donations and purchases of original photographs. The Conway has also initiated much of its own photography with the help of in-house photographers and graduate students. Students and scholars from both Britain and abroad use the Conway Library, which is in effect a primary

research resource. Images from the Conway are regularly used for illustrations for books, seminars and lectures.

For the last decade, new acquisitions in the manuscripts and medieval sections have been catalogued on databases (Bilson, 2000). Originally created on the software program dBase III, the databases were transferred to FileMaker Pro 4.1 because of its more flexible approach to cataloguing. During our time at the Conway Library we upgraded the database software to FileMaker Pro 5.0. This upgrade would allow for fewer problems in the long-term development of the project, especially in view of the fact that it is intended that the entire library will eventually be catalogued on the database.

2.2   Museums and Galleries on the Internet

Internet galleries were not always as abundant as they are today. Actually, it was not long ago that they were almost non-existent. As Joe Ryan (1995, p. 80) states, "Museums and galleries have always been repositories of information and objects, as well as active preservers, disseminators, educators, and promoters of both culture and science." This is very true, but how helpful would a museum or gallery be to a researcher located on the other side of the world? Internet museums and galleries are not limited by the same constraints that actual museums or galleries experience (Ryan, 1995, p. 80). To put it simply it would be nothing short of an expensive plane ride, several train tickets and a six-month hotel stay for an art historian from Massachusetts to use the Conway Library to its fullest potential. It is for this reason that there has been such a large increase in the number of galleries placed on the Internet within the past ten years

Internet galleries are very valuable to the academic world because they can provide images that might otherwise only be seen in the galleries themselves or in textbooks or on slides (Blumenstyk, 1998, p.198). By putting these images in an electronic format they will be easier to receive as well as easier to manipulate for a paper or presentation.

There are indeed flaws in Internet galleries and museums. The making of these on-line galleries does require some technical skill, computer knowledge, and can be very expensive in some cases. The reasons that museums and galleries have emerged all over the World Wide Web is because the advantages seem to greatly outweigh the disadvantages. As Marilyn Lavin (1997, p.198) states, "Art historians now understand that databases, electronic bibliographies, storage and retrieval, and high quality digital images may be complicated and expensive to create, and often to use, but are larger, faster, and more reliable forms of what we want and need to carry out our work." It is for these exact reasons that we carried out a complete study of the factors that come into consideration when making and designing an online museum or gallery.

2.3   Copyright & Digitisation

At the moment, the process for obtaining photographs at the Conway currently involves searching through numbered boxes, sometimes at length, for suitable images. Once located, the searcher can then examine the photograph and, if it exists, the negative and possibly make a copy for him or herself. However, the reproduction of images is subject to intellectual property and copyright law.

Copyright is a statutory privilege extended to creators of works that gives the creator control over how the work is used by the world (Reed, 1987, p.2). Its purpose is to protect intellectual ownership (Butterworth, 1998, p.188). Copyright does not usually restrict one from looking at a copyrighted photograph, citing a copyrighted source, or gaining access to a copyrighted work; but copyright does restrict the ability to reproduce or disseminate a work. This restriction is often at the discretion of the copyright holder who has the exclusive rights to use the work as he or she sees fit. So when an individual at the Conway wishes to obtain a copy of a photograph from a negative in its holdings, the identity of the copyright holder must be established.

The Conway Library itself holds many copyrights on a large body of the photographs in its collection. Among photographs the Conway holds, approximately one half of the portion of the collection originating from Britain and France and one third of the collection from Germany are copyrighted by the Conway. The remaining portions are copyrighted by whoever owns the specific photograph.

The advent of digital technology has created many new ways of working with copyrighted material. Documents that are delicate and rare have the problem of accessibility; access is either restricted in order to keep physically fragile works preserved, or limited by location. Digitisation can solve both of these problems by providing high quality representation of works as well as greater access. This all-encompassing access is easily achieved because electronic reproduction of digital media is very cost effective; digital media can be copied without any loss in time or quality (Butterworth, 1998, p.49).

Digital technology does have its share of problems as well. Although it does enable the preservation of works that might be lost in the future, it also enables mass reproduction of works without the consent of the copyright holder. It will be necessary for the Conway to employ technologies in conjunction with the digitised images to protect the rights of copyright holders while still providing easy access to its collection over the Internet. Although it had been established that our project would not consider copyright issues due to the fact we were only working with images in which the Conway holds the copyright (Dr. Lindy Grant, personal communication, December 1, 2000), it is nevertheless an issue that must be taken into account when the "Digital Conway" grows to maturity.

2.4   Databases

A database or database management system (DBMS) is a method of organizing some quantity of data in a systematic and organized way. Two basic purposes of using a DBMS are mentioned by Pullman (1988, p.2). First, a DBMS is used to contain vast amounts of constantly changing data, and secondly, they allow a user to access these data easily, efficiently, and overall very quickly. This is possible because the database is managed by a single file structure, which can be optimised by the programmer (Martin, 1985, p.234). There are other various points about a DBMS that make it very practical, such as horizontal integration (Martin, 1985, p.2), the ability for one database to be accessed simultaneously from more than one location at one time. Entrance from more

than one location also develops the need for a networking structure in the computer system.

Databases come in all shapes and sizes and thus each has to be considered separately in its features and methods of organisation. One of the more useful forms of a DBMS is an object-based system (OO-DBMS) (Ullman, 1988, p. 21). This special database system allows for different "languages" to be used as definitions in the system. For example, in our project it was clear that images needed to be integrated into the database alongside the text. An image is a special type of object that requires definition according to a "language" so that it may be read by any program. An OO-DBMS can access various "languages" from the operating system and implement different types of objects such as sounds, movies, documents and more.

2.5 FileMaker Pro

Currently databases are used in many businesses and organisations. This increase in database use has given rise to many database programs that make database creation and management significantly easier for the user. Programming is no longer a necessity for a standard database; however it may be used to customise the layout and structure of the database thereafter. Two of the most used programs are Microsoft Access and FileMaker Pro, the latter being the one currently used in the Conway Library.

Hester (1998, p.4) suggests FileMaker is one of the favourites because of its well-developed interface, its cross-platform consistency, and the recent ability (available in versions 4 and 5 of the software) to link directly to the Internet. Another important

concern in dealing with databases is that eventually when they grow large enough, they might need to be divided into multiple small variations of themselves to resolve problems like storage space limits or differences in the record style; Hester (1998, p.12) calls them relational databases. "Portals" (Hester, 1998, p.196) in FileMaker serve as useful features to link multiple relational databases together seamlessly. "Portals" allow one database to access another, thus forming a large, more complete database system. Relational databases might span various files, but larger database systems might encompass multiple computers linked together through some networking structure.

2.7   Web Design

With large amounts of information contained in databases on networks, a means of distributing it is necessary. The most common way is to use web sites accessible over the Internet. However, with the vast number of web sites on the Internet, making the web interface professional is vital to having the information within it considered valid.

In designing a professional website, there are a few aspects of the design that need special consideration. Two areas that require close attention are the organisation of the site's layout and the design techniques used in its creation. Focusing on these two areas of web design allows easy navigation and a unique appearance.

The layout of the site should be organised and designed so that users of all skill levels can utilise the information on the site (Lynch & Horton, 1997). To make the site easy to use, there are a few goals that need to be accomplished before it is designed. The goals are: (1) to identify the audience that uses the site; (2) to define the purpose of the

website and how it is to be used; (3) to know the objectives of the site and what it will accomplish; and (4) to create an outline of the information that is contained in the site. By accomplishing these goals, the site's design becomes more efficient and conveys a sense of direction from the beginning stages of its construction.

One of the most important parts of a website is its home page. The home page is typically what the users will see first, so it should provide a good layout of the entire website's content. If the website's resources are not immediately evident, visitors might become frustrated or leave the site entirely.

While the home page describes the purpose of the website, it is also important that the home page might not always be the first facet of the site that a user will visit (Lynch & Horton, 1997). A user might be linked directly to a subsection of the website and not see the home page, which may result in a less than complete understanding of its objectives. At least one link on each page to the home page would ensure that every user can return to the home page, and there would not be any dead ends in the website, which can be frustrating to users.

Another significant design aspect is the functional stability of the site (Lynch & Horton, 1997). The functional stability is keeping the interactive parts of the site working reliably. There are two parts to functional stability--getting all the elements right the first time and keeping everything functioning smoothly over time. Making sure functional stability exists mainly involves periodically checking on all of the internal and external links to see if they are working.

Web design is a process in which the only limit to the appearance of a page is the creator's imagination (Mackenzie, 1998). However, some developers put too much into a

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site by excessive use of graphics, web effects, frames and background images. The abundant use of these extra features can make a page look cluttered and hard to navigate. To avoid overdoing the website it is important to put the layout and the design first and only use the special effects when they help complement what is already on the page.

The overuse of web effects is directly related with the size of the page as well (Mackenzie, 1998). To minimise the loading time of the page, the size should not exceed 50 kilobytes. Minimising the loading time may mean having to exclude unnecessary web effects. To keep down the size of a page, it is vital to follow current HTML standards. These standards also help to assure that a large audience with different browsers will not lose the appearance and intent of the website.

2.8   Previous Projects

In researching our project, it was helpful to review previously completed student Interactive Qualifying Projects (IQPs) with goals similar to ours. Similar projects help us to follow by example the previous work of other groups, providing a guide to what is attainable and what is not within the time constraints of an IQP. Researched projects had at least one facet similar to our IQP, either in the area of web design or database construction, yet although the reasons for the creation of a particular web site or database might differ from our own project, the methodologies to produce them are similar.

An important portion of our project was the evaluation of the current database that the Conway possesses. To get an idea of where to start and what to consider, we reviewed the methods and ideas used in previous IQPs dealing with databases. From our research,

we discovered that there is no single approach to completing a task, such as refining a database. "Enhancement of Information Systems at the IITF" (Fay, T.S., et al., 1998) and "Information Management at the Palazzo Ducale" (Cooper, J.L., et al., 1999) are examples of databases that were created from scratch. When designing from scratch, a plan of how information should be organised is essential to have an effective and easy to access database. Another example of database design is found in "Utilizing Modern Technologies at Chris Morin's FitTec", (Condit and Philos-Jensen, 1997) in which a database using FileMaker Pro, the database software package we used while in London, was created in order to track client fitness records. Our project requires us to consider the current Conway database and evaluate its organisation and accessibility. The FitTec database gave us some good insight as to possible database solutions.

Another goal of our project was to build an easy-to-access web gateway that would integrate the Conway's database with its cache of digitised images. In order to accomplish this goal, planning was required before any significant tasks could be completed. We also reviewed past IQPs for examples of how to manage the task of researching, planning, and implementing a website, which was in some cases the main task of the IQP. The "IITF at the IITF" (Bourgeois, J., et al., 1997) is a good example of the research and planning that goes into creating a web page, as the main goal of the project group was to give the IITF's significant resources and services a presence on the World Wide Web.

2.9   Interviewing Procedure

A major part of our project was to conduct interviews with people directly involved in academic life. By interviewing potential and current users of the Conway library's collection we could more easily complete our goal. From these interviews we discovered the needs and desires that potential academic users have for an online archive such as the Conway.

Our group decided it would be best to use a semi-standardised interviewing structure and then practice it during our preparation time in Worcester. We employed a simple, open-ended interview that had only a few questions, but was mainly left open to go in any direction. In some instances, we only asked one or two of the predetermined questions. This allowed us to apply the interview to any Conway user we might encounter. The list of questions used during the interviews can be found in Appendix B.

As already mentioned, the interviews contained only a small number of set questions. The information that we received from these questions was intended to help us develop our online archive for the Conway and make it as simple to use as possible. The major questions asked dealt with users' familiarity with the Internet, their likes and dislikes of existing digital galleries, and what they would like to see done with the Conway Library's database. The questions used were intended to retrieve key pieces of information for the development of the web-based interface.

In order to create the best interviewing procedure possible we needed to decide what questions would be important to our project, but also we needed to test the procedure in order to find its faults. Testing the interviewing procedure allowed us to develop the method that would be most productive when we conducted interviews in London. The following three members of the academic world were interviewed before we departed from Worcester: Professor Miles Samson, Humanities and Arts department at Worcester Polytechnic Institute; Professor Lee Fontanella, Humanities and Arts department head at Worcester Polytechnic Institute, and Professor Peter Ferguson, professor of architecture at Wellesly College.

The test interviews that we carried out on the above mentioned individuals were very informative. The individuals gave similar responses to all of the predetermined questions asked. We also found that leaving the interview in a semi-standardised form was very useful. More detail concerning the interview questions and the answers given by the above-mentioned individuals can be found in Appendix B.

By using the information that was conducted in these test interviews, a very basic idea about how the interface should operate was obtained. A common suggestion that was made from the test subjects was that the interface should be primarily educational rather than entertaining. Professor Samson expressed that too often, information on the Internet is discredited because of the appearance of the page. Since these interviews were conducted with potential users of the Conway, this suggestion was highly valued when designing our interface.

Another area in which the individuals being interviewed gave suggestions was navigating and searching websites. The individuals expressed that at times, finding

information on a website is often rather difficult and frustrating. This complaint was very important to our project, as our ultimate goal is to distribute the information contained in the Conway's collection over the Internet. These data obtained helped to stress the importance of the accessibility and usability of our interface.

2.9   Courtauld Institute NOF Bid

Upon the team's arrival in London, we were familiarised with the Courtauld's technical staff and resources. We met with individuals involved with ongoing and proposed technology initiatives within the Institute in the fields of digitisation and information architecture. It was in one of these interviews that we met Thomas Bilson, Head of Digital Media, Courtauld Institute.

Thomas Bilson familiarised us with the Courtauld's bid, entitled *Art and Architecture* (A&A), to the UK's New Opportunities Fund (NOF), a national fund that award grants to health, education and environment projects throughout the UK (New Opportunitues Fund, 2001). The goal of the proposal is to secure NOF funding for the creation of a digital reference library of Western Art and Architecture for the UK's learning community. (Bilson, 2001). If accepted, the Courtauld hopes to establish an in-house digitisation centre to handle the digitisation of 150,000 images, including renowned paintings, drawings, and 100,000 images from the Conway Library over a three-year timetable, starting in July 2001.

When complete, A&A will accessible free of charge through a website, enabling widespread access across the UK and the world (Bilson, 2001). The website will not only be focused towards scholars and students who work and study at the Courtauld Institute of Art, but it will support challenging uses beyond the History of Art to learners and their teachers of all ages.

Because of the large involvement of the Courtauld's A&A proposal with Conway photographs, our work will be a start towards the goals of A&A. By using the prototype system we will build, the team hopes that the Conway Library and Courtauld Institute will have a better understanding of the work that goes into developing a digital library and how to develop its presentation to a wide audience.

3.0 Methodology

This chapter describes the procedures that we followed in order to complete our project's objectives. As previously stated, the ultimate goal of our project was to make a portion of the Conway Library's collection accessible over the Internet. In order to do this, we carried out a number of objectives to reach our final product. Included in this section are procedures for interviewing potential users, creating and refining the database, linking the digital images, networking the separate databases, and designing the web page procedure. By completing each of the tasks, we were able to have a prototype version of the Conway's web-based front end ready for use by the time we departed from London.

3.1 Databases

The creation of a database and website interface for a large collection such as the Conway Library's one million images immediately presents various dilemmas. The extensive size of this library defined first and foremost how the database was constructed. The wide use of the Conway's collections, within or outside of the library, produced a need for this extensive index to be available to a large audience. The anticipated size of the user base determined the Conway Library's need for a networking strategy to provide multiple-user accessibility. Finally, human ability to interact with digital media created a need to provide Conway with a user-friendly entry to the ample and complex database.

The Conway Library is a holding place for many collections of thousands of works each, yet only two databases corresponding to the architecture (archibri) and medieval manuscripts (manuscri) archives had been created when we first arrived in London. Furthermore, the databases' content is only descriptive information of either the photographs or documents; they do not contain any photographic representation of any of the works. Our group used the existing databases as a foundation from which to build the Conway's online collection. Some refinements were made on the two databases in the beginning of the project. This was done in order to standardise the database, thus making them easier to fill in or build new databases as the project progressed.

Each of the collections in the Conway Library requires its own database with descriptive fields pertinent to each particular division of subject matter. The existing databases were linked together with each other to represent the wide range of source material available at the library. We mainly dealt with the Conway's nineteenth century Roman collection. For each piece in the Roman collection there is a link to its image representation. Before we arrived in London we anticipated that the Conway would have an organisational system from which we would use most of their descriptive methods, for example: Negative Number, Date, Iconography, etc. Most of the description fields were self-explanatory, but not all were necessary. The indexing method could be streamlined by using fewer fields in the database. Examples of this were the first databases created by Dr. Grant, which had two separate fields for iconography, a primary field and a secondary field. We discovered that these fields could be combined and would still serve the same purpose. This, as well as other small refinements, helped to minimise the number of fields the database needed to have while at the same time made it more

efficient to use. Although we were not responsible for making a database for each of the collections currently at the Conway, we did set a standard for them based on the four databases we worked with. From this standard that includes a set of basic layouts and a base set of fields, we created template databases for the Conway's use in new cataloguing in the future.

Additional fields or modifications on current methods of description were one of the topics discussed with potential end users of the Conway Library during the preparation phase of the project. In addition to these preparatory interviews, interviews with artwork and cataloguing experts were also carried out during our time in London in order to produce necessary information on the subject. What we acquired from these particular interviews was how the user directly or indirectly interacts with an indexing method such as a database. Particularly, we wanted to learn what they disliked about current cataloguing systems. If we were looking for photographs of the Arc de Triomphe, could we search for "French structure" to find it, or would we have to spell out the name?

We have left the details of our interviewing procedure for the interviewing section of our methodology.

3.2   FileMaker Pro

The databases at the Conway used FileMaker Pro 4.1 as the development software when we arrived in London. One of the first steps we carried out in respect to the databases was to upgrade to FileMaker Pro 5.0. We conducted various tests to evaluate FileMaker software during the preparation phase of our project to determine the overall

utility of the product for this specific project. We also made a compilation of outside documentation describing the software's features and methods of implementation as an additional reference. This outside documentation was intended to help us prepare for any challenges using the software we might have found. Furthermore, it helped us familiarise ourselves with the operations of the program in general.

FileMaker Pro was beneficial for this project because contained in this software package is the ability to link digital images to a database and to make the database accessible over the Internet. These were two goals we needed to accomplish in order to complete our project. By working with a software package with these capabilities already set up for use and with the user manual, we greatly lessened the amount of preparation work needed.

3.3   Networking

In order to provide accessibility of the electronic collection within the library or eventually through the Internet we had to consider how our work would physically access the Internet. Originally, we were unsure what networking resources were available within the Conway Library, but we later found that the Conway is connected to the Internet through the King's College network. For our project, this network connection was more than suitable. Throughout the time we spent developing the online archive we had set up our computer as the main server. Other users could access this server simply by using a computer linked to the King's College network. In terms of the long-term

project, the Conway may need to consider other networking options due to the large size that their digital collection could grow to in the future.

3.4 Website Front-End

Designing how one would access to the Digital Conway, most of all, required extensive planning. The website front-end to the Conway database project needed to be in all aspects, professional. It required a thorough layout that would place the electronic collection at their disposal, as well as an intuitively easy-to-use design.

Before construction of the website began, the four goals stated in the literature review for web design were fulfilled: we had to identify the audience, single out the real purpose of the site, delineate the different objectives of the site, and finally outline the information that was to be placed on the web site. Completing these goals helped us to more thoroughly plan out the site. This plan in turn allowed us to make navigating and locating necessary information as simple as possible.

The first goal, to identify the audience, was most useful when applied to the primary users of the Conway system: the academic world. By finding out how the end-users of this project would use the system, we could make a more accurate and trouble-free searching method. In order to complete this goal we carried out many interviews with people whom we regarded as potential users of the website we were making.

The second and third goals, knowing the purpose and objectives of the site, aided us in developing the actual website. In order to determine the purpose and objectives of the site our group once again turned to interviews. This time we interviewed mostly

employees of the Conway. From the feedback they gave us, we determined just what was the actual purpose and objectives of the site. Its main purpose of functioning as a portal to the actual database lead us to believe that many of the frills of web design could be avoided so that the information could be delivered as quickly as possible to the end-users.

The fourth and final goal, to outline the information, was probably the most important for our site. There was always the possibility of new users and occasional web navigators frequenting the site every day. Because of this possibility we included an online instruction guide of how to access the database. While the visitors will primarily be searching the database for data regarding the actual works held by the Conway, other information such as a map of the site, which easily shows how to navigate the site, needed to be presented so that users would not get lost.

By doing this preliminary planning, we could be more efficient and effective in the construction of the web site. To help design the site, we carefully viewed and applied feedback from potential users. We collected feedback both before and during the creation of the interface. However, this information alone was not sufficient to thoroughly complete the layout. We examined existing online catalogues that are similar in content to the Conway's so that our group could obtain a general idea about how a professional online catalogue should appear. One example of an online gallery that we examined was the Getty (J. Paul Getty Trust, 2000). We felt this online gallery was not the type that we would want to model the Conway's collection after. However robust its electronic gallery, its initial page was cluttered with information, and it was very hard to easily navigate around the site. Many times we found ourselves getting lost in the site.

The searching of the gallery's collections was also very difficult. It appeared to us that the Getty had a poor cataloguing system, which resulted in a mediocre searching mechanism. The Getty's setup is something we wanted to avoid emulating. Using these two vital information sources, both navigation and cataloguing, we had a guide when constructing our web interface.

After all these steps were completed, the actual construction of the site began. In order to make the page we used a combination of methods. The site was mainly developed using the web page authoring software, Claris Home Page 3.0. This program was chosen because of its compatibility with the FileMaker software and its ability to quickly create web pages that integrate with FileMaker Pro's web publishing capabilities. Along with this package we used Hypertext Markup Language (HTML) code to create and edit parts of the page ourselves. HTML was used as a supplement for the Claris Home Page software in any instance where we needed a more complex feature. Since HTML is simple and more customisable than web writing programs, the task of thoroughly learning HTML was carried out. An additional language, Claris Dynamic Markup Language (CDML), was also used for the same reasons we decided to use HTML. It is commonly used with the particular FileMaker program to publish FileMaker databases on the web.

From the research and planning of the interface, we constructed a basic, almost skeletal structure of the site. The bare necessities of the site, such as essential links, information, and format, were included. Once our group completed this task, additional features such as a background pattern, a colour scheme, additional pictures, additional

links, a feedback and a help page were added. With all of these features, our group constructed a thorough and ready-to-use web interface.

After we finished all of the above steps, an evaluation of the speed of the site was performed. This included an assessment of the site's ability to accommodate multiple users simultaneously. We used effects, such as animations and illustrations, only in instances where they were appropriate and made the existing site look more professional. While these effects were not necessary, they did add to the appearance and visual continuity of the site when used properly.

3.5   User Manual

As we worked towards each of the above-mentioned objectives, we kept records of the procedures we used in their completion. The team kept records not only for our own purposes of documentation, but to also facilitate the creation of a user manual for the Digital Conway. In describing how we accomplished the different technical objectives of the project in a user manual, we left a means for future groups to reproduce our results. This manual was left with our liaison, Dr. Grant, so that it may be distributed to any persons who continue to work on the database or web site after we leave London.

3.6   Interviews

Up until this section, interviews have only been briefly mentioned throughout this project report. As was earlier stated, the interactions humans have with technology were a primary focus of this project. This section is intended to give an in depth description of the procedure in which we conducted our interviews. We will also discuss the manner in which we used the information gained throughout our interviews to develop our project.

In order to produce the most efficient user-friendly web-based interface for the Conway Library we wanted to structure it primarily on the wants and needs of its users. By using semi-standardised interviewing procedures we were able to obtain feedback as to how we should design this online collection (Berg, 1998, p. 61). First, by conducting several interviews while still in Worcester, we were able to make and refine a template interview that was implemented as soon as we arrived in London. The interviews were carried out with people who we consider potential users of the Conway Library's online collection, mainly those from the academic world.

As was already mentioned, the interviews contained only a handful of set questions and the rest of it left open-ended. The following is a list of the questions each person interviewed was asked.

- How comfortable are you using the Internet?

- Would you like to have the Conway accessible over the World Wide Web?

- In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

- What would be the simplest and most efficient way to search for a general type of image, (e.g. Castles)?

- Is there anything you would like to see incorporated into the Conway's web page?

As stated in the background section of this report, there were some instances where we would not actually ask all of the set questions. In some cases the interviews were set up in order to supply our group with information about some aspect of the project we were developing. If the person we were interviewing was a specialist in a specific field we tended to move away from the set question list and focused mainly on what we the individual had to offer. In cases such as this, we would use the questions as a means to open up conversation.

The names and titles of the people we interviewed can be found in Appendix B; almost every person that we interviewed offered similar answers to the set questions we asked. However, given our semi-standardised interviewing format, we were able to acquire new ideas that aided in the development of our project. Usually the knowledge obtained was dependent on what part of the academic world the individual came from. Examples of how useful the interviews were at obtaining new and original feedback can be found throughout the remainder of this section.

People such as Lindy Grant, Barbara Thompson, and Michael Phipps who are employees of the Conway Library, were very helpful when refining the databases. When we had first examined the databases already in existence we saw many inconsistencies in the entries. Of course we had many of our own ideas on how to refine the databases, but as we found there was a great deal to consider when cataloguing a specific picture. Lindy Grant Barbara Thompson, and Michael Phipps demonstrated to us the actual processes

they use when cataloguing. This allowed us to produce a catalogue that best suited the needs of the Conway Library staff.

Development of a user-friendly web based interface was a huge portion of our project. The user base was a major factor when designing the search page for the interface. In the beginning of the project we were under the impression that this site was being developed for adults in the academic world. After discussing the scope of the project with Lindy Grant, Tom Bilson, and Sue Price we found that we would also need to take into consideration the needs of school children. Talking with Irene Davies, a historian who regularly works with teaching children between the ages of five and thirteen, we were able to gain some insight as to how we might design the interface to suit children as well. She said that simplicity and familiarity of the materials were the keys to successfully teaching children. It was this interview that pushed our group towards the development of two separate search pages; a simple one and a more advanced one. The simple page would be geared more towards a young child's needs. The advanced page would be more useful to scholars who knew more specific information about any certain piece they would be searching for.

The appearance of the website was also a major consideration, and we needed some outside information to help us design it in the best possible manner. Most helpful when designing the Conway's Intranet database was the Courtauld's director of digital media, Tom Bilson. Our group began our design process of the Intranet database by examining similar works that Tom Bilson had been involved with and obtaining his ideas on what we might do. From this interview we were able to design a basic set up and style

for the Conway's Intranet. With his help we determined the proper buttons and pages needed for the database.

When developing the Internet web page we interviewed Eva Bensasson. She is the Courtauld's in-house web manager. We had close interaction with Eva Bensasson throughout the development of the Web page that would host the online interface to the Conway Library collection. She helped us maintain the website's compatibility with the Courtauld's page also gave us some insights as to how we could give the Conway Library its own identity without deviating too greatly from the Courtauld's existing web page layout. This collaboration was very important to our project because the website was going to be placed as a part of the Courtauld website.

By combining all of the above-mentioned procedures of our methodology we were able to complete our ultimate goal of creating an Internet-based, digital version of a portion of the Conway's collection. By completing each of the previously stated objectives we have developed a working model of the Conway Library's online image archive.

4.0 Results and Analysis

This Chapter provides discussion of the results that were obtained from this project. The results were reached by combining the knowledge we had collected from the preparation work at WPI as well as the data obtained from the interviews conducted throughout the entire project. The combination of these two elements provided us with direction as the database system was being developed for the users.

The final prototype of the Digital Conway system is the culmination of this project. The results that were obtained can be divided into six sections: databases, digitised images, searches, website, Intranet site, final testing and user manual. This Chapter contains these seven subsections along with further subdivisions where necessary.

4.1 Databases

As stated earlier, one of our goals was to look into refining all existing databases. This entailed creating a standard method of cataloguing all new entries and updating the old collections. Mainly due to old database software, the staff was not able to catalogue all of the information quite as it should be. For example, a large problem with searching through the old databases (using the old software) was the need to use correct capitalisation in names of buildings and people. Before we began our refinement many entries were typed in all capital letters to simplify finding records. Capitalization,

however, was not standard throughout the full set. We proceeded to standardise the digital catalogues, capitalizing only the first letter of each word and ensuring proper capitalisation on entries such as individuals' names.

These refinements was an easy one to correct on our own, but not all revisions were as simple to remedy. One problem that we encountered was that we had little idea of what was important information to include in the cataloguing system. The Conway Library staff was an ideal resource during this stage of the interface development.

We talked to Lindy Grant, Barbara Thompson, and Michael Phipps, all of whom are responsible for maintaining different collections at the Conway Library. Working with these individuals allowed us to determine information was important for the databases to contain, the standardized format for entering data, and an organized way in which to display the entered data. An example of the information we gained originates from our long interview with Barbara Thompson, who is responsible for maintenance of the manuscripts collection at the Conway. All of the existing databases contained inconsistencies. For example, sometimes a person's name would be entered under three different spellings. Having three different ways for representing a person's name creates a problem when one searches the database. There would be fewer search results because the database software does not recognize those three spellings as the same individual. In some cases, based on the geographic and vernacular origin of the specific item, multiple names would be needed. A possible solution to this problem would be to use an authority file, an added feature that translates the different ways of expressing a name into a standard form. Dr. Grant felt that because authority files were so widely used for similar applications in other parts of the Courtauld, it would be a valuable resource for the

Conway collection as well. We have saved the details of authority files for the Recommendations section of our report.

We also found many variations and inconsistencies in abbreviations, mainly throughout the architecture database, to describe orientation and view of the photographs. The different styles of abbreviation used across a set of entries for a particular database field, possibly a side effect of different individual's cataloguing efforts and time itself, made it difficult for us to correct the inconsistencies across all sixty thousand records. For those inconsistencies that were feasible to repair, we needed the aid of all three members of the staff in order to translate the different abbreviations to one set format.

With the help of the staff we were able to obtain valuable information on what data were necessary to effectively catalogue collections such as those held at the Conway. From this information we were able to develop a standard method of cataloguing for each database.

4.1.1 Architecture & Sculpture Database Analysis

The "Archibri" database contains approximately 27,000 records of photographs of architectural works from around the world. However, this catalogue contains more than just architecture. In fact, a large portion describes a share of the sculpture collection that resides in the Conway, as well as stained glass works and other features that might commonly be found in, or as a part of, architecture.

The main disadvantage of the old database and its software was the limitations on field names and field contents. The limited number of characters available for the

contents of a field made it necessary to have multiple fields to create room for larger amounts of textual information. For example, the architecture description field as we found it was spread across 3 fields named "DESC1", "DESC2" and "DESC3". Using FileMaker Pro, we created a small program, or script, to run within FileMaker that would create a new field within a record containing the contents of the three description fields. This script would start at the first record in the database and continue, automatically through every record in the database, concatenating the three descriptive fields. It would be practically impossible to perform this task manually through approximately 60,000 records.

Various other cleanup tasks were also performed throughout the database. We standardised the proper case of the data and created more descriptive field names to replace those that were cropped or abbreviated in the past. These simple, yet tedious tasks help a great deal in the general interaction between people and the raw data, as well as create a neater medium to work with.
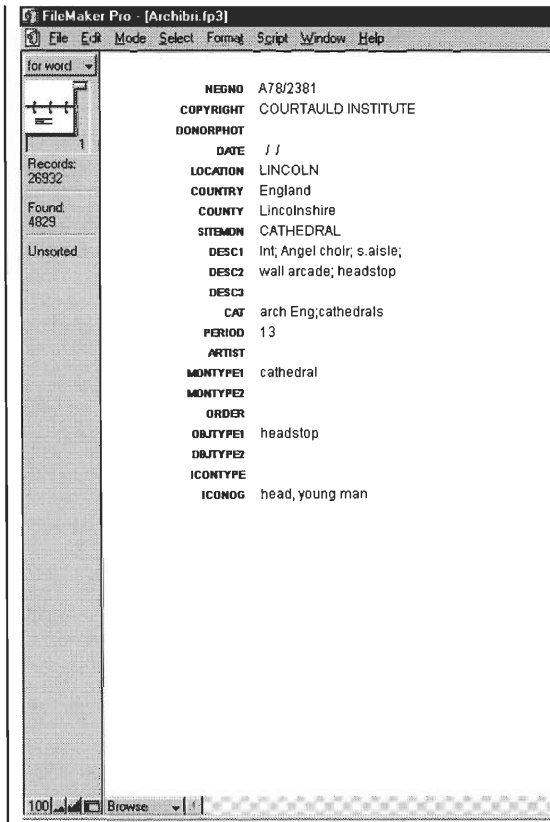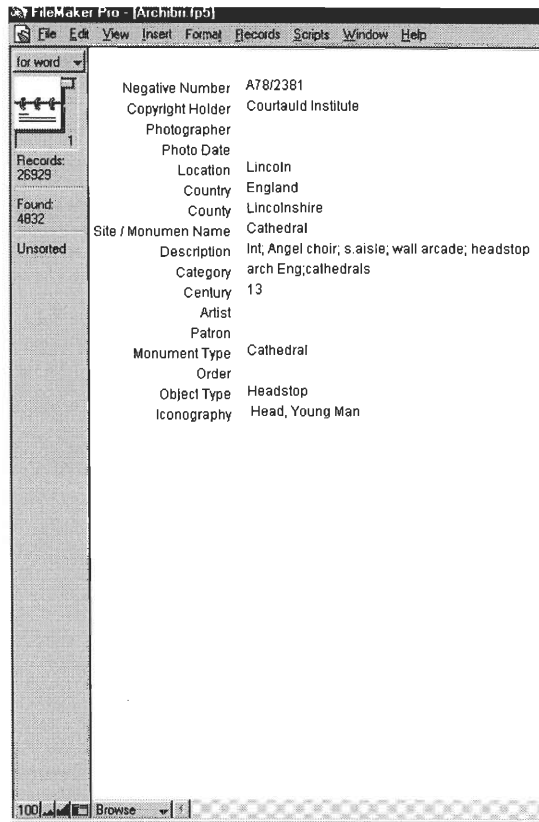
Figure 1: Archibri Database Pre-Refining

Figure 2: Archibri Database Post-Refining

4.1.2 Medieval Manuscripts Database Analysis

The medieval manuscripts database, "Manuscri", contains some 29,000 records. One of the main drawbacks in this database was the use of the negative number field as a text object. The negative number contains three significant numbers, separated by forward slashes and sometimes including text characters to describe where in the roll the image is to be found (e.g. L106/11/3). Without instructions as to how to use it, this piece

of data is completely unintelligible to the computer, and useful functions like sorting by negative numbers, a common practice, cannot be done easily.

In this case we found several variations on the negative number format, which further complicated the task of creating an instruction set for the computer. However, by expressed wishes from the staff, and because this was a traditional numbering scheme, the negative number data were kept original and another solution was agreed upon. To facilitate the ordering of the records by negative number without changing any of the data, we extracted the data to a more versatile spreadsheet software package: Microsoft Excel. Using Excel we manually separated and sorted the data using the Manuscripts numbering system and created a new field in the original database, dubbed 'New_Order', which could be used to sort the records. In addition to the utility of proper record ordering provided by this new field, the field also provides a way by which any record within the database can be uniquely identified. The existence of a field to uniquely identify each record within a database is very important, as some records in the Conway's databases contain little information, and data that are present a majority of the time within records, such as negative numbers, are not necessarily present.

Finally, as with the Architecture database, the general appearance and visual content of the database, including capitalisation and abbreviations, were cleared and standardised.

4.1.3 Historical Photograph Database Analysis

The historical or old photograph collection, "Oldphot", is a record of some of the older 19th century photographs held within the Conway Library. It was created originally with the purpose of cataloguing these older photographs in the Library but was abandoned early on leaving it with 37 records. However, due to its original purpose and construction, Dr. Lindy Grant chose it as the destination for cataloguing the newly digitised 19th Century Roman Photograph collection.

The 'Oldphot' database contained many of the defects previously seen in the two other collections. After we edited it, the skeleton of the new Historical Photograph database contained all of the fields of the reworked Architecture database as well as other descriptive criteria characteristic of antique photographs. These criteria include such information as the techniques used in the creation of the print and negative, the specific size of the negative and the current physical state of the print.

The final addition to the Historical Photographs collection was a field named 'Barcode' which gives each record a unique nine digit identifier relating it to its digital image as produced by the Higher Education Digitising Service (HEDS). The HEDS were the digitising service contracted by the Conway Library to digitise their collection. As the HEDS digitises a specific photograph they would assign it a unique barcode number this number was used to name the files of each digital image and printed on a label and affixed to each original photograph. Eventually all of the Conway holdings will be given a barcode to uniquely identify each photograph. This barcode field is used by the website to display the respective image or images when a list of records or a particular record is displayed.

4.2   Digitised Images

The digitised images as we received them from the Higher Education Digitising Service were delivered in, 'raw' format. The images were fully sized and digitally uncompressed, suitable for manipulation and viewing only on powerful computers. We first compressed the images to reduce the file size and enable their viewing on a wider range of computers. This compression reduced the file size by an average of nine-fold without noticeable loss of quality. However, even these images could not be used on the website because of copyright and manageability issues; they were the same resolution as the original "raw" images and were too large for practical transmission over the Internet. For Internet availability and for the preservation of the Conway's copyright, we decided on three reduced image sizes for use with database.

The average file size of a raw image from HEDS is 80 Megabytes. An acceptable size for a large image on the Internet is about 0.08 Megabytes, 1,000 times smaller than the raw image. A smaller image file size is necessity because fast Internet connections are still a luxury for most people. However, if connection speeds were not an issue, the average personal computer would still have trouble attempting to open a 4-Megabyte image, and would certainly fail if the large version of the picture were used. That is why we decided to use the Joint Photographic Experts Group (JPEG) compression scheme. JPEG is designed to exploit known limitations of the human eye, notably the fact that small colour changes are perceived less accurately than small changes in brightness. Thus, by using JPEG image compression we can turn one of the 80-Megabyte images of

the Roman Forum into a 2-Megabyte file; invariably the same to human eyes, but now usable by the average computer.

However useful though, 2 Megabytes is still a large amount when the common Internet user can only receive data at the slow rate of 0.007 Megabytes per second. Because of this we chose three file sizes that we felt would be the most useful on the Conway Library's website. A small version of each image is used when search results are displayed as a list of matching records and many pictures have to be displayed with their corresponding records. This small size, or 'thumbnail', requires a small portion of the screen and is on average 0.004 Megabytes, a suitable size for quick transmission. A medium sized image shows more characteristics of the photograph and uses just less than a quarter of the screen when a single record is displayed. Finally, we created a large image size if the user wishes to see the image more clearly. This last version uses most of the screen and shows the most image detail. It is detailed enough so that scholars or students could use it for presentations or reports but it would not be good enough for use in high quality printing so that copyright is never compromised.

4.3   Searches

The primary function of the Conway Library is to provide its users access to the information held within it. Graduate students and scholars use the Conway every day to aid their research. The Conway has no automated searching method, so any search a current user needs to conduct will depend on either his or her knowledge of the desired

photograph, the assistance of a staff member, or a little bit of luck. It is an objective of this project to make searching the Conway's collection as easy to perform as possible.

4.3.1 Searching the library

Previously, the only way to use the Conway collection was to search through its shelves and boxes by hand, navigating with the aide of the label on the side of the box. The Conway had a form of cataloguing system developed for the different sections of the library (e.g. Architecture, manuscripts, etc.), but it was undeveloped and crude. Because of the weak structure of the catalogues they were rarely used. With the Conway collection exceeding one million photographs and growing by approximately fourteen thousand photographs a year, this method usually consumes quite a bit of time. Currently, there are two ways to manually search the Conway's collection: with assistance from the Conway's staff or without assistance.

The fastest way to search the Conway's entire collection is to conduct a search with a librarian or a staff member's assistance. Even with this method, the person searching needs a good deal of information on the photograph wanted, a few hours and a staff member that is not busy. While most of the time this is not a problem, there are instances when such help is not available. Without it, and even more so without prior experience in the Conway, it is very difficult to find exactly what one is looking for, as the library is only organised by location and to search by any other criteria would be impossible.

The second method of searching is an unassisted searching method. Students and scholars that are familiar with the library use this method of searching. As with the assisted method, some knowledge about the desired photograph is needed. This method usually takes a good deal longer to perform because only the more famous objects and artists are labelled on the boxes.

These two systems seem good enough when a specific object is desired and the system works. The problems the Conway's system has are when a more general topic is researched. An example is 19th century European Architecture. This example was actually a problem that was encountered by one of our interview subjects, Ms. Laurence Colchester. She simply took all of the 19th Century material and searched it alphabetically. This task consumed a great deal of time and eventually produced the desired results. However these methods of obtaining information are not very efficient. It was a goal of this IQP to create a prototype searching method and by doing this, the Conway has a way to search its collection without the time consuming method of the manual search.

4.3.2 Designing a computerised search architecture

The project team had as an objective the creation of a computerised search architecture that would provide the library with a fast and easy way to search their digitised catalogue. While the catalogue is not complete, the staff is continuously adding records to it so that there will eventually be a complete catalogue for the Conway. With a

complete catalogue, a computerised searching method will not only save time but also allow users to find their desired results more accurately.

By interviewing the staff, current users and potential users of the Conway, we obtained an idea of how to create a searching method that could best suit its users. This audience represented the primary user base we were designing our system for, so all of their input into our project was regarded with the utmost importance. The information received from this audience included several comments and suggestions as to how our system should work. There were a few suggestions that were common to a majority of the interview subjects, such as that the searching method should be as easy to use as possible, and that it be accurate and above everything else, fast. Many of our of subjects stressed that the searching method needs to be fast so that it will be an improvement over the manual search of the library.

Using the comments and suggestions from the interviews we obtained a general layout of our search architecture. While this general layout was obtained, there was another problem that needed to be solved. Since this search is broadcasted over the Internet, potential users of the system now included a wider range of age groups and learning levels. Our search architecture then needed to accommodate these new users. The solution to this problem was to implement two types of searches, a general keyword search and a detailed topic search.

The general keyword search was aimed toward the user level that consisted mainly of younger students as well as scholars who are not as computer literate and who needed to use the Conway's collection. This search operates like any search that is performed on the Internet by a search engine. There is simply a single field to fill in with

whatever the user wants. A screenshot of the keyword search page can be seen below in
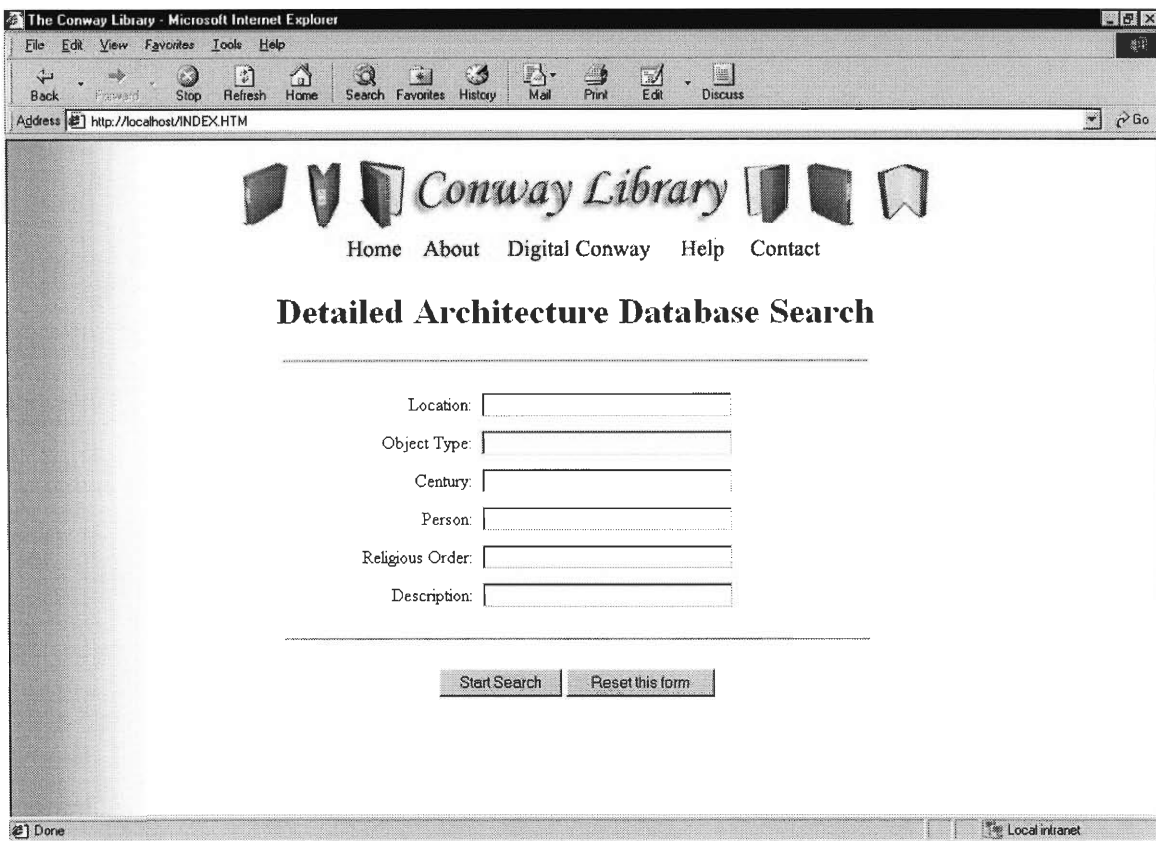
Figure 3.
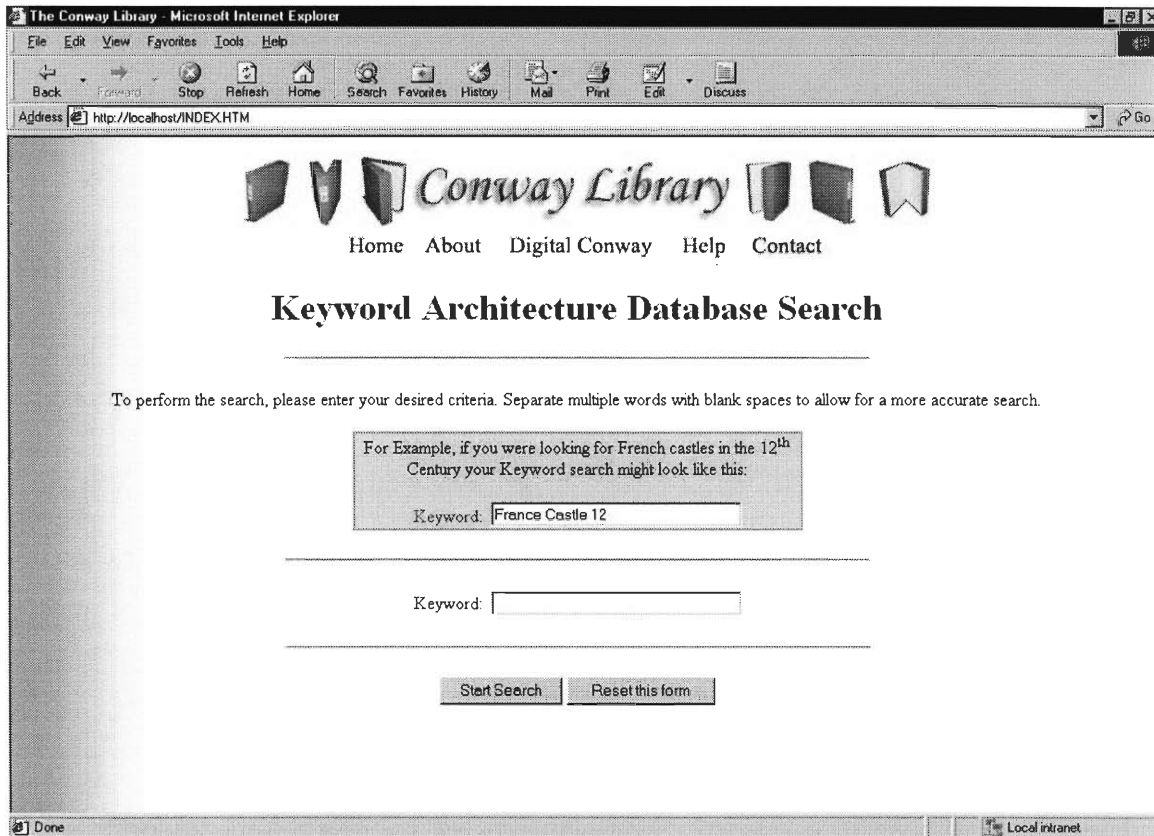
Figure 3: Keyword or Simple Search Screenshot

The search is then performed and gives results based on the information that the users

provided. While this search was primarily aimed at younger users, the search was made

powerful and accurate enough so that higher-level scholars can use this search and

obtained the desired results.

The detailed topic search was aimed at the high-level scholars who would have an

extensive knowledge about the result that they are looking for. While providing searches

that are performed on the individual fields would seem to be the correct course of action,

this actually created more problems than it solved. Implementing the individual field

search seemed to be confusing for users who were not a part of the Conway staff. In order

to resolve the confusion issue we provided topics that were of interest to the users. The

search includes topics that are basic to perform a search such as person, place and type of

object. It also includes some specific details that were requested after user testing was

performed such as the date of photograph. A screenshot of the detailed search can be seen

below in Figure 2.

Figure 4: Detailed Search Screenshot

The search also has one more important feature. It was made so that it could be used as

easily as possible by anyone.

4.4   Website

The website aspect of this project was meant to serve an important function: to provide the interface that will connect the Conway's digital collection to the Internet. While the most important part of the site was the ability to search the collection, the actual appearance of the site holds importance as well. From the interview that we had with Professor Fontanella, we learned that it was important to maintain the Conway's identity on the website while integrating the site into the Courtauld's web as well. While being part of the Courtauld Institute of Art, the Conway and its unique collection stand out from the rest of the Courtauld. To achieve this goal of providing an identity for the Conway on the web, we created the website with the assistance of Eva Bensasson, the web manger for the Courtauld Institute of Art. She helped us throughout the project, watching our progress and giving feedback on the site itself and its context within the Courtauld. Eva's help involved suggestions on colour scheme, page layout, and visual aids. By cooperating with her in this way, we were able to provide the Conway Library with a unique identity while staying within the style and information standards of the Courtauld website.

Miles Samson also aided in the design aspect of the website. He urged us to keep in mind the original intentions of the site. The web site's purpose was to allow access to their educational resource to a much larger audience. Miles Samson felt that in many cases Internet sites are designed far too extravagantly for their own good. The designers become too involved in the appearance of the site and forget about its educational intent.

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4.5　Intranet site

As well as an Internet site, we developed a prototype Intranet system. This site was developed for those who already had access to the Conway Library. The Intranet system is a searchable database catalogue of the same contents that the Internet site contains. When dealing with the Intranet database (restricted locally to the Courtauld) we spent a great deal of time with Tom Bilson. He had a number of similar database examples. Discussing our project with Tom Bilson and viewing his own work with FileMaker gave us a good idea of what direction to move in concerning the Intranet site. He enlightened us on style and layout plans for Intranet pages. A major finding from Tom Bilson was the realisation of the importance of user buttons inside FileMaker database layouts. By creating different buttons for frequent tasks that the Intranet database would carry out, we could greatly increase the efficiency and user friendliness of the system so that a user does not have to be familiar with FileMaker in order to use the system. An example of a resulting Intranet search page can be found below. In this example we were searching for images of the Tower of London.
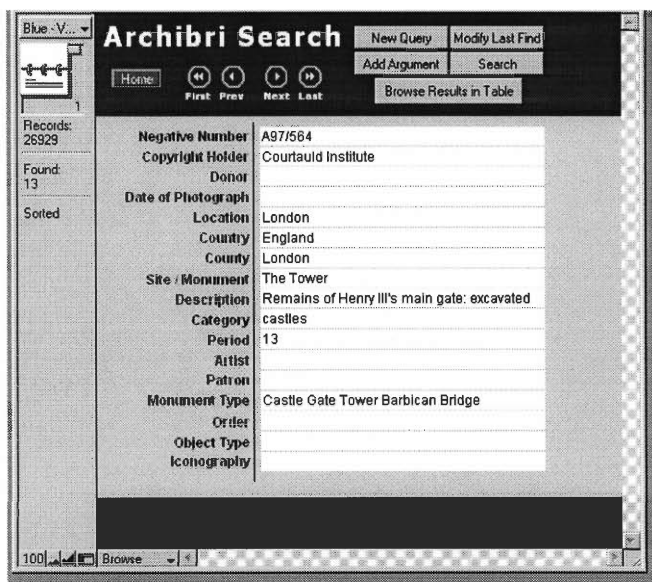
Figure 5: Intranet Filemaker Search Page

4.6   Final Testing

The final result of our web site prototype was achieved after some testing of the system was performed. These tests were done with the help of the Conway staff as well as some of the Conway's potential users. Since the test subjects were people who will use the system we created, their feedback was very helpful and provided us with a few final revisions.

As the tests were conducted, the test subjects would use our website to search the existing Conway databases. They would navigate their way through the site finding the information that they desired. All of the test subjects enjoyed using the system and found it easy to use. The test subjects did offer a few comments concerning the website; most were mainly concerned with the detailed search option of the site. A few tests subjects

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suggested that they would like to search additional fields that were not included in the search criteria at the time. Since these fields were suggested and the addition did not hinder the efficiency of the search, the additional search fields were added.

Comments were not the only thing that we obtained from conducting test runs of our prototype website. By examining the test subjects as they used our website we were able to observe how easy it was for them to operate. While the general operation and navigation of the site was fine, the tests revealed a few places where improvements could be made. Navigational aids were added in the search results as well as the record detail page. Links such as "Start New Search" were added as well. This allowed the user to start a new search at any time from a search results page. As a result of our final tests, we also added a navigational aid on the page that displays the large photograph in the record detail area. Since the large photograph occupies a separate window, we thought it would be useful to incorporate an additional link to close the window at any time the user desires. These were the types of minor refinements that were discovered throughout our test period. Without this testing we may have never noticed these minor problems, thus making our prototype less user-friendly.

4.7   User Manual

Perhaps the second most important accomplishment of this project, other than the development of the prototype interface, was the completion of a user manual. We constructed this manual to insure that the Conway staff would be able to continue work on the web-based interface that we developed for them during our stay in London. We

designed the manual to be simple to follow without losing any of its necessary technical

merit. The manual has been appended to this report and can be found in Appendix D. It

has not been included in the body of the report due to its difference in formatting and

purpose.

5.0   Conclusion

Inside the walls of the classic Somerset House, and contained in the Courtauld Institute of Art lies one of the greatest visual collections of human achievement in the world. Up until the time of our project, however, it was only a privileged few who knew about the collection and were able to explore the holdings of the Conway Library. Some time ago the Conway Library decided that they wanted to dispense with the physical barriers of the Library and to share their hidden treasure with the world. This grand collection of photographs would be available to all through the Internet. However, the lacks of funding and technical personnel were limiting factors for the completion of the project. Through an offsite project program at Worcester Polytechnic Institute we were given the opportunity by the Conway Library to take on the initial planning for their project and to develop a working Internet system.

We decided during the preparation period of this project that we would need to complete a number of objectives in order to provide the Conway library with a working prototype of the interface. Although this interface was not fully completed in terms of the Conway Library's ultimate goal, this system was a huge leap to get them started. We managed to complete all of the tasks that we set for ourselves. These included refining all of the existing databases, designing the web site prototype that would host the Conway Library's collection on the World Wide Web, linking the digital images to their descriptive counterparts, and creating a user manual to be used by the staff at the Conway Library for upgrading and maintenance of the prototype.

These objectives could not have been carried out based on our group's knowledge alone. It was necessary to spend a great deal of time interviewing various potential users of the Conway Library. With the information gathered from teachers, students, Conway staff, and art historians we were able to design and develop a prototype web site that will meet the needs of the Conway Library and its users.

As well as aiding in the development of our original goals, the interviews helped us formulate other possible additions that would improve the usability of the web site. Due to time constraints many of these new ideas were not implemented into the final prototype. However, we did not want these possible improvements to be forgotten. We made sure to include them in our final report in the form of detailed recommendations. This recommendation sheet would allow the Conway Library or any future project group to research the ideas further and possibly some day include them into the still developing web site.

In closing, although we did not create a final solution for the Conway Library's problem, we did help them take a huge step in the right direction. The prototype we have created offers an example of how useful the completion of Conway's undertaking will be to the academic world. By beginning to make their collection available over the World Wide Web, the Conway Library has granted global access to a valuable educational resource.

6.0 Recommendations

This Chapter of our report provides recommendations for further areas of work towards the completion of the Conway Library's user-friendly Internet-based online-collection. These recommendations are based on ideas that the Conway staff, the Courtauld staff, and those ideas we had for the future of the Conway's electronic collection. Since we were the first group to work on this project, our focus was to complete our project goal of providing the Conway Library with a prototype database system that will allow people around the world to access the Conway's digital collection through the Internet. Due to time constraints some ideas about improving the Internet system were not implemented into our prototype. While not being a main priority, these ideas were very valuable and should be considered in future projects with the Conway Library.

Our recommendations for the future of the system are separated into recommendations for further upgrading of the computer hardware, the database, and the web-based interface. As stated above, some of these recommendations are based on ideas that the Conway Library and Courtauld Institute staff had. The majority of these recommendations however, were insight we had into what courses of action the Conway Library might want to pursue in the future to make their system easier to use and more accessible in the future.

6.1   Computer Recommendations

In working on this project, we initially thought the server that the Conway Library provided us with would be more than adequate for our use and would continue to be adequate for any future use. After working with the databases and the digital images, it became apparent that any significant expansion of digitisation efforts within the Conway Library would necessitate a larger amount of computer resources in the form of data storage. The crux of the problem we encountered was with the file size of the high quality digital images. Many of the uncompressed files received from HEDS were close to one hundred megabytes in size. These images were so large that by placing all 550 of the uncompressed, full size images on the server along with their respective medium size images, thumbnail images and the databases, about 85% of the 64 Gigabyte hard drive storage space on the computer will be used. This estimate was based on an average file size for the digital images. There were plans to use a smaller file size. Compressing the images as much as two thirds of the original file size would result in a greater amount more space available for larger quantities of high-resolution images.

With NOF funding, the Conway hopes to digitise one hundred thousand photographs, approximately one tenth of its collection. More storage space than is currently available at the time of our project would be required to store so many high quality images. The best estimate that we can make as to how much storage the Conway will need to store 100,000 high quality images is about eight Terabytes, or 8,000 Gigabytes. This number is roughly a 12,500% increase in the amount of storage needed for this project. We arrived at this estimated number by calculating the storage currently

used for the 550 digitised images, their thumbnails, and the databases, and projecting a figure for the storage of 100,000 images. Our figure is in close agreement with the predicted storage requirements for the digitisation programme proposal prepared by Tom Bilson and the Courtauld Institute in their bid for the NOF digitisation funding.

6.2   Database Recommendations

The database is an essential part of the Conway collection. It is the cataloguing system that used to keep track of all of their holdings. During the course of the project, we spent a great deal of time using the database software to refine the three existing Conway databases, and became familiar with the database software's features and various limitations. During the project we felt that the FileMaker database software was sufficient for the Conway's needs, as it provided easy web publishing of the databases and a simple, yet powerful graphical user interface that could be used for cataloguing purposes and was already familiar to the Conway staff. During our time at the Conway there was no need to re-evaluate the database software. However, as the catalogue expands, problems may occur and the Conway's choice of database software will have to be re-evaluated. This section provides the recommendations our group made concerning the databases in the future.

6.2.1 FileMaker Upgrade

The Conway staff uses FileMaker Pro databases for their cataloguing purposes. FileMaker Pro has several functions that make publishing a database on the World Wide Web very easy. While making this process easier, there was a limitation with the database software used during our project, FileMaker Pro 5. The base version of FileMaker Pro 5, was restricted to 10 concurrent Internet users. Other versions of FileMaker 5 software did not have this restriction such as FileMaker Pro Developer and FileMaker Pro Unlimited. These two database software packages could allow far more Internet users access the database via the web simultaneously. We recommend that if the Conway wishes to enable more than 10 users access to the database simultaneously, to upgrade to one or both of these software packages.

6.2.2 Full-time Staff

Another recommendation that we feel would benefit the long-term project is that the Conway look into hiring a full or part time staff to work on the cataloguing of its collection. At the time of our project there was no effective cataloguing system in place. The existing catalogue itself was separated into three sections with only one staff member working on each portion. In addition to cataloguing, each staff member had duties within the Conway Library so their efforts to expand the digital catalogue were not always their first priority. With this collection constantly growing, we feel that that it would be

extremely helpful to hire additional staff to aid in the expansion of the catalogue of

current holdings as well as new acquisitions.

6.2.3 Database Software Upgrade

Our final recommendation concerning databases deals with the various software

packages that could be used. FileMaker products are not geared towards large volume,

industrial strength database applications. The program itself is very fast when dealing

with small databases, such as those created by the Conway Library, which contains about

thirty thousand records each. While FileMaker handles databases of this size very well

there may come a time when the databases could become too large and the speed of the

software will noticeably decrease as a result. For this reason, our group recommended

that if the Conway electronic collection greatly increased in size, then an evaluation of

the performance of the FileMaker software should be undertaken, and if necessary, other

choices for database software investigated.

6.3   Website Recommendations

The Conway's web-based interface served the important function of supplying the

link between the databases and the rest of the world through the Internet. Since the

website was the main host of the Digital Conway system many ideas were suggested by

potential users during the site's development. At the time of our departure the interface was fully operational, but we felt that these additional recommendations would improve upon the foundation that we created.

6.3.1 Web Site Revision

The first recommendation that we had for an update or revision to the website was rewriting some of the web language. The rewriting process would more specifically deal with the link between the web and the database. Currently the interface uses CDML (Claris Dynamic Mark-up Language). This language was easy to use and was designed specifically for web publishing with FileMaker databases. There were no apparent problems with the use of CDML, but the language was in line for replacement with an improved language solutions created by FileMaker Inc., who announced during the course of our project that it would no longer be supporting CDML in its future releases of FileMaker Pro. FileMaker Inc. also discontinued official technical support for its Claris Home Page product, which we used to create the web pages used in the Conway website. This package greatly simplified the task of integrating CDML in the website.

In future releases of FileMaker Pro, the preferred method to be used for FileMaker web publishing will be the Extensible Markup Language, or XML. Currently FileMaker does quietly support XML so there would be no problems using it with the current database. However, it is possible that only XML will be supported if the database software is upgraded to a newer version in the future. This lack of support would render the website we developed with HTML and CDML unusable.

XML has many advantages inherent in its design that make it desirable compared to HTML and CDML. XML is an open standard and is not restricted to a singular use like FileMaker's proprietary CDML. Also, XML redirects more tasks to the website user's computer, such as sorting records or formatting text for display. All that the web server has left to do is deliver the data to the user. This shift of burden is a great advantage that enables the web server to successfully handle a much greater number of requests than done previously.

Unfortunately, because XML was an emerging standard, support for it only existed for the latest versions of the two most popular web browsers, Microsoft Internet Explorer 5.5 and Netscape Navigator 6. To further complicate the situation, both browsers also varied in their level of support for XML. Unfortunately, not all potential users of the Conway site used or will be using the latest web browsers. Our decision to use HTML in combination with CDML rather than XML was heavily influenced by the lack of browser support. We estimate that by the time a new version of FileMaker is released, XML support across the browsers will be consistent and compatible that enough users will be using XML enabled browsers that an XML based web solution can be constructed.

There are a few disadvantages to using XML. The language itself requires a more intricate knowledge of web programming languages as well as a more extensive knowledge of HTML. While the replacement of CDML with XML will eventually need to take place, we feel that a future group will be able to implement these necessary changes and take advantage of the new technology to add appropriate improvements to make the Digital Conway search as up-to-date as possible.

6.3.2 Authority File

Another recommendation that we have is for the creation of an authority file for the Conway databases. An authority file is a tool that acts as a standard reference for nomenclature in an information system. Because there are different ways that one can express a person's name or multiple persons with the same name it is necessary to have an application that will connect the names that relate to the same individual and separate those that are different.

To further enhance the ways in which people can search the Conway, it is our recommendation that an authority file be used in conjunction with the databases for at least the names of persons to improve the overall efficiency of searching the Conway collection. For example, with an authority file the names Guillaime de Sens and William of Sens can be made to represent the same individual. Creating such an authority file would allow users searching for records containing Guillaime de Sens to also browse records containing William of Sens within the same search.

6.3.3 Multiple Language Page

Before this project was undertaken, scholars from different countries would have to travel to London to view the Conway collection. Now with the most updated catalogue

on the Internet, they can view the Conway's holdings without travelling. This does pose a certain language problem for some users. As the web site and search method stand, they are only in English. With this problem, we recommend an update to the Digital Conway system so that multiple languages can be supported. This revision will include a few additions to the entire system. The web site itself will need to be written in the multiple languages so that non-English speakers may use the page.

Another important addition is to the database. Some type of translation of the data in the database so that the search can take place in different languages. This might prove to be extremely difficult as the database is very large and growing every day.

6.3.4 Similar Image Search

During an interview, Katherine Hawks shared a great idea for an addition to the database search over the Internet. She thought it would be a useful tool to have a function that would allow someone to search for similar images after they had already found an Image they wanted. Although we felt this was a remarkable idea, it was too difficult to incorporate at the time. We would have to conduct much more research in order to decide on the best procedure for doing this. We would need to set a standard definition for what similar meant in this case. Would it mean similar in object types or location? In other words, if a search resulted in an Italian castle would we want to have similar pictures of castles or would we want similar pictures of Italian architecture? As one can imagine there could be endless solutions to this problem.

6.3.5 Interactive Tutorial

Making our web interface as user-friendly as possible was always a consideration we had while completing our project. To help us further refine our interface, we conducted several tests and demonstrations of our prototype to the Conway staff and potential users. From these tests we received helpful comments about how the site operated and appeared. An example is that we received some input about what fields a person might want to search in the detailed search area. Since these tests and demonstrations were conducted with our team present, we saw the need for some sort of instruction. After some discussion with our liaison and advisors, we concluded that an interactive tutorial on using the web site would be helpful to new users. We recommend that this tutorial be interactive so that it will be more informative than a regular text guide.

6.3.6 Children's Site

Once we arrived in London and continued conducting of our interviews, we discovered that some of the staff at the Courtauld Institute wanted to see the Conway's collection available to children as well as scholars. While making a site for children to use was never a priority of ours, we always tried to make our searches as easy to use as possible for the more general audience of the Internet. We believe that a simple keyword search might be useful for people who are familiar with the web but not with the Conway collection. The simple search did work in most cases but after talking with Irene Davies,

we learned that a front-end made specifically for children would be more appropriate for younger viewers. We were not prepared to construct such a site, as this would require research into making sites specifically for children. Even the workload alone to make a separate site for children was more than we could handle while finishing our project. However, it is very important to make the system easier to use for all types of users. We believe that this task is perfect for a future IQP group who would research that specific area.

6.4   Future WPI Sponsored Project Groups

As was mentioned throughout this chapter, there was still a great deal of work to be carried out to complete the Conway's online interface. Many of the suggested improvements would be ideal for WPI sponsored project groups, be it an Interactive Qualifying Project (IQP) or a Major Qualifying Project (MQP). In fact, we believed there were already possibilities for each type of project.

As mentioned above there was still a large amount of research needed to complete the children's site. We felt that the work that this portion of the Conway web site demands was perfect for an IQP group to complete. The main part of the project would involve researching what methods would be best when designing a web site specifically for the use of children, but it also involves the technical side of actually developing and implementing a working web page.

Other areas of the project would be much better suited for MQPs. For example, in this chapter we mention the possible need to change database software in the future.

This task would involve researching various database programs currently on the market and deciding which would be best for the Conway Library staff to use. Also, once the new database software was installed someone would need to import the existing databases from the old software. Both of the above mentioned tasks lack the social aspect that an IQP demands, but they seem perfect for a computer science MQP.

There are a wide variety of possibilities for future WPI projects. We have only mentioned a few. The growing relationship between the Conway Library and WPI seems to offer endless possibilities for how much the Conway's Interface will evolve over time. Hopefully the Conway will continue to use WPI as a resource in the future because we feel the school, its offsite project programmes, and students have a lot to offer.

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8.0 Appendices

Appendix A

The Courtauld Institute of Art and The Conway Library

The Courtauld Institute of Art is the major center of the history of Western Art, and one of the premier art historical institutes in the world (Bilson, 2000). It is constituted as an integral part of the University of London. Within the Courtauld Institute reside two photograph collections, the Conway Library and the Witt Library.

The two libraries were started as separate private collections by Lord Conway and Sir Robert Witt (Bilson, 2000). The Conway Library came to the Institute in 1932, while the Witt Library was transferred to the Institute after the death of Sir Robert in 1952. The Conway and Witt are teaching and research collections that are open to the public as well as to students and staff. The material is directly accessible to the user. Both libraries have been continually increased and expanded upon since becoming part of the Institute. This includes coverage of their respective areas up to the present day.

The Conway Library currently contains just under a million images (Bilson, 2000). These are photographs of architecture, architectural drawings and publications, sculpture, manuscripts, metalwork, ivories, seals, stained glass, wall paintings, panel-paintings, and textiles. Included within the library is the Edward B. Garrison Collection, a specialist photo-collection devoted to early medieval Italian painting. The scholarly

back-up to this collection, provided by the donor, has been largely updated thanks to a grant from the Kress Foundation. Unfortunately, the Garrison Collection can only be visited by appointment. A CD-ROM of this collection is presently being produced.

During its seventy-five years of existence at the Courtauld Institute, the main body of the Conway Library has been built up by various means (Bilson, 2000). Its stock of original photographs has been increased by donations and purchases of negatives, such as those of F.H.Crossley, A.Gardner, F.R.P.Sumner, B.Bailey and B.Delves. The library also has many of the pictures taken by the distinguished contemporary architectural photographer, A.F.Kersting. The exceptional interest of some smaller collections of original photographs derives from the personality of the photographer or from the historic moment recorded.

With the assistance of in-house photographers, the Conway Library has initiated much of its own photography all over the world (Bilson, 2000). A large number of the photographs are the work of graduate students whose informed insights make the library an especially valuable instrument of research.

Finding-aids available in the Conway Library include card indexes of architects represented in the 19th and 20th century architecture, sections (with building lists), architects represented in the architectural drawings and publications sections, artists represented in the sculpture section, British church monuments and British fonts by location, and manuscripts by location (Bilson, 2000).

Organization of the Main Sections of the Conway Library

ARCHITECTURE: Pre-1800 (1830 for Britain), 19th century, 20th century, and within these sections by location.

ARCHITECTURAL DRAWINGS: By century, school and artist.

ARCHITECTURAL PUBLICATIONS: By century and country of publication.

SCULPTURE: By century, school, artist, or for anonymous work by type.

MANUSCRIPTS: By century, school and book type.

Employees of the Conway Library

The Conway Library is under the overall control of Dr. Sue Price, who is the Librarian and Head of Academic Information Services at the Courtauld Institute (Dr. L. Grant, 2000). Her academic background is initially in science, then librarianship and information sciences, then art history. Her particular area of expertise is 19th century decorative arts and crafts.

Within the Conway itself, the Conway Librarian is Dr Philip Ward-Jackson (Dr. L. Grant, 2000). He is on study leave until March 2001, writing a book on sculpture in

the City of London. His major area of expertise is French 18th and 19th century sculpture and art criticism, but his interests are very wide-ranging.

Dr. Lindy Grant is the acting Conway Librarian while Dr. Philip Ward-Jackson is away (Dr. L. Grant, 2000). Dr. Grant's background is in medieval history and medieval architectural history, and her area of expertise is north French ecclesiastical and architectural history c.1050-1250. A couple of years ago she published a book entitled Abbot Suger of St Denis: Church and State in Early 12th Century France, with Longmans; at the moment she is in the middle of rewriting her doctorate, which was on Gothic architecture in Normandy c.1150-1250, as a book for Yale University Press.

Geoffrey Fisher deals with photographic orders, but also curates architectural drawings, and post-medieval British architecture (Dr. L. Grant, 2000). His own work focuses on 17th century British sculpture.

Mike Phipps is presently standing in for Dr. Ward Jackson, curating the sculpture collection (Dr. L. Grant, 2000). He is a late medievalist, who started doing some research at the Courtauld, but let it drop a little, and is now thinking about getting back into it, probably working on late medieval castle design.

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Appendix B

Interview Summary – Outline

Name:

Title:

Date:

How comfortable are you using the Internet?

Would you like to have the Conway accessible over the World Wide Web?

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

Is there anything you would like to see incorporated into the Conway's web page?

Interview Summary – Tom Bilson

Name: Tom Bilson

Title: Director of Digital Media, Courtauld Institute of Art

Date: 15-01-01

How comfortable are you using the Internet?

Being the director of digital media, Mr. Bilson is very comfortable using the Internet and computers in general

Would you like to have the Conway accessible over the World Wide Web?

Yes, Mr. Bilson is one of the main persons at the Courtauld Institute of Art trying to get funding for the digitisation project.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

N/A

Is there anything you would like to see incorporated into the Conway's web page?

N/A

Mr. Bilson is the director of digital media at the Courtauld Institute of Art. With the Conway Library being a part of the Courtauld, Mr. Bilson was involved partially with the creation of this project. While having a rather insignificant role with our project directly, he is of some importance as far as publishing our web site on the Internet.

Mr. Bilson informed us about a program in which the Conway was going to be involved in. The program is named Art Source. It involves the publication of different types of art galleries in London over the Internet so that the public can view these collections with greater ease. Mr. Bilson explained how essential the completion of this project is to the goal of ArtSource.

Mr. Bilson also provided us with the fact that opening up the Conway's collection over the Internet will allow it to be accessed by a broader range of people than currently use it. He then suggested that making a simpler way to search the collection was important, as more than just higher-level scholars will be able to use the Conway over the Internet. He also suggested that a consultation with Eva Bensasson, the web manager of the Courtauld Institute, might be useful in the design and implementation of the Conway's web site.

Interview Summary – Laurence Colchester

Name: Laurence Colchester

Title: Post Graduate Student

Date: 23-01-01

How comfortable are you using the Internet?

Ms. Colchester was very comfortable using the Internet and used it on several occasions to perform some type of search.

Would you like to have the Conway accessible over the World Wide Web?

Ms. Colchester expressed that she would like to have the Conway accessible over the Internet if the system was fast.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

N/A

Is there anything you would like to see incorporated into the Conway's web page?

Ms. Colchester supplied an interest in having a 3-D virtual tour of the specific buildings she would search for. Although it was highly improbable that this would happen, she believed that it would be a good way to research a building.

Ms. Colchester is a Post Graduate student at the Conway library. She is a new student to the Conway and has only used its collection a limited number of times, mainly researching renaissance churches, palaces and Saint Denis. Ms. Colchester has never used

an electronic catalogue but is reasonably computer literate and has had previous experience with using the Internet.

When searching the Conway's collection, Ms. Colchester has found that the Conway's collection is simple and straightforward. Her method of searching the collection was simply to search all the different countries in alphabetical order until finding the item she is looking for. She felt that the idea of having the Conway collection on the Internet would be a very good tool if the system were easy to search and fast. She also expressed that fast downloading pictures were very important.

Ms. Colchester also provided us with some very valuable suggestions. First, she expressed the need to be able to compare different images on the same page. She thought that an ideal number of pictures per page would be between 3 and 6.

Secondly, she thought that while this would be very helpful, providing more detailed pictures was also very important. Since most of her work involves looking closely at various types of architecture, having pictures of high quality were very important.

Lastly, Ms. Colchester thought that features like more extensive descriptions; comparative searches as well as similar era links would be real interesting and quite helpful to her.

Interview Summary – Irene Davies

Name: Irene Davies

Title: Head of Education at the Tower of London

Date: 29-01-01

How comfortable are you using the Internet?

N/A

Would you like to have the Conway accessible over the World Wide Web?

She felt, like most others, the Conway's collection should be placed on the Internet. She felt its use as an educational resource was a very valuable tool and people could benefit from it being accessible over the web.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

N/A

Is there anything you would like to see incorporated into the Conway's web page?

Ms. Davies wanted the information to be displayed is as simple a manner as possible, especially when considering the site may be used by children.

Ms. Davies is the head of education at the Tower of London and her primary duty is to educate groups of school children that visit the tower. The school children that she

was in charge of educating were of ages between five and fourteen. To handle this broad range of learning levels, Ms. Davies has varied techniques and presentations, which kept the children interested and active about the history of the tower.

While Ms. Davies provided our group with demonstrations and techniques on how she taught the children, she was also providing us with useful insight into creating a page that could be used by a younger audience. These demonstrations illustrated, that by making the learning process simpler and interesting, a more diverse user base could be obtained.

Interview Summary – Peter Ferguson

Name: Peter Ferguson

Title: Professor of architecture at Wellesley College

Date: 22-12-00

How comfortable are you using the Internet?

Professor Ferguson is somewhat familiar with the Internet, however he does not have extensive experience navigating the World Wide Web. Commonly he uses computers to send and receive email.

Would you like to have the Conway accessible over the World Wide Web?

Yes, living in the United States he would find it a great advantage to browse through the Conway Library's collection on the Internet at his convenience.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

As a professor of architecture his method of finding images in his field is very systematic. His preferred method of navigation would be alphabetically by site name or if possible by site type. Looking for architectural features such as fireplaces or capitals could then be used as well to refine his search. Thus a multiple criteria search could be very helpful in compressing the time required to find a specific item.

Is there anything you would like to see incorporated into the Conway's web page?

Dr. Ferguson mentioned that he would gladly pay for the services that an online Conway Library would provide.

In the interview Dr. Ferguson conveyed that he is a novice user of the Internet. Because of this the questions we used were limited to his understanding of the subject and his field of study. However, his input was valuable as a long time user of the Conway and a potential benefactor from the creation of a Conway Library accessible over the Internet

Interview Summary – Lee Fontanella

Name: Lee Fontanella

Title: Head of humanities department at Worcester Polytechnic Institute

Date: 20-12-00

How comfortable are you using the Internet?

Professor Fontanella is familiar with using the Internet.

Would you like to have the Conway accessible over the World Wide Web?

Yes, he is very impressed with some of the Conway's holdings and feels it would be a great benefit to the academic world to have this collection available over the Internet.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

A descriptive search option would be the easiest method. By searching under key words, one would easily be able to find what he or she was searching for.

Is there anything you would like to see incorporated into the Conway's web page?

Professor Fontanella felt that the Conway should have its own identity when placed on the World Wide Web. He felt that it should be compatible with the image of the Courtauld Institute of Art, but at the same time show a sense of individuality.

The original purpose for meeting with Professor Fontanella was for him to discuss what he new about the Courtauld Institute of Art and the Conway Library. He had recently visited the institute and had some insight regarding our project.

Professor Fontanella was already familiar with this type of project. He advised an IQP group the previous year at the Victoria and Albert, also located in London. His main concern with our project was with how we planned to pace ourselves. He informed us that his only regret from the Victoria and Albert project was that the group may have tried to tackle too large of a task. By limiting the amount of work we planned on completing we could produce a higher quality end product. This advice makes a lot of sense for our group. The enormous size of the Conway Library's collection introduces many problems. There would be no way possible for our group to complete an online collection for all of the Conway's holdings. We knew we would have much better luck working with only a small portion of the collection.

Professor Fontanella also shared with us his opinions in terms of the design aspect of our web site. He felt it would be a good idea to keep the Conway's uniqueness in mind when making the page. He informed us that the impression he received from the Conway during his last trip to London was that they wanted something that would help keep their identity.

This interview helped us re-test our interview procedures versatility. Also, advice from a former IQP advisor about how we should set our goals was more than helpful. It allowed us to make a general task chart that covered the entire time we would be working on the Conway project.

Interview Summary – Catherine Gordon

Name: Catherine Gordon

Title: Deputy Witt librarian

Date: 24-01-01

During one of our weekly meetings with our advisors, Dr. Grant mentioned the possibility of using authority files in our database. Our group was not knowledgeable on this subject matter. Dr. Grant arranged for us to talk to Catherine Gordon who was involved with the Witt Library's database, which used authority files.

As Ms Gordon explained to us, authority files link together similar words that would other wise be treated as separate entities. For example, some artists' names are spelled differently depending on what language is being used. When searching for a certain artist you might not find all the possible entries because of this. An authority file could prevent that from happening. An authority file would link the names together, so no matter what the spelling of the name, you would get every possible result from the database.

Something like an authority file would indeed be useful for the Conway's database seeing as how the Library contains works from all over the world. Authority files definitely seemed to be a valuable resource when building databases similar to the one we were in the process of constructing. Catherine Gordon not only helped to familiarize us as to what an authority file was, but also as to what it did.

Interview Summary – Catherine Hawks

Name: Catherine Hawks

Title: Post Graduate Student

Date: 08-02-01

How comfortable are you using the Internet?

Ms. Hawks was very comfortable using the Internet and has used it to perform searches for her research. She also expressed a dislike for obtaining materials that were not relevant for the search to appear in the resulting list.

Would you like to have the Conway accessible over the World Wide Web?

Ms. Hawks expressed that she would like to have the Conway accessible over the Internet if the system was fast and easy to use.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

The easiest way to search would be to use the Location, Object type and Patron of the photo.

Is there anything you would like to see incorporated into the Conway's web page?

Ms. Hawks suggested that there might be a selection of topics in the simple search area for younger school children.

Ms. Hawks is a Post Graduate Student at Cambridge University. Her area of study is Late Medieval Heraldry. This was Ms. Hawk's first time visiting the Conway Library. Before the interview, she was given a brief tour of the library and an introduction into how to find photographs in the library. Her impression of the library was that it was a simple yet effective way to search through the collection if the person searching had adequate knowledge.

In her area of interest, Ms. Hawks has primarily used libraries to find her research. When using a library catalogue, it was necessary for her to know the author, place and area to find her desired resources. Most of the time this is useful but she expressed a desire to be able to find similar buildings in different locations that contained objects by the same artist. On top of this she expressed the desire to be able to search by the date of photograph and patron of the object.

Interview Summary – Michael Phipps

Name: Michael Phipps

Title: Acting Conway librarian

Date: 15-01-01

How comfortable are you using the Internet?

Mr. Phipps is very comfortable with using the Internet. In fact, during our interview he navigated amongst many Internet sites in order to provide us with visual aids.

Would you like to have the Conway accessible over the World Wide Web?

Part of Mr. Phipps' job at the Conway involves him searching the collection himself. Making the Conway Library's holdings available over the Internet meant that we had to first create a standard way to catalogue the collection. This was of great interest to Mr. Phipps.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

Mr. Phipps explained to us the difficulty of cataloguing the databases in one standard way. In order to make the simplest search, he felt one would probably want to search by a keyword. This could mean using title, date, artist, or even a descriptive word depending on what the person searching was looking for.

Is there anything you would like to see incorporated into the Conway's web page?

Mr. Phipps would like the web page to be able to show multiple images at the same time. This would allow a historian to compare and contrast images without downloading or printing every specific image.

Michael Phipps was the first person that we conducted an interview with after arriving in London. It was the first chance we had to gain insight from an actual employee of the Conway. Everyone interviewed until this point was someone totally unrelated to the Conway Library. This allowed for a new interpretation of how the project should be addressed.

Much of the time spent with Michael was used to discuss cataloguing images at the Conway. He informed us that it was very difficult to catalogue the Library's collection in one standardized method. The Conway Library has pictures of architecture, sculpture, and manuscripts. No one method of cataloguing could be used for the entire collection, so separate methods were made for each sub-collection. This not only helped us refine the database, but it also helped us in developing how to set up a search page for the Internet interface.

Our group spent about three hours with Michael discussing the different methods of cataloguing. This interview gave us a good deal of insight as to how the Conway is set up. Coming into the Conway Library with no clue of how it works makes it almost impossible to design the best possible web page.

Interview Summary – Miles Samson

Name: Miles Samson

Title: Professor of art history at Worcester Polytechnic Institute

Date: 30-11-00

How comfortable are you using the Internet?

Professor Samson is relatively comfortable with Internet use.

Would you like to have the Conway accessible over the World Wide Web?

Professor Samson felt that it was a good idea to have the Conway's collection placed on the web. It would allow a valuable educational resource to be used on a much larger scale.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

Professor Samson stated that allowing a large, detailed set of search criteria would be the best way to set-up this database. Allowing someone to carry out specialized searches would greatly decrease the amount of time and effort for a researcher or art historian to gather up the appropriate images for whatever study they may be conducting.

Is there anything you would like to see incorporated into the Conway's web page?

He felt that the page should be simple to navigate the page. He said that the layout should be designed with only the main intentions of the site.

In order to develop the most user-friendly computer interface for the Conway Library's collection we decided to carry out a number of interviews. Interviews allow us to acquire some general insight from any potential users. This would allow us to design the interface based on their needs, not what we think they need. Professor Samson was the first person interviewed in this process. The main intention for conducting his interview was to gather some experience regarding the interviewing procedure we planned on using throughout the course of the project.

The interview consisted of a few predetermined questions, but ultimately was left open to general conversation. We felt this would be the best way to gather insight from the person being interviewed. The questions dealt with a person's familiarity with computers and the internet, likes and dislikes with already existing online collections, and any suggestions of what they would like to see from the Conway Library's web site.

We gathered two important points from this particular interview. The first point was that the interviewing procedure we designed was more than acceptable for our purposes. Leaving discussion open to flow in any direction allowed us to obtain information we might otherwise miss. The second point was directed towards the web site we would be creating. Although Professor Samson had never used the Conway Library he did acknowledge it as being a useful resource to the academic world.

Professor Samson based his suggestions on CD collections of artwork he has used in the past. Some CDs were set up as searchable databases where others were displayed in the form of virtual galleries. Professor Samson felt in order to have a successful gallery online it was important to make sure it serves its purpose. In other words, to keep the web site educational rather than entertaining. He informed us that in

many cases the collections are displayed using far too many graphics and visual enhancers. These pages focus more on the appearance of the web site than the actual purpose. To make a successful front end to the Conway Library's collection we would need to always keep in mind we were designing it for educational purposes.

Although this was our first interview it was a very successful one. We determined that our interviewing procedure was more than sufficient for our project. It would allow us to interview people from any part of the academic world without having to change the format every person. The interviews flexible structure would allow us to gain information that could not be obtained solely from the questions. In addition, we gained our first piece of insight into the design aspect of the interface. We decided to use the same form of interview throughout the duration our project.

Interview Summary – Dr. Peter Stewart

Name: Dr. Peter Stewart

Title: Lecturer in Classical Arts, Courtauld Institute

Date: 07-02-01

How comfortable are you using the Internet?

Dr. Stewart is comfortable when using the Internet; He increasingly uses it for academic research, as a growing amount of research materials are accessible on the World Wide Web, and also uses it to find general information that he is seeking, such as addresses and telephone numbers.

Would you like to have the Conway accessible over the World Wide Web?

Dr. Stewart agreed that a web-accessible version of the Conway's collection would greatly serve to complement and enhance the services the Conway provides to its users. Although the nature of some of the photographs that the Conway holds are not of particular interest to his studies, such as newspaper clippings, many images are useful and it would be beneficial if they were placed online.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

In answering this question, Dr. Stewart discussed a previous position he held at The Beazley Archive where a collection including photographs had been placed online. He said that the interface intended for academicians was very robust and included many

options. In summary, he suggested that for academia, the best way to search is to enable the searcher to search using as many available criteria as possible. Often, researchers are searching for very specific things, and they should be afforded the ability to quickly perform a very specific search.

Is there anything you would like to see incorporated into the Conway's web page?

N/A

Interview Summary – Barbara Thompson

Name: Barbara Thompson

Title: Curator of the manuscripts collection at the Conway

Date: 17-01-01

How comfortable are you using the Internet?

Barbara Thompson is comfortable with using the Internet.

Would you like to have the Conway accessible over the World Wide Web?

Much like the rest of the staff at the Conway, Mrs. Thompson is very excited about the development of the development of an Internet based collection of the library's holdings.

In your opinion, what would be the simplest and most efficient way to search for specific images over the Internet, (e.g. Title, Date, Artist)?

N/A

Is there anything you would like to see incorporated into the Conway's web page?

One of Barbara Thompson's main concerns is that the pages containing and text information about a specific image be "printer friendly." She would like the page to be as plain as possible so that it would not requite a long printing time.

As was already mentioned throughout our project, we needed to refine all of the Conway's databases. This could not be done effectively by working with our liaison alone. Although Dr. Grant was the original creator of the separate databases, others have modified them over time. Barbara Thompson was the in-house expert on the manuscripts database. By conducting an interview with her we were able to gather information that would allow us to standardize the manuscripts database in the best way possible.

The interview was conducted around Barbara Thompson's computer so that we could reference the database as we suggested various refinements. Our group was trying to simplify the database as much as possible. This would help to improve the efficiency of searchable database we were trying to build. Barbara Thompson was with us to offer suggestions as to how we could do this with out loosing anything of importance.

Barbara wanted a more organized format for the database. This would allow her to easily use it to print labels. Our group on the other hand was more concerned with making the database more standardized. By discussing Barbara Thompson's wants and our suggestions for the database with her we were able to get some valuable insight as to how we would eventually refine the manuscripts database.

Appendix C

Web Page Layout

Figure 6: The Conway Library Home Page

Conway Library

Home | About | Digital Conway | Help | Contact

About the Conway Library

At present the library contains just under a million images. These are photographs and cuttings of architecture, architectural drawings and publications, sculpture (approximately 10,000 sculptors are represented), manuscripts, metalwork, ivories, seals, stained glass, wall-paintings, panel-paintings, and textiles. Included within the library is the Edward B. Garrison Collection; a specialist photo-collection devoted to early medieval Italian painting. The scholarly back up to this collection, provided by the donor, has been largely updated thanks to a grant from the Kress Foundation. A CD-ROM of this collection is about to be produced. The Garrison Collection can only be visited by appointment.

During the seventy-five years of its existence at the Courtauld the main body of the Conway Library has been built up by various means. Its stock of original photographs has been increased by donations and purchases of negatives, such as those of F.H.Crossley, A.Gardner, F.R.P.Sumner, B.Bailey and B.Delves (the Rupert Gunnis Bequest), and the library has many of the pictures taken by the distinguished contemporary architectural photographer, A.F.Kersting. The exceptional interest of some smaller collections of original photographs derives from the personality of the photographer (Robert Byron, T.E.Lawrence) or from the historic moment recorded (Walter Benington's contemporary record of the works of H.Gaudier Brzeska, or the Macmillan Commission photographs of war-damaged monuments).

The library has initiated much of its own photography in Britain and abroad, with the assistance of in-house photographers. A large number of the photographs are the work of graduate students whose informed insights make the library an especially valuable instrument of research.

Organisation of the main sections of the Conway Library:

- ARCHITECTURE: Pre-1800 (1830 for Britain), 19th century, 20th century, and within these sections by location.

http://localhost/about.htm

Figure 7: The Conway Library About Page

Conway Library

Home | About | Digital Conway | Help | Contact

Search the Conway Collection

The Conway's elaborate collection has been separated into the following categories. To search these categories, please select the type of search you wish to perform. The Keword search is a general search that will produce quick results. For a more specific search, the Detailed search is the best option.

Search the Architecture Collection

- Keyword Search
- Detailed Search

Search the Historic Photograph Collection

- Keyword Search
- Detailed Search

Search the Manuscript Collection

- Keyword Search
- Detailed Search

http://localhost/CONTACT.HTM

Figure 8: The Portal to the Conway Library Database Searches

Figure 9: The Keyword Search Page

Figure 10: The Detailed Search Page

Figure 11: The Search Results Page

Figure 12: Record Detail Page

Figure 13: The Conway Library Help Page

Figure 14: The Conway Library Contact Page

Appendix D

User Manual

The Digital Conway Library

User Manual

Conway IQP Project Team
Worcester Polytechnic Institute

Last Edited: 01 March 2001

Introduction

Welcome to the Conway Library's database system User Manual. This document was created by the Worcester Polytechnic Institute project team as part of their Interactive Qualifying Project at the Conway Library. The intention of this manual is mixed. It has been created firstly to provide the staff of the Conway with a textual reference to guide them in the use of the database system we created. We understand that although they have been developed with ease of use in mind, unpredictable questions and problems could arise in our absence. Because of this we believe there should always exist backup help that can be called up instantly.

The first section of this manual explains with visual detail how to use the internal FileMaker system and external Web site developed for the Conway databases. The continuing part of the manual provides detailed insight into how to reproduce any of work done by the team. This section describes processing images and maintaining the web site as well as other miscellaneous, yet valuable information. Care should be taken to follow the instructions step by step in order to avoid problems later on. For questions or comments regarding this User Manual or the Conway Library database system please send email to conway@wpi.edu.

Operation of the Conway Server

This section of the user manual outlines the basic procedures necessary to bring the Conway Server online, from power-up to enabling the FileMaker web server. It is suggested that the server should be always running with FileMaker open in order for the website to be available on the Internet.

Starting the Conway Server

The server itself has built-in power management features that affect the method of powering up the server. Follow the proceeding instructions to turn the server on if it power is off.

1. If the server is off, first open the front door to the computer chassis. If it is locked, the key that came with the server will open this door. A duplicate copy of this key is located with Mr. Neil Grindley in Computer Services, Courtauld Institute.
2. Remove any floppy disks or bootable CD-ROM discs from the drive bays inside the chassis door.
3. With the chassis door open, press the rectangular button to power up the system. If the system is properly plugged into power and the power does not come on, disconnect the power cable from the rear of the chassis for at least 10 seconds, reattach, and try again.
4. Upon success, the system will power up and activity will appear on the computer monitor.

Logging On

The version of Microsoft Windows installed on the server permits that only users who have an existing username and password to the system may have access. Any concerns with logging onto the system, such as obtaining a new user account or reclaiming a lost password, should be directed to the system administrator, Mr. Neil Grindley, Computer Services, Courtauld Institute.

When the logon screen appears, the keys ALT, CTRL and DEL must be pressed simultaneously. The computer will then ask for your username and password. If the password or username is misspelled or incorrect, you will not be access the computer. At any time when the computer is not in use it should be kept LOCKED to protect from unwanted guests meddling with its contents. Do this by pressing the CTRL, ALT, and DEL keys simultaneously and choosing **Lock Computer** from the window shown.

Enabling FileMaker Web Publishing

In order to have the Conway collection accessible over the World Wide Web, the FileMaker Pro application must be running, and the database files (Archibri.fp5, Oldphot.fp5, and Manuscri.fp5) must be open. To protect the actual databases, there is a two-step process for the databases to be shared on the Internet. The actual databases that are used and edited in the Conway Library first need to be copied to a Web folder and then renamed from DBNAME to WEBSHARE_DBNAME. This avoids the problem of Internet users viewing the files while they are being browsed and changed in the Library. Complete the following steps to share the databases on the Internet, or to refresh the Web databases if they have been changed locally:

1. Make sure FileMaker is not running, if it is close the program before proceeding.

Publish DB to Web

2. Run the 'Publish DB to Web' program found on the Windows Desktop by double clicking on its icon. This will backup, prepare the database files, and open them up.
3. Remember to leave the three FileMaker files whose name (shown on the Titlebar of the window) has a prefix of 'webshare_'. This means they need to be opened to be accessible from the Internet.

By default, FileMaker web publishing is enabled. In the event that web publishing is not working an error messages such as the following might be returned to web users:

While this error message says that the file is not open, the actual cause of the error actually could one of two possibilities. The cause could be that the file has not been opened in FileMaker, or that FileMaker Web Companion sharing for that database file is not enabled. The former possibility is simple to fix, as it is just necessary then to open the file specified in FileMaker. For the latter cause of the error message, the user must enable Web Companion sharing of the database. To do this, complete the following steps:

1. Open the database file to be shared using **File…Open**. The database files are located in `C:\Databases`.
2. Within FileMaker, select **File…Sharing** and select the **Web Companion** checkbox to share the current database on the web. Do this for every database you wish to share over the web.

In the event that web publishing is not working at all, the FileMaker Web Companion plug-in is probably not enabled. To enable the Web Companion:
1. Select **Edit…Preferences…Application**.
2. Under the **Plug-Ins** tab, check the box next to the Web Companion Plug-In Name.
3. Click OK.

Using the FileMaker Intranet System

Each of the existing databases had been fitted with an easy to use menu and layout system. A layout is an arrangement of text, pictures and objects, which presents database information in an organised and customisable way. The system displays the most commonly used tasks as buttons on the visible window. This format was constructed in order to simplify the procedures involved in editing or adding information to the databases. No longer would someone have to spend great amounts of time looking through menus or hard to find areas of FileMaker for the most commonly used tasks in the program. The menu system provides the user with full searching capabilities, editing options, and various viewing alternatives. When a FileMaker database file is opened, a password screen will be shown. Leave the textbox blank to view and search the records, or type an administrative password for editing capabilities.

The Main Menu

Shown when any of the databases are opened, the main menu presents three basic database browsing methods and the help page.

Options
- Search Records – Opens the search window
- Browse Records as Table – Displays the full database as a table
- Browse Records as Form – Displays the full database as a form
- Help Menu – Displays the Help Page
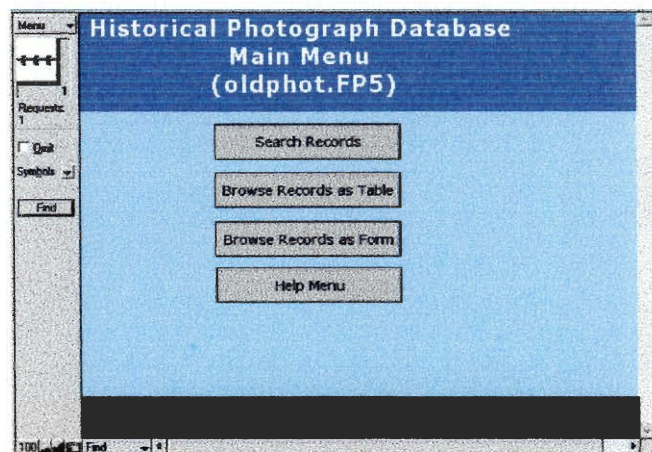
The Search Form

This window provides the user with various options to search the database. All the words in a single search page will be matched together (AND search). Adding information in a separate search page, or Added Request, will find records matching that page separately (OR search).
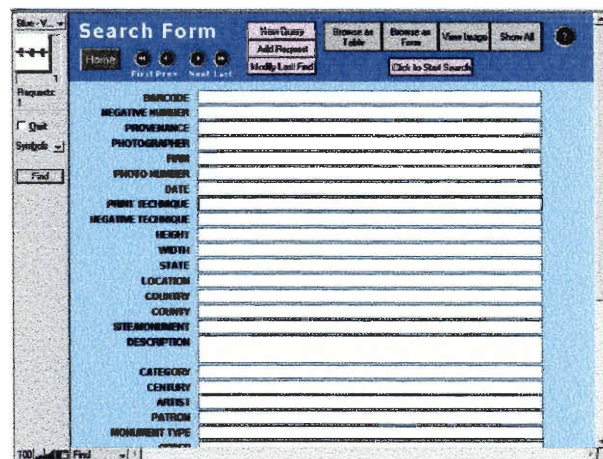
Common database options
- Home – Returns to the Main Menu
- First – Displays the first record in the present sort order.

- <u>Prev</u> – Displays the previous record.
- <u>Next</u> – Displays the next record.
- <u>Last</u> – Displays the last record.
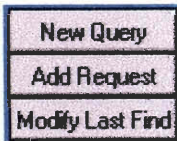
Search Options
- <u>New Query</u> – Clears previous search criteria entered.
- <u>Add Request</u> – Creates a new blank search request in which to add another set of data to find. The results of the search will provide results from the original query and the new request. There is no limit of the number of multiple search requests used and they can be viewed using the Next and Previous record functions.
- <u>Modify Last Find</u> – Allows the user to edit the data entered in the last search performed.
- <u>Search</u> – Begins the search process.

View Options
- <u>Browse as Table</u> – Changes the view mode to table layout.
- <u>Browse as Form</u> – Changes the view mode to form layout.
- <u>View Image</u> – Displays the digitised image in a new window (only in oldphot.fp5).
- <u>Show All</u> – Dismisses last search results and displays all records in database.
- <u>'Question Mark'</u> – Displays the commands help page.

The Table View

This browse mode is useful to compare multiple records at one time. Scrolling through records can be done using the Common Database Options or using the scroll bar on the right.
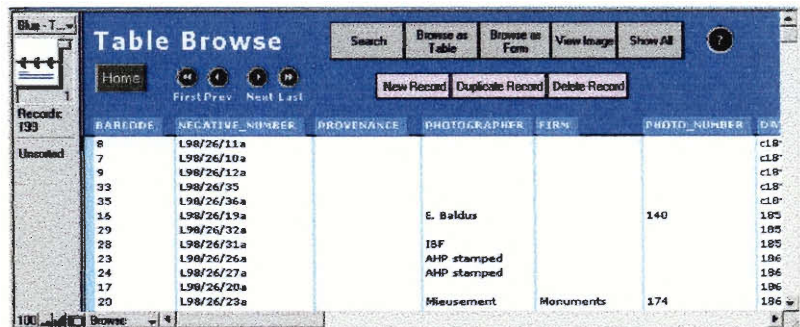
Common Database Options
- See *The Search Window* for common button descriptions.

Edit Database Options

- Note that the editing buttons will still be available if the administrative password has not been entered, however no actual editing can be done to the database.
- At any time clicking on a field and changing the written text will modify the record.
- New Record – Creates a new blank record at the end of the database.
- Duplicate Record – Creates a new duplicate record of the currently selected item at the end of the database. (Select a record by clicking in any of its fields).
- Delete Record – Completely removes a record from the database. WARNING: There is no way to undo this action.
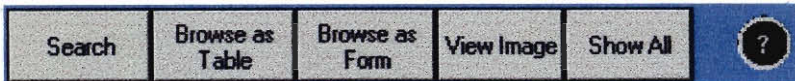
View Options

- Search – Displays the *Search Form* to search for records.
- Browse as Table – Changes the view mode to table layout.
- Browse as Form – Changes the view mode to form layout.
- View Image – Displays the digitised image (only available in oldphot.fp5).
- Show All – Dismisses last search results and displays all records in database.
- 'Question Mark' – Displays the commands help page.

The Form View

This layout is similar to the *Search Form* view in its full display of a single record utilising more viewable display area for each field. However this view option also has editing features.

All menu options for this layout are consistent with those of the table layout. See *The Table View* for more information.
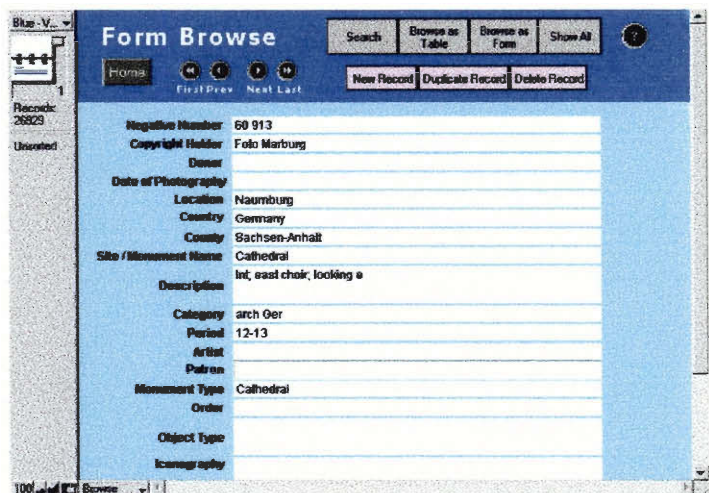
The Help Page

The help page has a visual listing of all the functions and buttons used in the layout. It can be accessed through the question mark in any of the previously mentioned layouts.
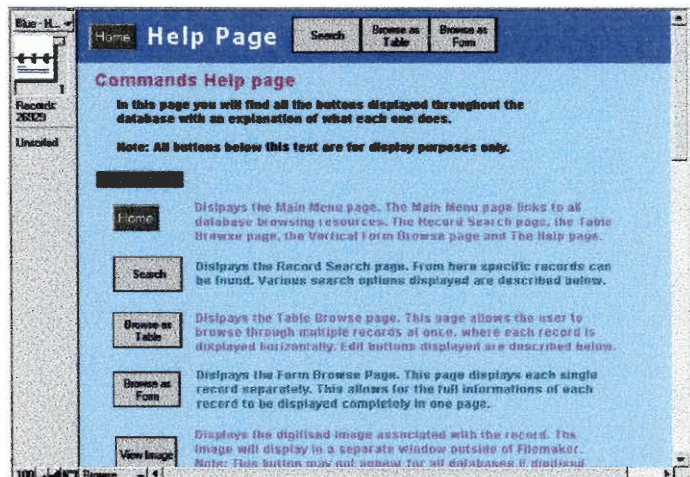
Using the Conway Library Website

The Conway Library website provides a method to share the great resources of the Library over the Internet. It has been made easy to use not just to scholars but also to those whose interest is sparked by these collections and choose to explore the collection. It uses a simplified, yet no less sophisticated search method than that of the internal FileMaker system. This allows for anyone to confirm the existence of specific material at the Conway, and to find what he or she is looking for quickly. The web site also provides a means to share with the world information on news and events at the Conway Library. This section outlines the basic functions and components of the website.
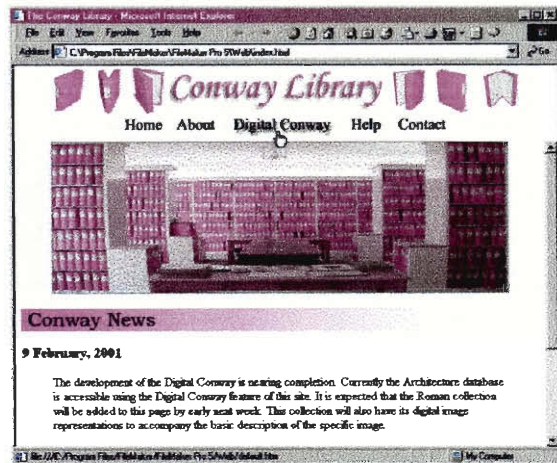
The Menu Bar

The menu bar is displayed in a fixed location above the Conway web pages. This enables users to quickly navigate around the website by selecting the titles in the menu bar. Each of the black text areas can be clicked to bring the user to that area.

The 5 options in the menu bar are:

1. **Home** – Is the first page that is displayed when the user enters the Conway Library website. It may contain an introduction to the website, new information regarding the web pages, the Library or the collections.

2. **About** – Contains detailed information about the Conway Library and its collections.

3. **Digital Conway** – The Digital Conway as we call it is the section of the website through which the collection databases can be accessed.

4. **Help** – The help page contains descriptions for all the pages in the website. It may also contain help regarding the use of the specific collections.

5. **Contact** – This page contains Conway staff contacting information. You may find here email addresses and telephone number to contact any of the staff working with the Conway Library.

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The Digital Conway

The **Digital Conway** section contains links to each of the search areas. Each of the collections has both a Keyword and Detailed search page which search the same database but in different ways.

In contrast to the FileMaker database search system, the website search methods are much easier to use. While in FileMaker the only way to search was to enter in each field what was desired, for the web a smaller amount of fields are used to search the databases. Also, the search operators AND & OR are an easy option set as part of the page, unlike the extensive procedure necessary in FileMaker to accomplish the same thing.
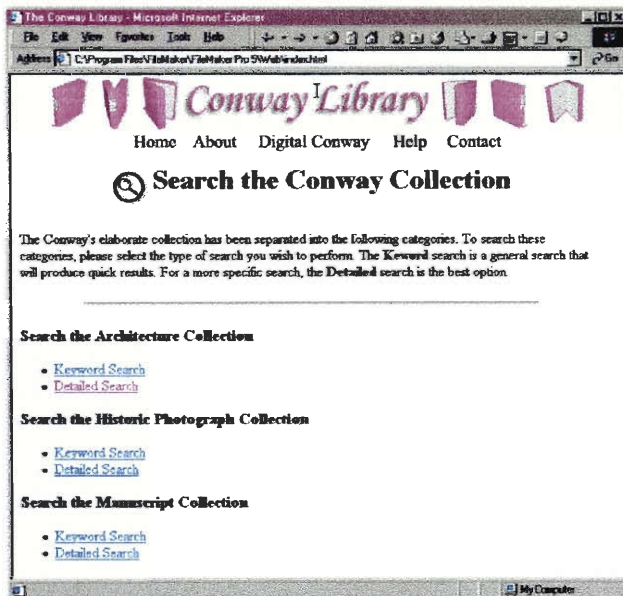
Keyword Search
The Keyword Search uses a hidden field in each of the databases, which summarizes the entirety of each record. This way any keywords can be found within the record. Choose the AND operator to match all the words typed or use OR to find all records matching any of the words in the box.

Detailed Search
Detailed Searches vary for each of the databases and are specific to the fields used in each database. All of the database fields do not appear on this page but are still used. A common example is the *Location* field in the Search page. This field will search through the database fields 'Location', 'Country', 'County', and 'Site or Monument Name'. This keeps the search page tidier and easier for the user to view and understand.

The AND/OR search option here performs a different task than the keyword search. In the Detailed field search the user can choose to find records that match all of the words entered in the search page (AND), or all records matching any of the words entered in the page (OR).

Search Results

This page displays a summary of each record and a small picture if it is available (when querying the Oldphot database). Results are displayed in groups of 20, with a link at the bottom of the page to see the next set of results. A defining link for each record is found at the top or left side (if with image) of each record summary. Following this link displays the detailed contents of the record.

Record Details

Clicking on a record will bring up this page. It details all of the database information for the record as well as displays (for the Oldphot database) a medium sized thumbnail if it is available. Clicking on the image will bring up separate window displaying a large version of the image.

Image Detail

This page is only available to those databases whose records have been linked to digital images, such as the Historical Photographs collection. The window opens in a new window from the record detail page and displays only a large "thumbnail" of the digitised image. This window can be set aside for comparison to other images or closed using the link at the top of the window.
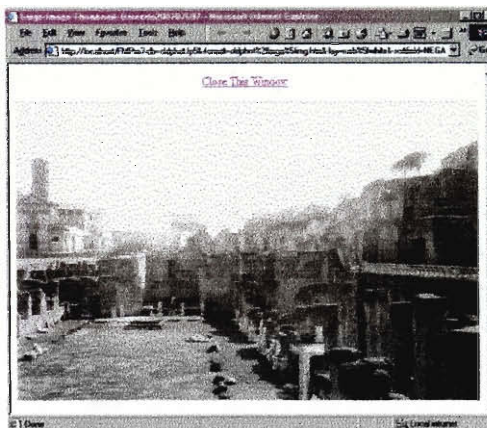
Editing the Database Structures

Each database has a specific database structure: a set of fields that describe each record, a few key fields used for website interaction, and different layouts which display the information in an efficient way. The previous section describes the layouts created by the IQP team for the Conway Library. All these items can be manipulated to simplify or improve user interaction with a database.

Layouts, for example, can be very helpful in directing a user through a database and making it easier to use. Many hard to find tasks in FileMaker can be simplified by adding an action button on a layout that will saves the time of rummaging through menus. Layouts can display the complex, and often unorganised information of a database in such a way that is easier on the eyes. They can also be used to display information in a useful manner, particularly when information has to be presented in a printed form, such as in labels or reports.

Creating a New Layout

In order to create and change layouts, the user must enter layout mode by choosing **View**…**Layout Mode**. Once in layout mode, a new menu appears named **Layouts** under which there are options to create new layouts, duplicate layouts, delete layouts, and change layout information (i.e. layout name), etc.
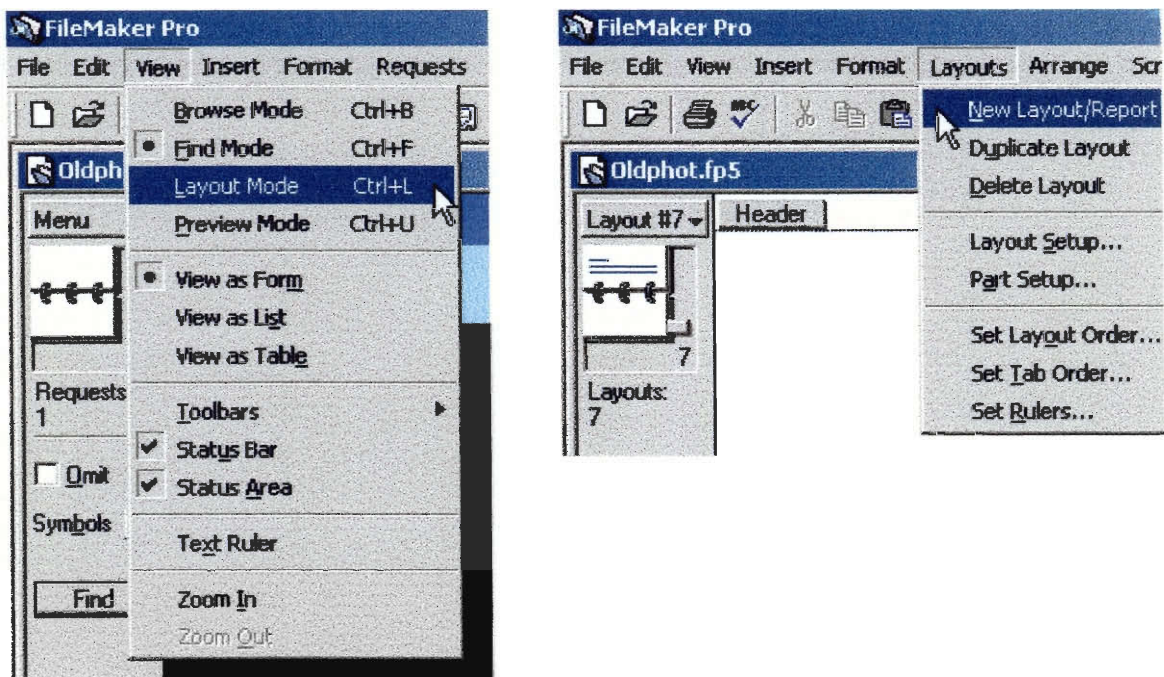
Selecting **New Layout/Report** under the **Layouts** menu will bring up the New Layouts Wizard, which guides you through the creation of a new layout. Following the instructions in this window will create a pre-fabricated layout with your selected fields and information. It can be used directly after working through the Wizard or can be edited further later.

Enter the name you would like to give to your new layout. In the text box next to **Layout Name:**, select the layout type and click next to continue with the layout wizard. Be sure to read all the instructions in the subsequent steps and click next when you feel you have provided the information the Wizard requires. In the event you feel there is no answer to a question from the Wizard, or are confused by it, simply press **Cancel** to exit the wizard, **Back** to see the previous window, or **Next** to skip the step and move on. You can always delete the layout later on by clicking **Delete Layout**, under the **Layouts** menu.
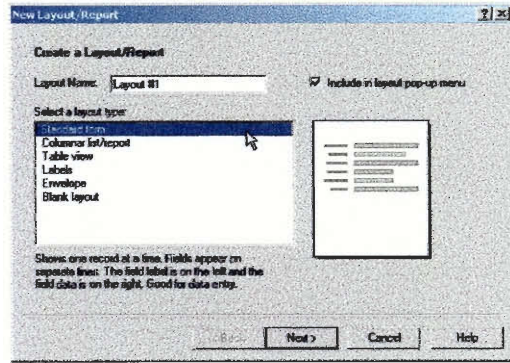
WARNING: Do not delete the layouts named **Menu, Blue-Vertical Search, Blue-Vertical Browse, Blue-Table Results, Web_White** and **Vertical** from the layouts menu as they are critical to the Oldphot.fp5, Archibri.fp5 and Manuscri.fp5 systems. Read below *Editing Layouts* on how to select layouts before attempting deleting any.


Layout Templates

- *Standard Form* – Shows one record at a time. Fields appear on separate lines. The field label is on the left and the field data is on the right. Good for data entry and single record viewing.
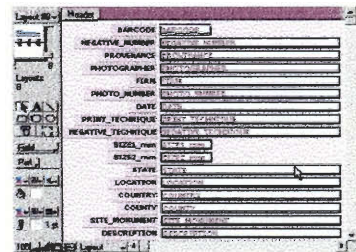
- *Columnar / List Report* – Sets up a simple columnar report or a complex report with grouped data and totals or subtotals. Shows records in rows and fields in columns.

- *Table View* – Shows a grid, with the records in rows and the fields in columns. You can sort, reorder, and resize the columns.
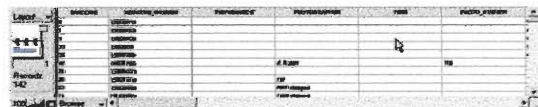
- *Labels* – Sets up mailing labels with the fields and text you specify. Choose from predefined labels or specify custom dimensions.
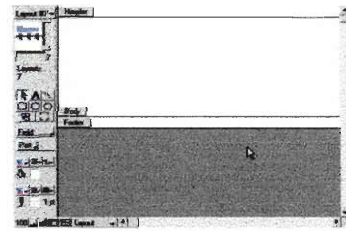

- *Envelope* – Sets up envelopes with the fields and text you specify.

- *Blank Layout* – Contains empty header, body, and footer parts. You can drag the fields you want onto the layout.

Editing Layouts

At any time in **Layout Mode** all tools necessary to edit a layout appear on the left hand side of the database window. The first button displays the layout that is currently in view. If you click it, a list of available layouts appears next to it. Clicking on any other layout name will bring up the layout in the window.

A general layout includes a *Header, footer* and *body.* The *Header* is always displayed at the top of the layout, and the *footer* at the bottom. The *body* is repeated for every record. For example in a table view the *Header* might include a title, the *body* a set of field boxes, which repeat for every record in the database, and finally the *footer* a copyright statement displayed at the bottom.
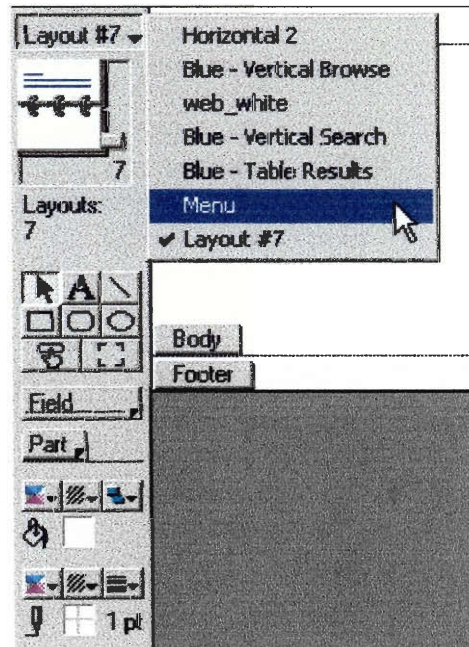
Tools

Arrow Pointer – is used to select items on the layout screen. Using the **Arrow Pointer** can move any objects, such as buttons or text.

- **Moving** - Select an object by clicking once anywhere over the object, then while holding the left mouse button down, move the object using the mouse and release the button to 'release' the object. The act of clicking, holding and moving with the mouse is also referred to as dragging.

- **Resizing** - To resize an object, using the same technique as with moving, drag a corner of the object with the **Arrow pointer** until the desired shape is attained.

- **Resizing Layout** Section - The **Arrow Pointer** can be also used to drag certain parts of the layout, such as the *Header, Body,* or *Footer* to allow more space in any of the sections. Simply click and hold any of the layout sections' display tags and move while holding down the mouse button.
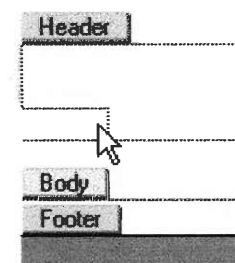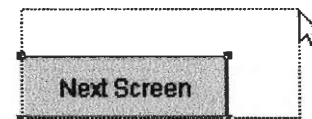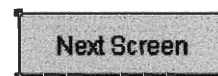
The Text Box – can be used to write text in any part of the layout. You can choose any size font or colour. Written text will appear fixed on the layout when viewing it in browse mode. Select the **Textbox Tool** by clicking on its icon once. Then click anywhere on the layout to start writing. You can move the textbox later on using the **Arrow Pointer**. You can also edit any text on a layout by selecting it with either the **Textbox Tool** or **Arrow Pointer**, and then selecting a change option in the **Format** menu, such as *Font, Size, Style* or *Colour.*

Shape Tools – For decorating effects, boxes, circles and lines can be drawn by selecting their appropriate button. Simply select a desired shape and drag the shape on the layout using the mouse button; that is, click and hold the left mouse button at the starting corner of your shape and move your mouse without letting go of the button to the end corner of your shape. Finally release the button to see the finished shape. Resizing and colouring of the shape can be done by selecting it (clicking on the shape once) and using the appropriate tool as described in this section.

Button Tool – is used to create a button that can produce any action within FileMaker, such as creating a new record when it is pressed. As with the shape tools select the **Button Tool** and drag the shape of a button on the layout. A window will appear displaying a list of FileMaker actions that can be activated by this button. For detailed descriptions of all the actions use the FileMaker help menu, or the official FileMaker User Manual.

Field Tool – creates a field space within the layout that will display the contents of a particular field for any record being viewed. To use the **Field Tool** simply drag the field tool from the menu bar onto the layout area. A window appears with the list of fields available in the database. Select the field to be displayed and check the box at the bottom of the window to automatically **Create a field label** next to the field (optional), and press the **Ok** button.
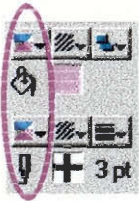
Shape and Line Colour Select – Select a shape on the layout with the **Arrow Pointer** and click on the colour button above the paint bucket icon to change the inside colour of a shape, or the background colour of a textbox. Similarly, do the same with the colour button above the pen icon to change the colour of the surrounding line of the shape or the line shape.
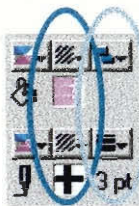
The second set of buttons chooses a texture for the colour. The third set defines extras for each tool. For the paint bucket the third button defines how the shape is displayed, i.e. embossed or engraved or plain. For the pen or line tool, the third button defines the size of the line used.

Descriptive Fields

There are many ways to describe records. This can be done using text, numbers, dates and others. Not only can they be manually changed but they can also be used as automatic fields. These might count up an ID number for example. Whatever way you want to use them, chances are

FileMaker has an option for it. Opening the **Define Fields** window (in the menu **File**, select **Define Fields...**) will display all the fields available in the database. Here you can create new fields, rename old ones or change the type of data that each field uses.
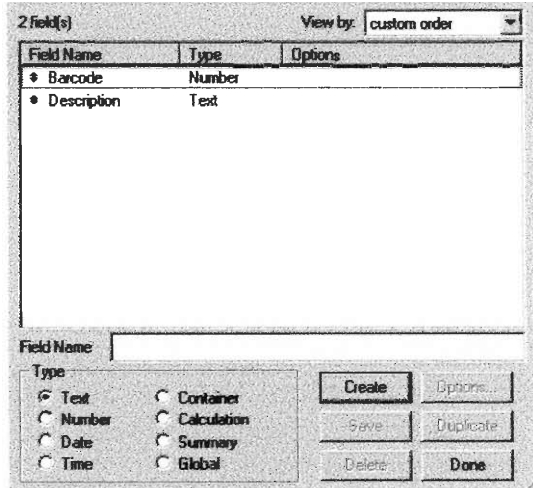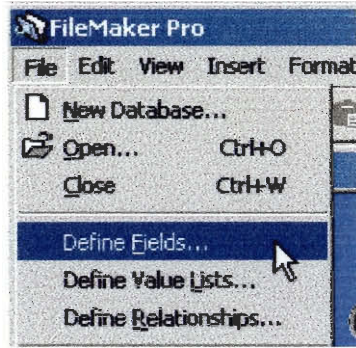
By using different field types, data can be standardised and kept consistent throughout the life of the database. Also some field types have some advantages over others. By using a strict number field to uniquely identify records for example, reordering in ascending or descending order is made easy. Furthermore, if fields strictly contain only data, and the formatting is done generically using layouts then the size of the database can be kept considerably smaller than if each field of each record contained all of the formatting.

Field Types

Text – Letters, numbers and symbols without any formatting constrains (i.e. Time format h:mm:ss)

Number – Numeric quantities on which arithmetic operations can be performed. (i.e. 5, or 1,850)

Date – Displays data only in date format, i.e. 06/03/2001.

Time – A time field contains the hours, minutes, and seconds corresponding to a time (i.e. 3:14:23).

Container – A container field can hold multimedia objects, such as movies, sounds or pictures. Container fields can either hold these objects as part of the database or link to them using a computer address. The later is often preferred because multimedia objects are often large in size and would subsequently decrease the performance of the database itself if they were physically added.

Calculation – The calculation field uses a user-defined formula based on written text, mathematical equations and/or other field data to 'create' data of its own. All calculations are done in the background by the computer and can be useful for analysis or just automation. An example is the Image Path field in the Historical Photograph database which uses the Barcode field and given information to create the path where the image for a given record is kept. The calculation result can be any of the here described field types.

Summary – Automatically creates a summary of selected fields in the database.

Global – Keeps one value that is repeated for each record in the database, but only uses the physical space of one value, keeping database space used down.

Notes on Adding, Removing or Changing Field Names

- Because layouts consist of unchanging objects, such as typed names, when fields are modified the layouts may not represent all changes done. The field display boxes will still represent a field if it is renamed but the typed text label for a field on the layout will not. If a field is removed from the database the data cannot be displayed. However if a new field is added, the layouts as we have set them up, might not show the new field unless it is manually added in **Layout Mode** (See Editing Layouts), or the user selects that newly defined fields be added to layouts. This can be done by selecting **Edit…Preferences…Application** and under the **Layout** tab, checking the option to *Add newly defined fields to current layout.*
- Similar to layout dependencies, any FileMaker websites which search the database will also be dependant on certain field names, and may cease to function if some fieldsor field names are changed. Also, the website we have created will require manual editing if fields are added or deleted (See Website Management).
- Fields names with a prefix "SR_" (i.e. SR_Keyword) used in Conway Library databases are Key Fields. They are automatically calculated fields, or *Calculation Fields,* which are used for special purposes. These should not be renamed or modified in any way, as it may cause problems in the website or FileMaker system.

Key Fields

Key Fields are fields used for special purposes in the Conway database systems. They are used for website searching or image path definition and are not displayed in the layouts as their data is repetitious and useless to regular users. However they are still used by the computer to automate certain processes, so special care should be taken when they are displayed. The only real way to view these fields is in the *Field Definition* window.

Key Fields that may be used in one or more of the databases:

'SR_Keyword' – Joins all of the fields to provide a full record keyword search.

'SR_Location' – Compiles all location related field, i.e. Location, Country, County, Site_Monument.

'SR_Person' – Compiles all fields where a person's name might be found, i.e. Author, Artist, Patron, Site or Monument Name, Iconography.

'SR_Object' – Compiles all fields relating an object description, i.e. Object Type, Monument Type, Site or Monument Name.

'SR_Technique' – Holds techniques used in both Negative Technique and Print Technique.

'SR_Large_Image' – Using the Barcode field and general location of images creates the path for each digitised image.

Creating New Databases

The creation of a new database requires preliminary planning. Before attempting to create a new database, it is helpful to make a list of what descriptive fields are necessary for the records that will be kept. Changing the fields in a database means having to change the layouts too, so it is important to do it right the first time. If you like how the present Conway databases operate you can also save time creating layouts and buttons by using the Conway Template database. The Conway_Template.fp5 file left by the WPI Project Team contains all the layouts used in the Conway Library databases: Menu, Search, Form and Table Browse, and Help page. It contains 5 descriptive fields, which can be changed, removed or added to, and 2 temporary records as examples. Another file, Conway_Template_w_Image.fp5, contains all these but also has the View Image feature found in the Historical Photograph database if digitised images are to be used.

To keep these templates for future use, please make copies of them and rename them as your new files before editing them. To make your own copy of template database:

1. Select one of the template files by clicking on its icon.
2. In the **Edit** menu of the Databases folder select *Copy*
3. In the folder where the database will be located select **Edit**...**Paste**
4. If the same destination folder is used, then the file will be named *Copy of Conway_template*...
5. To rename the new file select it with the left mouse button and select **File**...**Rename**
6. Type a new name, or edit the existing name in the icon text space
7. Click outside the file icon to finalise the change

When the template file is opened it will act as any of the Conway Library databases beginning with the menu page, and linking to the other pages. Using the instructions for *Editing Database Structures*, change the fields to represent your records. Then change each layout to display the desired fields. Unlike word processing software and a written document, FileMaker **will** save any changes done to the database instantly after they are done, so care should be taken deleting fields and records.

Notes on the View Image action:

- The View Image button requires the Open Image script, the SR_Image_Path calculation field, and the Barcode field to operate properly. All of these can be found in the Conway Library Databases and the Conway_Template_w_Image.Fp5 file, however for the template file the SR_Image_Path calculation field needs to be changed to properly indicate where the images are stored.
    - On the Conway Server Computer, in the D:\ drive (Open My Computer on Windows Desktop), there is a folder named *Digitised Images*. In this folder reside folders for each database in which the digitised images reside. For the Historical Photographs collection a full image path could be *D:\Digitised_Images\Oldphot\master_jpgs\20089898.jpg* (See Digital Image Formating).
    - For a new database create a new folder under *D:\Digitised_Images* named after your database or whatever folder used .

o In the Define Fields window of your database (See Working with Descriptive Fields) select the SR_Image_Path field and click on **Options**. This is the calculation:

"\\Conway\Digitised_Images\------DBNAME-----\master_jpgs\"&Barcode&".jpg"

Replace ------DBNAME----- with your database's image folder, and press **Ok**.

- The View Image button should now be operational, however it will ignore the command if the image is not available.

Digital Image Formatting

Upon completion of the digitising of the Roman collection by HEDS, the digital images were delivered on CD-ROM to the Conway Library. To ensure that the digital images would be of equal quality as the original photographs, the size of the resultant digital image files was large, between sixty and one hundred megabytes. While this level of quality is desirable for master copies and prints of such images, their file size makes it impractical for use on most personal computers. Because of this, the WPI team created image copies suitable for various purposes such as fast transfer on the World Wide Web.

From each digital image received from HEDS we produced a set of four images for use on the Conway server and over the web. The first image copy is a compressed master copy of each image, and the remaining three images were optimised for display on the web. The original digital images were delivered as 24 bit colour TIFF (Tagged Image File Format) images. Although the actual photographs are black and white, the photos are best encoded as colour images in the TIFF format to best represent the tones present in the photographic print.

For the images on the Conway server, we used the JPEG (Joint Photographic Experts Group) image file format for storage of the master image and web-optimised versions. JPEG is a widely used image format that takes advantage of known limitations in human visual perception to achieve significantly smaller file size with a visually imperceptible loss in image quality.

Size and Resolution

To completely avoid using the large TIFF files we have created full size version of the original files, compressed as JPEGs, which maintain the original image dimensions and pixel resolution. The process of saving in JPEG format, on average, reduces TIFF file sizes by a factor of thirty-five to one. For example an image of 70 megabytes reduces down to 2 megabytes. The full JPEG copies retain enough quality such that they may be examined on screen to equal visual detail of the TIFF files. **NOTE: For full quality prints the original TIFFs should still be used when possible.**

For the three image sizes made for use in the website, we reduced the images to significantly lower resolution and file size. In changing the image sizes for the three sets of web ready images, the WPI team processed the portrait and landscape-oriented images separate from each other in order to constrain them all to a square area, such that the web page structure is not disrupted. The portrait images were reduced to three sizes of 640, 330, and 120 pixels tall, and the landscape images were reduced to the same three sizes of 640, 330, and 120 pixels, but with respect to their width.

Among the three sizes, the smallest, or "thumbnail" size (120 pixels tall or wide), is used in the Conway database search results page. On this page the image files displayed are of sufficiently tiny file size that many can be displayed at one time. When one queries the site for a record detail, the user will encounter the medium sized image, measuring 330 pixels tall or wide for portrait or landscape photos, respectively. Finally, when viewing the record detail page, the user can call up a large version of the image, sized at 640 pixels tall or wide, respective of the picture orientation.

Automation of the Resizing Process

To automate the process of producing the necessary set of four images from each TIFF image we used Adobe Photoshop. A Batch Action in Photoshop opens each TIFF file and produces the full size JPEG and small, medium, and large thumbnails. The processing saves the processed images in a different location than the original TIFF files, as they are left unchanged. Below are the steps to follow to reproduce our results. Please Log in the Server computer using the Conway username before starting.

1. Copy TIFF files to be processed files into an empty directory on to the Conway server hard drive. For example double-click on **My Computer** and then the **D:** drive. Select from the menu bar **File**...**New**...**Folder**. A new folder is created, and it is highlighted. Click on the new folder to select it and within **File** select **Rename** to change its name; TIFF_files, for instance. Now that this directory has been created, the *path*, or location of this directory is *D:\TIFF_files.*

2. Enter the TIFF_files directory just created by double-clicking on it, and create a new directory within TIFF_files, by selecting **File**...**New**...**Folder**. Name this folder **portrait**; it will contain the images that are in portrait, or vertical format. The path to this folder is *D:\TIFF_files\portrait\.*

3. While still in the TIFF_files folder, select from the menu bar **View**...**Thumbnails**. The computer will now produce thumbnails for viewing all the files in the TIFF_files folder.

4. When all the thumbnails are displayed (the generation of thumbnails can take a few minutes), select all the images in portrait format by clicking on each image and holding down the CTRL key.

5. When all the portrait images have been selected, select **Cut** under the **Edit** menu to remove the images. Select the newly created *portrait* folder by clicking on it once, and select **Paste** from the **Edit** menu to place the images there.

6. Open **Adobe Photoshop** from the **Adobe** Folder in the programs menu.

7. In Photoshop, select from the menu bar **File**...**Automate**...**Batch**. The Batch processing window is now displayed.

8. In the **Set** field of the Batch window, select *TIFF Actions*. In the **Action** field, select *Image Convert – Portrait.*

9. Under **Source**, select *Folder*, and then click **Choose**. Locate the folder where the portrait TIFF files have been stored, such as D:\TIFF_files\portrait.

10. Leave the options *Override Action "Open" Commands* and *Include All Subdirectories* unchecked. Leave **Destination** set to *None* and **Errors:** set to *Stop For Errors*. The Batch window should appear as seen here.
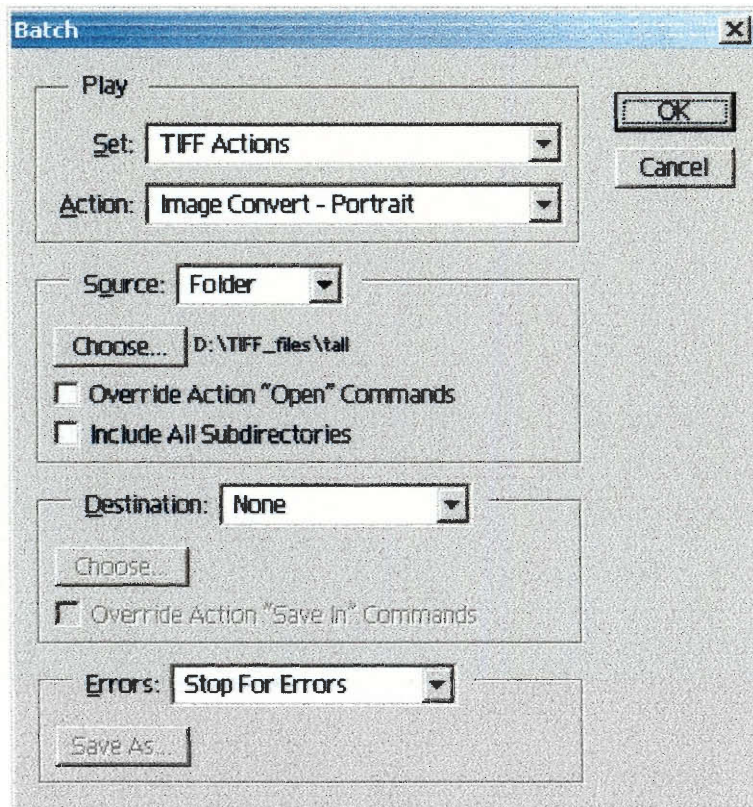
11. Click **OK**. The batch processing will begin as Photoshop opens each image and produces the compressed master copy and three thumbnail images from each original TIFF file. When this process is completed, activity within Photoshop will cease.

12. To process the landscape images, repeat steps 7-11, changing the chosen action to *Image Convert – Landscape* and the Chosen source directory as D:\TIFF_files\.

13. Finally run the Image Process program, by double clicking the icon on the Desktop. This will rename the images as necessary and place them in the database folder. The program will ask you to specify a database name. Use the general filename for the database such as oldphot for the Historic Photographs Collection or archibri for a The Architecture Collection.

The resultant images from this batch processing are stored in the following locations on the server: In the directory, [BARCODE#] is replaced with images' actual barcodes, and DATABASENAME is replaced with the name specified in step# 13.

1. JPEG Files, full resolution, located in:
   D:\Digitised_Images\DATABASENAME\master_jpgs\
   File Names: [BARCODE#].jpg (e.g. 200788236.jpg)

2. Large Size JPEG Thumbnails, 640 pixels, located in:
   D:\Digitised_Images\DATABASENAME \large\
   File Names: [BARCODE#]_1.jpg (e.g. 200788236_1.jpg)

3. Medium Size JPEG Thumbnails, 330 pixels, located in:
   D:\Digitised_Images\DATABASENAME\medium\
   File Names: [BARCODE#]_m.jpg (e.g. 200788236_m.jpg)

4. Small Size JPEG Thumbnails, 120 pixels, located in:
   `D:\Digitised_Images\DATABASENAME\small\`
   File Names: `[BARCODE#]_s.jpg` (e.g. `200788236_s.jpg`)

Placing Images on the World Wide Web

To make the digital images on the Conway server accessible to the web, they have to be placed within the FileMaker web tree, whose root directory is `C:\Program Files\FileMaker\FileMaker Pro 5\Web`, specifically within the `\db_images\` sub-folder. This is done automatically by Step# 13 in the previous section. Any directory and file references on the Internet are relative to this location. From the file `Web\oldphot\large_img.htm`, the following HTML tag can be found, showing the method used to link the digital images to the web site:

```
<IMG SRC="../db_images/large/[FMP-FIELD: BARCODE]_1.jpg">
```

This is an HTML image tag, it is opened and identified by '`<IMG`', and closed at the end by '`>`'. Between them, the location of the image is specified by '`SRC=`'. Within the quotation marks ("") the location of the image is specified relative to the root path of the web site. The full path on the computer of the image being displayed is:
`C:\Program Files\FileMaker\FileMaker Pro 5\Web\db_images\large\[FMP-FIELD: BARCODE]_1.jpg`.
The image is finally specified once the user requests this HTML file and specifies a record to FileMaker, at which point the CDML is replaced with the actual barcode of the requested record, and the user's computer can retrieve the appropriate image.

Website Management

For simple editing of the website, i.e. updating events or changing contact information, only simple word processing skills are required. Look below for the file you want to change under the FileMaker Web Tree, then using a web page editor, like Claris Homepage located in **Start**...**Programs**...**Claris Home Page 3.0**. open the file like it was a MS Word document. In the **File** menu, click **Open,** and find the folder specified for the Web Tree. Once the file is open, text can be edited by using the cursor and the keyboard. When the changes have been applied to the file, choose **File**...**Save**, and close the program.

FileMaker Web Tree

For user created files to be published over the web via FileMaker, they must be placed within the FileMaker web directory, or any subdirectories of it, to be accessible. The location of this folder on the Conway Server is *C:\Program Files\FileMaker\FileMaker Pro 5\Web*. Within this folder are 5 subdirectories:

- **Web\db_images**
  This folder contains three subdirectories: *small, medium,* and *large*. In these directories are the three sizes of thumbnail image files from the Conway's collection for the website, each indicated image uniquely identified in the filename by its barcode, and suffixed by '_l', '_m', or '_s' for large, medium, and small.

- **Web\site_images**
  This folder contains miscellaneous images used in the website, such as the graphic for the Conway Library website logo.

- **Web\archibri**
  This folder contains the HTML files necessary for searching and displaying records from the Architecture (Archibri.fp5) database.

- **Web\oldphot**
  This folder contains the HTML files necessary for searching and displaying records from the Historic Photograph (Oldphot.fp5) database.

- **Web\manuscri**
  This folder contains the HTML files necessary for searching and displaying records from the Manuscripts (Manuscri.fp5) database.

General Web Files

- Index.html – The first page shown when the Conway Library website is opened through the Internet. This page is made of two separate pages: Topframe.htm and Main.htm.
- Topframe.htm – Is found always at the top of the Conway website. It contains the Conway Library title in large letters and below it links to the other pages in the website.
- Main.htm **(Home Link)** – The first page seen by an Internet user. May contain any general information regarding the Conway. A suggested use is to update it frequently with News and Events at the Conway Library to attract more users.

- About.htm (**About Link**) – Contains more detailed information regarding the Conway Library, its collections, etc.
- Default.htm (**Digital Conway Link**) – Home base to the database search engines. It contains links to all the search pages found in the website.
- Help.htm (**Help Link**) – The help page for the website. Describes the website in more detail. Could be used as well as help regarding the collections, such as containing a glossary of obscure terms in the databases.
- Contact.htm (**Contact Link**) – Has contact information for staff at the Conway Library.

Database Files

- Searcha.htm – Advanced search page. It contains several fields in order to search in detail through the database. Fields with a prefix of "SR_" are specifically for searching purposes and do not appear in the search results or in the database. These fields are compilations of multiple fields to keep the detailed search simple.
- Searchk.htm – Keyword Search Page. Contains one textbox referencing the SR_Keyword field, which in any given database contains all the information from each record.
- Search_error.htm – Contains an error message that is displayed when no records are found.
- Search_results.htm – Details how the search results are to be displayed. Between the [FMP-RECORD] tags the entire HTML is repeated for each record.
- Record_detail.htm – Defines how a detailed record is presented. All the fields for one record are shown and for Oldphot an image is displayed alongside.

Although most of the web site is static, that is they are unchanging text documents, the FileMaker search pages depend on the database it searches, and the structure it uses. It requires the name of the database, the field names it searches, as well as the layout it uses to be consistent with what is specified on the page. These "dynamic" pages, as they are called, use a special language created by the FileMaker company Claris.

The Claris Dynamic Mark-up Language (CDML) makes it difficult to use common Hyper Text Mark-up Language (HTML) editing programs because the software does not often understand how it works. This is why we recommend using Claris Homepage to edit the Conway Library website as it 'speaks' the language of these pages.

CDML Tags

Within the HTML files used for the Conway website you will see the proprietary FileMaker Pro tags known as CDML. While HTML tags are visually identifiable by their use of angle brackets in tags such as `<html>` and `<p>`, CDML tags are identifiable by their square brackets, such as in `[FMP-FIELD: RecID]`.

When a user requests a web page, the FileMaker software goes through the HTML file requested looking for CDML tags. The FileMaker software treats the CDML tags as instructions on how to deliver the web page with the data that the user requests. For example, if a users requests an HTML page containing the CDML tag `[FMP-FIELD: BARCODE]`, FileMaker will replace the tag itself with the numeric barcode for the appropriate record. For a full range of tags and explanations within the Claris Homepage software, simply open the CDML tag reference under **View**…**FileMaker Reference Library**.