

18 Image Collections in the Design Studio

Dave van Bakergem

Urban Research and Design Center
School of Architecture, Washington University

No matter what the medium, architects are constantly using images in all aspects of design thinking. Whether it is the perception of the environment, an image in the mind's eye, an abstract drawing or a photographic record, designers use images to conceive of, and manipulate their design ideas. Managing these image collections occurs at a variety of levels in the creative process and is dependent on the type of image that is called upon for reference. The most basic example would be the image collection residing in the mind's memory which is a result of the designer's world experiences and the relative impressiveness of each experience. Clearly, personal memory plays a significant role in the use of imagery in design, but it is unreliable and can be abstracted in uncontrollable ways. The sketchbook and later photographic collections of the grand tour were the beginnings of efforts to manage and utilize image collections as an aid to drawing and thinking about design. Now the capacity to use electronic means of creating, altering, storing, and retrieving images will enable designers to effectively use large image collections in ways that have not been possible before.

This paper describes current work at the School of Architecture at Washington University in a graduate design studio. The students use a powerful 3D modeling CAD system (HOKDraw) to design and present their studio projects. In addition, we are experimenting with an image storage and retrieval system which is directly linked to the CAD model through a relational database (INGRES). Access to the database and images is instantly available through the command language and graphic display. The CAD model in effect becomes a 3D menu to an extensive image database stored on an optical memory disc recorder.

Several collections are available to the studio members: the library's slide collection which relates to the studio project, specific photographs and drawings of the project site, and personal image collections stored by

individuals for their own reference. The commonly accessible images are basically background material and images collected by the students to document the site, urban context and building typology. The personal images collections are any images (drawings, photographs, published images, CAD images) created or collected by the students for purposes of informing their design thinking.

This work relates to the use of precedents and typology in architecture as a point of departure as well as in development of design ideas.

Introduction

What is the source of design ideas? Clearly this question is not easy to answer but it is safe to assume that designers bring to each project a set of enabling prejudices and corresponding enabling images. These prejudices and images are derived from world experiences and are stored in memory to be called on in the mind's eye. A mature, experienced designer may have a vast and extensive collection of images which provide a source of knowledge about a place, about architecture, about formal concepts, etc. An architectural student may have a comparatively tiny collection to call upon as a source of ideas from outside the problem context—a handicap in part overcome by the usual rush to the library at the start of a studio. These trips to the library are documented by copies of *relevant images* which form the beginning of an image collection for a design project. Tack boards fill up, work areas become scattered with photos, drawings and other images. The use of images can be compared to the use of study drawings which play an *essential role* in thinking about design but are mostly used by habit and circumstance rather than organized and managed in any coherent way. Once *completed*, study drawings join the collection which provides a short-term pool of images to back up design activities. The process is informal but it is a critical part of building the knowledge which a designer brings to a project.

An attempt to manage this process of building an image collection for a design project was *recently pursued* in a graduate design studio. The project was the recent ACSA student design competition "London: Designing in the Historical Context". Five students participated in the studio for which the program was a large mixed use commercial development on the Thames River just west of the Tower of London. Part of the studio's tasks was to create an image collection which would be shared over a computer network and would be project specific. The objective of the *experiment* was to explore the role that images play in design when a small group focuses on the same problem and *develops both* a communal and personal image collection.

The process of formalizing and managing the collections raised issues of terminology and typology. Labels, notes and terms were required for both communal and personal collections. The act of naming an architectural object is a process that typifies through language. Through the process of assigning names and labels the images were grouped by certain inherent similarities and the students faced some fundamental issues of typology. The use of images as a vehicle to explore types was not meant to *encourage a literal copy-and-paste approach to models but to encourage an interpretive approach-to seek the essential elements that provide an idea for change or transformation.* In *On Typology*" Professor Rafael Moneo wrote "*Architecture... is not only described by types, it is also produced through them. If this notion can be accepted, it can be understood why and how an architect identifies his work with a precise type. He is initially trapped by the type because it is the way he knows. Later he can act on it; he can destroy it, transform it, respect it. But he starts from the type. The design process is a way of bringing elements of a typology-the ideas of a formal structure-into the precise state that characterizes the singular work.*" Typology as a point of *departure is a powerful teaching tool which can be effectively enhanced by the use of image collections.*

Types of Collections

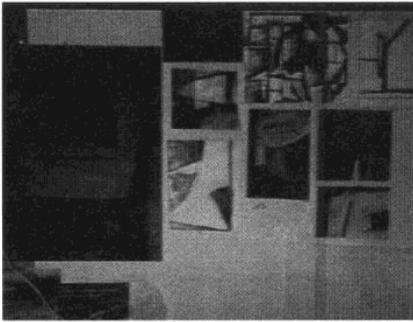
Three types of collections can be identified: general, communal, personal. These types can be distinguished by the sorts of images included in the collection and the purposes for which they were collected.

General collection

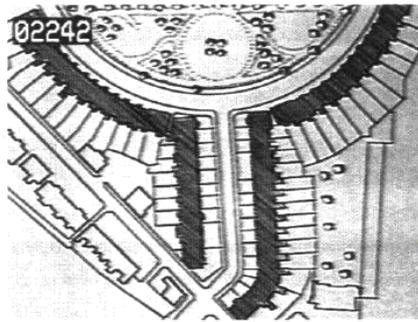
This type is a collection which attempts to be comprehensive for a specific discipline. Typically, a library's slide collection is a general architectural collection which provides basic reference images for a wide range of subject matter and is organized by building type, architect and/or location. The architectural periodicals in the library could also be thought of as a general collection.

Communal collection

This collection is the central project-specific image collection to which all members of the studio make contributions. It grows as more information is gathered and includes site documentation, local and regional history, building types and other images and is meant to be a shared resource for all users. It is located on the disc in a designated location with expansion room.



Studio tack board



Crescent type



Studio tack board



Image from library collection



Site documentation



Tower Bridge



London Custom House



Geo-referenced image -All Hallows Church

Personal collection

The personal collection is a group of images which may only have meaning to the designer

Functional types

Images of buildings or special rooms which the user might wish to record as an example of a functional type constitute this category. For example, in the studio the program called for hotel, office commercial and retail commercial space. Students collected images of these building types in an effort to understand the range of typical forms that these building types might take.

Well-known places

These images might be part of the designer's personal collection of places that are used for references of scale and sense of place. Places that are known from personal experience might be local places which have been recently visited or which are frequently encountered, such as a local urban plaza or university quadrangle.

Impressionistic images

These images are the most open-ended and free of any literal interpretation. Images which provide any reference for the designer in the most personal manner might be included in the collection. For example, a late nineteenth century painting of boats in the river might provide a point of departure for architectural form.

Designers' sketches

Designers produce images in the form of sketches, drawings, collages and models. Schematic sketches and other study drawings can be made part of the on-going collection process in which progress toward the final design becomes part of the collection. Looking back at early sketches is a common technique for designers when faced with an impasse.

Image Collection System

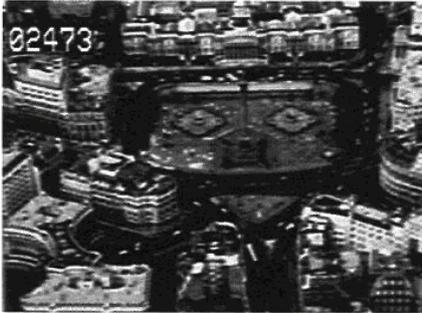
The image collection system is essentially a hypermedia environment in which the CAD window is the primary access to graphics and text. It is a working environment which provides links between images, text and three dimensional CAD models. The most significant aspect of this system is the connection between graphic objects in the CAD model and photographic images stored on an optical disc. The CAD system used for this project is HOKDraw and it has



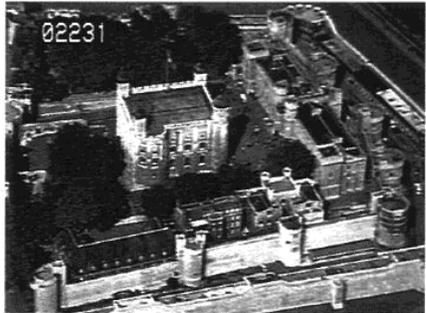
Reference project from personal collection



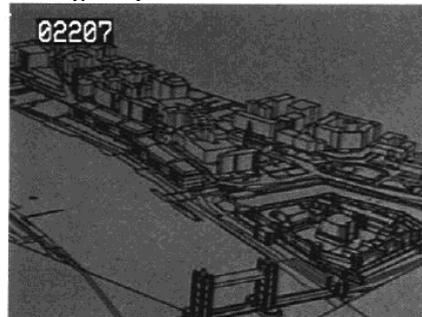
19th century painting / river edge



Trafalgar Square



Tower of London



Student sketch of project site



Image in personal collection



Figure ground project site



St. Paul's Cathedral

access through its command language to Ingres, a relational database. Lines polygons and symbols in libraries can be linked by unique identification numbers to entities in the graphic database. This functionality is common in many CAD systems and seems to be most frequently used in facilities management applications and other applications in which attributes are assigned to polygons and other graphic entities. In the image collection system those attributes include a videodisc frame number which links the entity to an image as well as text files, labels, keywords and notes. With this connectivity, any symbol or part of a CAD model can be linked to anything that can be photographed including motion video with stereo sound.

The image storage device used was a Panasonic Optical Memory Disc Recorder which is a direct read-after-write NTSC video medium. The capability of recording single still frames from any NTSC video source made it a convenient and easy-to-use device. The disc capacity is 24,000 frames of high resolution, full color video. Search time for any frame is less than two seconds and it can play image sequences at any speed up to 30 frames per second. The analog videodisc medium was chosen *because of* the large capacity and its capability of rapidly displaying sequences of images which permits the important function of browsing the disc. Image input was accomplished by a high resolution video camera on a copy stand and a video slide processor. This set up permits flat artwork, photos, images from books and periodicals, drawings and color slides to be quickly transferred to the video disc.

The CAD program runs on a local area VAX cluster (Vaxstation 2000's). All functions of the CAD program, the relational database and the videodisc player/recorder are controlled through the command language or pop-up menus in the CAD program. CAD images are displayed on the workstation monitor and images from the videodisc are displayed on the NTSC video monitor.

Using the Collection System

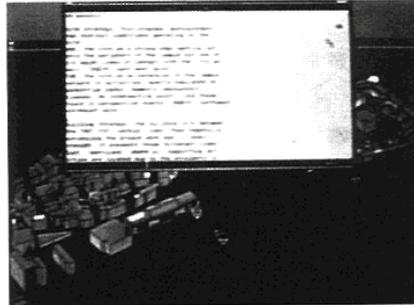
There are two basic modes in using the system: building the collection and searching/ personalizing the collection.

Building the collection

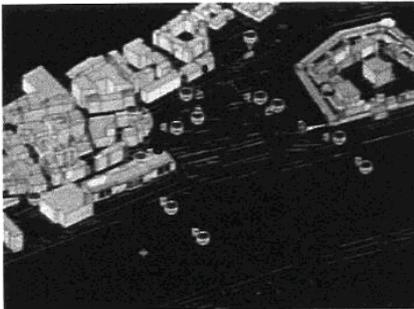
Recording images, inputting symbols and creating links are functions with which the users establish their studio collection. In order to *encourage extensive use* and to discourage early elimination of images in the preselection process the system was set up to be as convenient as possible with the copy stand and slide processor constantly available in the studio. Any image *created in* the studio, found in a publication or recorded on the site could easily be included in the collection. The links to the graphic database *were accomplished* by inputting a graphic symbol with a name *related to* the class or subclass of



Garden gate



Text file window associated with image



Symbols for geo-referenced image

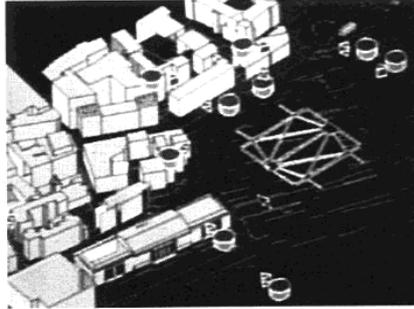
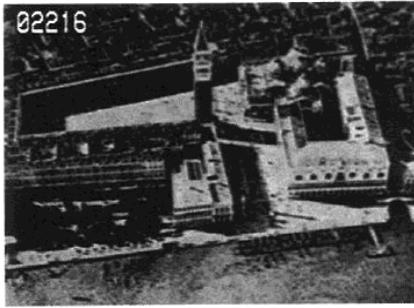


Diagram of urban plaza linked to image



Pop-up menu for image selection



Piazza San Marco / well known place



Image from personal collection



Early London map showing site

images, for example, arcades, entries, St. Paul's. The shape, size and color of the symbol provide visual cues as to the type of image to which it is linked. For example, photos of the site which are geo-referenced images were linked with an arrow indicating the location of the photographer and the direction of the photograph. Links to the relational database were accomplished by Ingres's query-by-forms function which allows the user to make notes and labels associated with each image or group of images. These notes and labels would become one of several means of selecting the images by keyword searches. The label field was established as an objective description of the image, such as "Kew Gardens;gate" while the note field was left open for subjective, personalized adjectives and nouns which the user might find useful in returning to that type of image, such as, "grand entry; best example".

Searching/Personalizing the Collection

There are several types of actions which a user might take in searching the collection: selecting symbols in the graphic database, performing a keyword search of the tables in the relational database and browsing the image collection on the videodisc.

Selecting symbols provides a direct link to a single image or group of images. The user graphically picks a symbol or polygon, a pop-up menu displays the images' labels associated with that symbol, the user selects a label, and the video monitor displays the image while a workstation window displays the text file associated with that image. Other display options include a sequence such as surrogate travel through the site. Photographs of the site, historic drawings and maps, plans of an existing church, and other miscellaneous photos were available to the students in the studio through the graphic selection mode. Other applications might include the creation of an abstract memory place that may or may not be associated with the specific place in which the project is located. Personal drawings and images could be linked to objects in three dimensional space in a "memory annex" to the projects physical description and the designer's own mental memory.

Keyword searches of the tables offer another means of selecting images from the collection. Because of the small, specialized nature of this collection, the terminology conventions for labels were kept very simple by identifying the images according to functional types, place names and, possibly, location; these labels were typically assigned to the images by someone other than the users (labels on slide mounts, captions from publications, an editor's judgement). On the other other hand, the notes field was allowed to consist of highly personalized descriptions-based solely on the user's terminology, as though no one else would ever use the collection. Note fields can be edited and amended as the user's understanding of the collection matures.

The browsing function permits the users to rapidly display the images in the sequence in which they were recorded on the disc-visually scanning the collection at speeds up to ten frames per second. Within the browsing mode the user can select an image and view the associated database (labels, notes, text files).

Personalizing the collection is accomplished through a process of progressive elimination and the creation of tables of images created for a specific purpose. By means of a "like/don't like" choice the user can create a temporary subgroup of images under a new name. For example a small subgroup might be started under the name "my plaza" and images selected through a keyword search or browsing the disc might be included. The collection could be added to over time and reviewed at any time by requesting the display of all images in "my plaza". These small sub-collections were meant to be specific and personal and not necessarily shared over the network.

One powerful selection mechanism was the connection of an image to a symbol in the CAD library, which can then be placed in the graphic model. This capability was used as a means to compare the scale and size of well known places to the project site. For example, a user might search the collection with the keywords "urban plaza" and find an image of the Piazza San Marco; selecting the image the CAD system calls up an abstract diagram of the Piazza which the user places in the location for the desired comparison. Both the diagram and the photograph can be viewed at the same time. A future development might include an image collection associated with an extensive knowledge base of architectural and urban elements that could be selected by searching an image database of the objects' form at default parameters.

Summary

As the concept of hypermedia working environments expands to include the discipline of architecture and urban design, quick and easy access to large image collections will become an integral function of the designers workstation. Linking images to the graphic data permits the working model to become a dynamic 3d menu for organizing information about a project and providing students with a powerful tool for developing their personal image collection both on the workstation and in their minds.

References

Herbert, Daniel. 1988. "Study Drawings in Architectural Design: Their Properties as a Graphic Medium". *Journal of Architectural Education*. Vol. 41. Number 2. Winter

Moneo, Rafael. 1978. "On Typology." PP. 22-45. *Oppositions* 13.. Published for the Institute for Architectural and Urban Studies. Cambridge: MIT Press.

Rowe, Peter. 1987. *Design Thinking*. Cambridge: MIT Press.

Soergel, Sagobert. 1985. *Organizing Information: Principles of Database and Retrieval Systems*. New York: Academic Press.