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Using 3D Animation to Assist the Fundraising for a Building's Addition to the Worcester Art Museum

An Interdisciplinary Qualifying Project Report Submitted to the Faculty of Worcester Polytechnic Institute In partial fulfillment of the requirements for the Degree of Bachelor of Science

By

Jarallah Aljarallah

Rassem Merhi

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Approved:

Professor G.F Salazar

Abstract

The Worcester Art Museum (WAM) is raising funds for the construction of a new addition to its building. This project reviews the need for the new addition and explores the use of 3D animation as a tool that may help WAM in raising the funds for its construction. Also, this project examines the museum's past fundraising drives and analyzes the influence of using Virtual Reality on different applications. ~~And~~ It proposes the use of Virtual Reality to improve the functionality of the WAM's fundraising. Three-dimensional (3D) drawings and a prototype 3D fly-through animation of the animation were created, presented and given to the WAM.

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Acknowledgement

The project partners acknowledge the contribution and the efforts of professor G. F. Salazar, the project advisor, who guided this project to be the way it is. We also acknowledge the WAM personnel who took some time for the interviews that we had with them, responded to our questionnaire, provided us with the drawings, and attended our presentation.

Letter of Authorship

This project was equally divided among the three project partners:

1) Jarallah Aljarallah

2) Rassem Merhi

3) Edwin P. Jacques.

Each one of the project partners contributed an equal portion of the labor for this project.

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Introduction

The Worcester Art Museum (WAM) is raising funds for the construction of a new addition to its building. This project aims to augment the WAM's fundraising techniques through the creative use of Three-dimensional (3D) animation.

3D animation is a tool that can help the user achieve many things that are much harder in real life. 3D animation is an effective, precisely targeted, exacting communication tool. 3D animation can put advances in the field of psychology, communication psychology, medicine, engineering, construction and marketing sciences.

Getting potential donors interested in funding a proposed construction project is a major problem. Typically, construction projects cost several million dollars, and the WAM annex is no exception. According to the WAM estimates, the annex is going to cost around $6,600,000. Whether the fund providers are business owners, government agencies, foundations or philanthropists, these donors need to be convinced that their money, perhaps hundreds of thousands or even millions of dollars, is going to be put to good use. In the words of Ms. Jan Spitz, the former Deputy Director of Development and External Relations at the WAM, it is necessary to "get people excited, [and] make the project as real as possible. Make the project 3D with words. Visual representations help so much more." Therefore, the ability to visualize is in the core of this project.

This project is an effort to identify, use, and evaluate virtual reality's technology in the aspects of visualization, scale models and architectural renderings. In doing so, potential donors develops a much better understanding of how the museum will "look and feel" when finished. This building-user interplay is expected to motivate the potential donor to increase his/her contribution to the WAM.

This project improves the potential effectiveness of using virtual reality to get fund donors excited about giving money to the WAM. The final will be 3D rendered images, and animated "fly-through" movies of the WAM, showing how the WAM looks now, and most importantly, how the WAM *will* look when the annex is constructed. This should give the donors a much clearer perspective of where their money is going to be.

To the best of the partners' knowledge, this project is the first of its kinds in the terms of using 3D animation for fundraising purposes. The technologies being discussed in this project are still swiftly evolving, case studies and formative evaluations are the only resources available. Moreover, these limitations are intrinsic in any attempt to depict the future of a field.

In this project, we would like to create a mental model to the potential donors using 3D animation by creating animations of the museum with and without the new addition and to create a fly-through of the new addition. By doing so, the potential donors will have a mental model and according to their models they build their actions. In this case, their reaction is going to be donating to the WAM or not.

By using 3D animation, this project utilizes an emerging communication science to create a more effective image for the WAM audience, or enhance the impact of the WAM current marketing program and marketing materials. This project by using 3D animation is an effort to improve advertising campaigns. 3D animation calls on a spectrum of ancient, contemporary and futuristic sciences to achieve greater effect, understanding and growth in all aspects of life and business.

Measuring the effectiveness of using 3D animations for fundraising purposes is beyond the scope of this project. However, below is the feedback of the WAM personnel after the final presentation of this project. For more details about the WAM personnel whom attended the presentation or about the questionnaire that was given, please look up Appendix E.

The overall feedback from the WAM personnel was as follow:

- The idea of using 3D animations for fundraising purposes is an interesting use of this technology that deserves to be explored in more details. Moreover, the WAM personnel think that 3D animation will be efficient if to achieve other targets for fundraising and marketing purposes for the WAM.

- That people are interested in "seeing not just hearing about" the future plans of the annex. And if the 3D animation that was done in this project could be developed to be more realistic, it will be definitely of good use for fundraising and marketing

purposes for the WAM. Because the WAM's marketing techniques will be more efficient by using 3D animations to convey the message to the potential donors by being able to share the WAM plans with them.

In addition to the uses of 3D animation for fundraising and marketing purposes, the WAM personnel think they can have other uses from this project such as:

1. The WAM is developing a web-site. And the 3D animation that was done in this project can be used as a tool to advertise the WAM by hosting the animations on the museum's web site.
2. Since the 3D drawings and 3D animation in this project are architecturally accurate, the work that was developed in this project would be best used for envisioning the WAM master plan. In addition, the WAM can give the 3D drawings to the companies that they would hire so they can use them for planning future construction projects.
3. The WAM personnel think that this project allows them to explore other museum projects that might benefit from this kind of technology. Moreover, they mentioned in the final presentation different ideas of using this technology for the benefit of other areas in the WAM.

By the time of the final presentation of this project, the WAM have contacted 85% of their potential donors Therefore, the effect of using 3D animations for the current fundraising campaign is unknown. However, the 3D animations would help the WAM bring together more potential donors and make them interested in the annex

because they would have the opportunity to "see and feel" the future use of their donations.

The best way to measure the effectiveness of using 3D animations for fundraising purposes is by getting feedback from the potential donors who see the 3D animation. If they see it, like it and donate money to the WAM, then it must be effective.

Background

The Worcester Art Museum is raising funds for the construction of a new addition to its building. This project reviews the need for this new addition (annex) and explores the use of 3D animation as a tool that may help WAM in raising the funds for the addition. In this project, we examine the museum's past fundraising drives, and analyze the influence of using Virtual Reality on other businesses. Then, we propose how Virtual Reality can be used to improve the functionality of the WAM's fundraising. We have created a 3D fly-through animation and rendered images of the new addition to assist the WAM with raising funds.

The purpose of this project is to explore the added value of the use of multimedia to the Worcester Art Museum in raising funds for the new addition to the existing building. This project may help the WAM to use the 3D animations as a way of convincing the donors to give financial support to build the new addition. At large, this project illustrates how modern information technology such as 3D animation can be used for the benefit of society for fundraising purposes.

In this project, we design a virtual reality presentation for the proposed addition using AutoCAD drawings and 3D Studio MAX animations. This project uses AutoCAD to build our 3D model from the existing 2D drawings. 3D Studio MAX is used to do the animations for the museum with and without the annex. We followed this procedure upon

the results from investigative research of 80 companies. These companies are specialized in building 3D models and doing animations for construction purposes.

Virtual reality is a new media that enables new types of messages and experiences to be conveyed to the audience through computers. The innovative use of Virtual Reality as a presentation method to attract more fund donors is a new idea that needs to be proven.

Because the technologies discussed are still swiftly evolving, case studies and formative evaluations are the predominant types of research materials available. However, these limitations are intrinsic in any attempt to depict the future of Virtual Reality. How information is created, delivered, and used in business, government and society is swiftly changing, so this project must incorporate into the recent experiences with creating and utilizing new forms of expression, such as multimedia and 3D animations.

In this project, we have been trying to identify, use, and evaluate virtual reality's uses for fundraising purposes. In doing so, we are beginning to understand the interplay between virtual reality's features and other important factors in shaping the desired image.

Methodology

The 3D animation was created out of the two-dimensional (2D) electronic drawings using AutoCAD R13.[1] Then, the 3D drawings were extended to 3D drawings. With the use of 3D Studio Max R2[2], a prototype-animated walk-through of the annex building was done as a proof of concept. The 3D drawings as well as the 3D animation electronic files are attached to this report.

Procedure:

The technical aspect of this project is the application of 3D animation to this problem. Below is the method that was used to approach this project.

We converted the existing 2D AutoCAD drawings into 3D AutoCAD drawings. First, we got the 2D drawings and the blue prints- maps from WAM. Then, we updated the 2D drawings. And then we created our 3D model.

We visited the WAM and took pictures of how it looks so that the appearance could be best recreated. We created a model from the outside of the whole museum. We also created a model from the inside of the entrance to the museum (Lancaster Street Entrance) before and after the annex is added. Finally, we created 3D animated "fly-through" of the WAM from the outside, and inside the Lancaster Street entrance, before

[1] Trade Mark by Autodesk Inc.

[2] Trade Mark by 3D Studio Inc.

and after the annex is added.

A tutorial explaining in more details how AutoCAD R13 was used to extract 3D drawings from 2D drawings and on using 3D Studio MAX R2 to render the user model that you have imported from 3D AutoCAD drawings and how to animate you model.

The social impact:

The social impact of this project and its potential effectiveness of the use of 3D animation to assist with the problem of soliciting for large donations for construction projects.

At First, we learned how 3D animation has been used as a tool to help solicit funding. Found other companies/organizations that have done what we endeavor to do with this project. We wrote about the incentives that make corporations, foundations and individuals willing to give money to the WAM from a marketing aspect. Moreover, We described the reasons that make 3D animation make a difference from both aspects psychological and practicality. We discussed the use of 3D animation as marketing toll as well as an immerse tool. Finally, we argued the effectiveness of using 3D animation for this purpose and described how 3D animation ties into the critical elements of fundraising by explaining how and why 3D animation helps to improve the functionality of fundraising campaign.

We wrote about the history of fundraising at the WAM. We wrote about the proposed annex and discussed the necessity of the annex to the WAM, summarized the Museum's past fundraising drives and described the Museum's current fundraising practices and goals.

We interviewed those in charge of the fundraising at the WAM to see how they feel a 3D animation presentation will effect the Museum's ability to attract donators. We also sited results of surveys conducted by the WAM.

We conducted a questionnaire among WAM board members and any other WAM officials associated with the project to construct the Annex to the museum.

We explained the way to use our project as a tool to assist in the WAM fundraising practices.

We created rendered images that can be used in brochures and slide shows.

We recommended different ways to take advantage of our project for future purposes for the WAM or similar projects.

Finally, we wrote the project final write-up.

Equipment Used:

All of this equipment is currently available on the WPI campus, including a network of high-performance machines with 3D Studio MAX R2 installed on them.

- AutoCAD version 13.
- 3D Studio MAX R2.
- High-performance workstation or networked workstations for creating 3D renderings and animations.

Chapter 2:History of Fundraising at the Worcester Art Museum

An Introduction about Worcester Art Museum:

The Worcester Art Museum first opened its doors in the spring of 1898. The institution, founded by Stephen Salisbury III "for the benefit of all the people," today houses more than 30,000 works of art representing more than 50 centuries of creative spirit. The WAM is located on Salisbury Street in the city of Worcester, MA and has a total area of 149,152 square feet.

The WAM's internationally renowned collection bears tribute to the philanthropy and civic pride of the museum's benefactors, as well as the pioneering vision of its distinguished directors and curators. Thirty-five galleries offer visitors a walk through time and across cultures. The journey begins with sculpture and decorative arts from ancient Egypt, Rome and Greece including the largest and finest group of Antiochin mosaics in America, on display in the Renaissance Court. The Museum's twelfth-century Romanesque Chapter House - one of the first medieval structures transported to the New World - adjoins galleries featuring paintings, frescoes and liturgical objects from the European middle ages. The Asian collection, established with the 1901 bequest of John

[3] Restated from a Brochure about the WAM, 1997.

Chandler Bancroft's Japanese prints, now includes textiles, prints, ceramics, sculptures and paintings representing the major periods of Persian, Chinese, Indian and Japanese art.

Masterpieces of Italian, French, Spanish, Flemish, Dutch and British painting from the thirteenth through the twentieth centuries fill the European galleries. Highlights include important works by Piero de Cosimo, Andrea del Sarto, El Greco, Hals, Gainsborough, Goya, Turner, Renoir, Monet, Cezanne, Gauguin, Matisse, Braque and Kandinsky. Temporary exhibitions presenting drawings and prints from Durer to Warhol reflect the depth of the Museum's treasured works on paper. Goldwork, pottery, and sculpture represent the early history of art in the Western Hemisphere from Precolumbian America. Colonial and Federal silver, period furniture and decorative arts complement the American painting collection of oils and watercolors. Works by Copley, Stuart, West, Eakins, Bierstadt, Homer, Whistler, Cassatt, Hassam and Benson hang in five galleries. In 1898 the Museum opened the first New England gallery solely devoted to the permanent display of American portrait miniatures.

The Museum was among the first to exhibit and collect photographs as fine art. The photography collection has grown to over 2,000 images that span the entire history of the medium. Works from the Civil War to the present by Matthew Brady, Cartier-Bresson, Steiglitz, Weston, Frank and Winogrand are displayed in changing exhibitions. The twentieth-century galleries feature the great names in modern art - Sheeler, Benton, Avery, O'Keefe, Kline, Kelly and Noland.

Traveling exhibitions from museums and private collections throughout the world supplement the permanent collection. Temporary installations run the gamut from American folk art to African textiles; Old Master prints to Impressionist paintings.

Special tours, concerts, family days, lectures, workshops, classes, films and special events are organized throughout the year to accompany specific exhibitions and works of art in the collection. A complete day at the Worcester Art Museum will include visits to The Museum Shop and The Museum Cafe, which are both open during regular Museum hours.

Envisioning the Future:

With a view toward the future, the WAM took a long look at its facility. Some questions asked were, "What improvements would create a more welcoming and dynamic environment for visitors, befitting the museum's vision for a new century of service? What changes to the layout would make galleries easier to find and more accessible? How could orientation programs for visitors be better accommodated? And where would expanding collections be housed? What, above all, could the Museum do to truly make the facility a community crossroads where people routinely feast on art or lunch, drop in for a film, a workshop, or a special exhibition, visit with their families and out-of-town guests?" These are the long-range challenges that the WAM examined. Armed with a Facility Master Plan, the WAM is embarking on a major facility update.

The proposed addition must meet the expectations of twenty-first century visitors. A stunning new lobby, a new contemporary art gallery, new elevators, and a new shop and winter garden cafe are among the components of the Museum's proposed addition. The addition is going to be located on Lancaster Street. The goal in constructing the new addition is to change the main entrance of the Museum. It includes the main reception area, bigger gift shops, more restrooms, bigger coat racks, bigger cafe and restaurant areas and more study rooms. When the addition to the museum is constructed, visitors will be able to go to the gift shop without having to pay the admission fee. Currently, visitors can only go to the gift shop after paying the admission fee. The addition will be of further use for offering Art classes in the study rooms. Simply put, the purpose of the addition is to develop the visitors' services in the Worcester Art Museum.

Table 1: the area and cost of each component of the addition

Phase	**Area SQ FT**	**Cost per SQ FT**	**Costs**
Winter Garden			
Floor 1	3,500	$50	$175,000
Floor 2	6,000	$275	$1,650,000
Floor 3	3,500	$125	$450,000
Reception Area	4,000	$250	$1,000,000
Lancaster Lobby	12,000	$275	$3,300,000
Total	**29,000**	**Avg. $228**	**$6,600,000**

The Past Fundraising Practices:

Worcester Art Museum usually asks for funds as a Non-profit organization so they can get contributions and grants from their corporate donors and individuals. The WAM has annual fund drives and fund-raising events and usually they contact around 75% of their potential donors at these events. Moreover, they get funds from government agencies and associations.[4]

The Museum's fund raising committee usually sets up talks at the museum about the need for doing a project. Potential donors can be either individuals or foundations. Once they find the potential donors, they hold meetings with them and present to them the campaign brochures that might include drawings and a narrative description of the project. For foundations, research books are used to find foundations that might be willing to provide funding for the museum, keeping in mind the geographic giving restrictions and the range of potential gift sizes. Once these organizations are found, the WAM gets in touch with them by sending them letters and proposals and scheduling face-to-face visits.

The information was obtained through interviews and questionnaires of the WAM personnel.

The Struggle to Survive

The Worcester Art Museum has a history of struggling to get the money it needs to maintain the level of service it has provided. Throughout the years, the WAM used different methods to get as much money as it could. However, they still had to cut back on their spending. In this section, we will write briefly about the history of fundraising at the WAM. We will mention some major incidents where the museum had to change their objective so they can achieve all they can with their financial stands. Moreover, the WAM sometimes had to raise money to get back to financial stability.

Closing the school of the WAM:

In February 1987, the WAM announced that the school of the Worcester Art Museum would be no more. After 82 years of preparing students for careers in art, the school ran out of money, out of students and out of steam.

At the same time, the museum announced that the $17 million fund drive has ignited of support. The WAM had to raise the $17 million which was the absolute minimum needed to nurse the museum back to financial stability. There was no denying the institution was in trouble. The WAM had to sell all of its stock in the Worcester Telegram and Gazette In which was worth $11.5.

The free ride is over:

In September 1987, seven months after the WAM closed its school of Art the WAM reinstated its admission charge. The estimated charge was supposed to generate from $80,000 to $100,000 per year. This number is nothing to scoff at, but given the museum's $3.5 million annual budget at that time, the amount seemed like a modest sum to make up through a membership drive, additional grant money or some other traditional source of funding.

Capital success for the WAM:

By May 1991, nearly five years after launching the most ambitious capital campaign in the museum's history, the WAM officially brought the drive to a close after exceeding its goal of more than $17 million. At that time, that amount was more than any local art museums in New England has ever raised. That money was to virtually double the museum's unrestricted endowment.

In the same year, the WAM opened a new gift shop. The gift shop was a part of the museum's retail program. The objective of the latter was to provide a high quality merchandise that relates to the museum's collection, exhibitions and educational programs.

Cutting hours in cost-cutting Move:

In September 1995, The WAM announced that it would be curttailing the weekday hours it was open to the public soon after the WAM first break-even in recent memory. The museum also announced that it had laid off one full-time employee and three part-time employees.

"This is not a story of gloom and doom. Obviously, it's a belt-tightening measure" said James Welu, the WAM director. Those changes were made as an effort to save $100,000 of the museum's expedinture. The WAM was working for economic stability for its budget.[5]

[5] Worcester Telegram and Gazette, October, 14,1995.

- **The Current Fundraising Campaign:**

In December 1996, the Museum's management launched a comprehensive five-year Centennial Campaign to make endowment and facilities renovations for the museum. The current fundraising drive is the largest fundraising effort in the Museum's history. The Museum is well on its way to achieving its goal. The Museum is looking for $30 million. This amount will enable the WAM to advance into its next one hundred years stronger and more vibrant than ever. At the heart of the campaign is the critical need to increase the Museum's investment income. Therefore, half of the total campaign goal -$15 million- will go to strengthen the endowment, providing greater long-term financial stability and new revenues to fuel programs. New endowments will allow the WAM to firmly establish its commitment to contemporary art through expanded programs and a curatorial position in the field. The WAM will also be able to build upon successful initiatives, such as The Art of Discovery, and enhance its educational programs through wider use of technology. And the conservation staff will be expanded to ensure the care of the Museum's priceless collections. As a first step toward fulfilling the Museum's Facility Master Plan, the Campaign seeks to raise $7.5 million to cover such strategic projects as the restoration of Stephen Salisbury Hall, the creation of a contemporary art gallery, improved handicapped accessibility, as well as lighting, climate control and landscaping. The Campaign's second goal is to raise $7.5 million in annual gifts over the course of the campaign- will build upon the momentum of the Museum's

centennial through a series of community-wide activities such as arts festivals, special exhibitions and other public events.

So far, the Museum has collected over $16 million. Some of this money has been used to do renovations, establish funds, and to conduct major exhibitions and programs. On April 19,1998 the Museum launched the public campaign to complete the remaining objectives of the Centennial Campaign. Guided by the campaign steering committee, many individuals and corporate and foundation community partners will assist in bringing the Campaign to a successful conclusion by December 2001.

Chapter3: The Influence of Using 3D Animation to Improve the WAM's Ability to Raise Funds.

3D Animation:

3D animation is an enabling technology in computer graphics that integrates human users with computer-generated worlds. Regarded as the human-machine interface of the future, 3D animation addresses multiple human senses, such as the visual, the auditory and the haptic senses. 3D animation integrates tools and techniques for stereoscopic viewing, audio input/output and the processing of tactile information.

The range of applications and research subjects include medical topics, Tele robotics, design, man-machine-interface and scientific visualization.

During the past five years the technology required for virtual reality applications both in hardware and software has reached such a level that enables its use in industrial applications. The interest of companies in virtual reality, particularly in manufacturing industries, has strongly increased.

The development of high performance computing and communications is creating new media, such as the World Wide Web. In turn, these new media enable new types of

messages and experiences; for example, interpersonal interactions across network channels lead to the formation of virtual communities. The innovative use of 3D animations empowered by these emerging media, messages, and experiences make possible an evolution of using 3D animation in many aspects of life. In this project, we use 3D animation as a presentation method to create an image to the potential donors about the new addition so they can see how the building for which they are donating their money will look when completed. And hopefully by doing so the WAM will be able to attract more fund donors.

To the best of our knowledge, this project is the first of its kinds in the terms of using 3D animation for fundraising purposes. The technologies being discussed in this project are still swiftly evolving, case studies and formative evaluations are the predominant types of research available. Moreover, these limitations are intrinsic in any attempt to depict the future of a field.

The global marketplace and the communications and entertainment industries are driving the rapid evolution of high performance computing and communications. Regional, national, and global information infrastructures are developing that enhance our abilities to sense and act and learn. How information is created, delivered, and used in business, government and society is swiftly changing. So we must incorporate into the curriculum experiences with creating and utilizing new forms of expression, such as multimedia and 3D animations.

The "information superhighway" metaphor now widely used to convey the implications of high performance computing and communications is inadequate. Such an analogy is the equivalent of someone in 1896 declaring that the airplane will be the canal system of the 20th century. Backward looking metaphors focus on what we can automate—how we can use new channels to use conventional forms of content more efficiently—but miss the true innovation: redefining how we can use 3D animation by using new types of messages and experiences to be more effective. Since emerging forms of representation such as hypermedia and 3D animation are in their early stages of development, we are just beginning to understand how they shape not only their messages, but also their users.

Information infrastructures are the lever for this evolution, just as the steam engine was the driver for the industrial revolution. The emerging fields of multimedia/hypermedia, computer-supported collaborative learning, and experiential simulation are creating the tools that make these new forms of expression possible. Knowledge webs are built on multimedia/hypermedia architectures; virtual communities are based on capabilities from computer-supported cooperative learning; and synthetic environments extend experiential simulation into elaborate contexts for immersion.

Multimedia and hypermedia are learner-controlled interactive technologies; users can tailor presentations by selecting paths through the material customized to their interests. Also, these educational applications display data in multiple formats simultaneously (text, still images, animations, video, voices, sounds, music); this enables

people with various learning styles (visual, auditory, symbolic) to initially peruse material presented in their preferred mode of communication.

Different uses of 3D animations:

3D animations are being used in many different ways. Its been used for training, education, engineering, space, medicine and marketing purposes. In this section, we provide a few examples of the use of 3D animation in different environments. 3D simulations range from models that mirror the simplified essence of reality to elaborate synthetic environments with immersion interfaces that place students inside alternate virtual worlds. 3D Simulations can provide a learning experience for a single student or can involve multiple students interacting in a distributed virtual environment. Their content can reflect real phenomena made less complex to enhance understanding or can embody virtual universes that operate on different physical and social principles than our world.

3D animation as a tool for education purposes:

One example that illustrates the use of 3D simulation applied to learning business-based skills involves software engineering education; students are trained in code inspection which is a technical process that is one stage involved of a formal methodology for software development.[6]

Using hypermedia, Digital Video Interactive (DVI), and rule-based expert systems, the Advanced Learning Technologies Project at Carnegie Mellon University created a virtual environment similar to a typical corporate setting. The trainee interacts with this artificial reality in the role of a just-hired software engineer still learning the profession. Through direct instruction and simulated experience, the student practices the process of formal code inspection.

The learner can access various rooms in the virtual software company, including an auditorium, library, office, training center, and conference facility. Machine-based agents (knowbots) that simulate people, such as a trainer and a librarian, facilitate the use of resources to learn about the code inspection process. Via specialized tools in the office, the student can prepare for a simulated code inspection, in which he or she can choose to play any of three roles out of the four roles possible in this formal software review process. For each inspection, a rule-based expert system utilizes DVI technology to construct "knowbots" that simulate the three roles not chosen by the learner. This

[6] Fontana, Whites and Cates, Multimedia: Gateway to Higher-order Thinking Skills, 1993, Arlington,VA.

knowledge-based system controls the topic of conversation; determines who should speak next; and models the personalities of the knowbots in the inspection meeting, altering their cognitive and affective perspective depending on what is happening.

The learner uses a menu-based natural language interface to interact with these simulated beings, who model behaviors typical in code inspection situations. The student not only can choose from a wide range of options of what to say, but can determine when to make remarks and can select the emotional inflection of his or her utterances, from a calm passive tone to an aggressive snarl. By mimicking the reactions likely from human participants in a real simulation, the knowbots provide the learner with a sense of the strengths and weaknesses of different intellectual/psychosocial strategies for that role in a code inspection.

The educational effectiveness of this application was assessed both by the Southwest Research Institute and via a doctoral thesis at Carnegie Mellon University.[7] The results of these evaluations document that this simulation is both instructionally effective and highly motivating for participants. While this Code Inspection simulation is created for a single user, a similar design strategy could be used to create a distributed simulation in which multiple users separated by distance could cohabit a virtual environment along with machine-based entities.

While the application built by this project focused on code inspection as the skill to be trained, this project opens the door of a wide variety of work-related situations that

involve social interaction within a limited range of formalized behaviors through similar means preparation.

3D animation in the space science:

A second example of leading-edge work with experiential simulation is Science Space, an evolving suite of virtual worlds designed to aid students in mastering difficult science concepts.[8] 3D animation is analogous to diving rather than looking through an aquarium window; an immersion interface based on computerized clothing and a head-mounted display allows the participant to feel "inside" an artificial world. This type of immersion is what makes the 3D animation experience to make the user sense rather feel and interact with the virtual world.

Using this type of sensory immersion to present abstract, symbolic data in tangible form is a powerful means of attaining insights into real world phenomena. For example, "visualization" is an emerging type of rhetoric that enhances learning by using the human visual system to find patterns in large amounts of information. People have very powerful pattern recognition capabilities for images; much of our brain is "wetware" that is dedicated to this purpose. As a result, when tabular data of numerical variables such as temperature, pressure, and velocity are transfigured into graphical objects whose shifts in shape, texture, size, color, and motion convey the changing values of each

[7] Dede, the Evolution of Constructive Learning Environments, 1995, Educational Technology.

variable, increased insights are often attained. For example, graphical data visualizations that model thunderstorm-related phenomena (e.g., downbursts, airflows, cloud movements) are valuable in helping meteorologists and students understand the dynamics of these weather systems.

3D animation future uses:

In a few years, high performance computing and communications will make knowledge utilities, virtual communities, shared synthetic environments, and sensory immersion as routine a part of everyday existence as the telephone, television, radio, and newspaper are today. Keeping a balance between virtual interaction and direct interchange will be important. However, technology-mediated communication and experience supplement, but do not replace, immediate involvement in real settings. High performance computing and communications won't be a "silver bullet" that magically solves all problems of life. Even then, at times a sloppy, handwritten note delivered through surface mail will mean more to the recipient than an instantly transmitted, elegantly formatted electronic message. New media complement existing approaches to widen our repertoire of communication; properly designed, they need not eliminate choices or force us into high tech, low touch situations.

How a medium shapes its users, as well as its message, is a central issue in understanding the transformation in raising funds. The television and telephone creates

[8] Salzman, Dede, & Loftin, The Technologies Driving the National Information Infrastructure, 1995.

conversationalists; the book develops imaginers, who can conjure a rich mental image from sparse symbols on a printed page. Much of television programming induces passive observers. As we move beyond naive "superhighway" concepts to see the true potential impact of 3D animation, society will face powerful new interactive media capable of great good or ill. Today's "couch potatoes," vicariously living in the fantasy world of television, could become tomorrow's "couch funguses," immersed as protagonists in 3-D soap operas while the real world deteriorates. The most significant influence on the evolution of distance education will not be the technical development of more powerful devices, but the professional development of wise designers, educators, and learners.

Designers and evaluators of immersive 3D animation systems have many ideas concerning how 3D animation can facilitate different aspects of daily life. However, there is little information concerning which of 3D animation's features provide the most leverage about how to customize those features for different environments. In part, this reflects the truly complex nature of real life problems. Features of real life problem environment do not act in isolation; other factors such as the concepts or skills to be learned, individual characteristic, and the interaction experience all play a role in shaping the learning process and learning outcomes.

Through this project, we have been trying to identify, use, and evaluate immersive 3D animation's uses in different aspects. In doing so, we are beginning to understand the interplay between 3D animation's features and other important factors in shaping the image that we would like to create about a certain object. So, this project is an effort to

[9] Dede, Assessment of emerging educational technologies ,1994, national Technical Information Service.

use 3D animation in the aspect of creating an image about the museum's new addition to the potential donors. By doing so, we will create an image to the potential donors where their money is going to be. Further more how their money is going to be used.

Understanding how to use immersive 3D animation to support the learning of abstract concepts presents a substantial challenge for designers and evaluators of this emerging technology. In every aspect of our knowledge-based society, fluency in understanding complex information spaces is an increasingly crucial skill. In research and industry, many processes depend on people utilizing complicated representations of information. Increasingly, workers must navigate complex information spaces to locate needed data, find patterns in information for problem solving, and use sophisticated representations of information to communicate their ideas (Kohn, 1994; Studt, 1995). Further, to make informed decisions about public policy issues such as global warming and environmental contamination, citizens must comprehend the strengths and limits of scientific models based on multivariate interactions. In many academic areas, students' success now depends upon their ability to envision and manipulate abstract multidimensional information spaces (Gordin & Pea, 1995). Fields in which students struggle with mastering these types of representations include math, science, engineering, statistics, and finance.

Whether in industry, research, or academia, people trying to understand complex information need to be able to sift through complex information spaces, identifying what is important and what is not, as well as recognizing critical patterns and relationships.

They may need to translate among frames of reference, to imagine the dynamics of a model over time, and to reason qualitatively about physical processes (McDermott, 1991; White, 1993). They must be able to synthesize this information to build generic and clear mental models (e.g., Larkin, 1983; Redish, 1993), and these mental models need to incorporate invisible factors and abstractions.

Unfortunately, real-life metaphors upon which to build these mental models may not exist, making it difficult for people to envision abstract phenomena (Frederiksen & White, 1992; Reif & Larkin, 1991). For example, learning electrostatics or quantum mechanics involves understanding phenomena that behave in ways remote from direct experience. Additionally, people's real-life experiences are confounded with invisible factors that distort or contradict the principles they need to master.

Immerse 3D animation may support the type of learning environments people need. In fact, many researchers (e.g., Psotka, 1996; Winn, 1993) believe immersive virtual reality has potential as a learning environment. If properly designed, three-dimensional, multisensory virtual "worlds" might be able to aid users in comprehending abstract information spaces by enabling them to rely on their biologically innate ability to make sense of physical space and perceptual phenomena. And this is the key to virtual reality and 3D animation. From this point, this project is a trial to use 3D animation in the sense of 3D immersion to create the image that the WAM want to create to the potential donors.

Three-dimensional 3D immersion is a very potential use of 3D animation. Users develop the subjective impression that they are participating in a "world" comprehensive and realistic enough to induce the willing suspension of disbelief. Additionally, some research suggests that users are intrigued by interactions with well-designed immersive "worlds," inducing them to spend more time and concentration on a task (Bricken & Byrne, 1993). By engaging users in learning activities, immersion may make important concepts and relationships more salient and memorable, helping users to build more accurate mental models. According to these mental models, the users react and make an action.

In this project, we would like to create a mental model to the potential donors using 3D animation by creating animations of the museum with and without the new addition and to create a fly-through of the new addition. By doing so, the potential donors will have a mental model and according to their models they build their actions. In this case, their reaction is going to be donating to the WAM or not.

Why 3D animation Draws People In

"The golden road to corporational and foundational treasuries is littered with the bones of fundraisers who perished in their grant-seeking quests because, despite being armed with fundable projects, their written proposals were found wanting." [10]

An effective proposal is imperative. If some information in it seems sketchy or incomplete, the proposal will be stand poorly along side the proposals of other corporations. The fundraising market is competitive, and anything that give a particular corporation a *edge,* might be the deciding factor in who amongst the pile of potential philanthropic gift recipients on a fund donor desk gets that hard won cash. In the words of Jan Spitz, the Deputy Director of Development and External Relations at the WAM, it is necessary to "... get people excited, [and] make the project as real as possible; make the project 3D with words. Visual representations help so much more."

A grant-seeking request should be as humanized as possible. Instead of emphasizing lifeless objects such as buildings and equipment, emphasis should be placed on how people will benefit from a project. 3D animation assists in this regard, by allowing the prospective donor to see what a person will see when they walk into a new building, and a new extension to an old one.

Hillman, The Art of Winning Corporate Grants. 1980, Vanguard Press Inc, Pg.87.

Brevity and pointedness is also a key. The attention span of a potential donor should not be overestimated. When a fundraising director is meeting with a donor, the director should express as cleanly and clearly as possible where the donor's money will be going. To collect funds the construction of a building, this can be done no better than through the use of 3D animation.

A Psychological Perspective:

In the Large, the latest computer technology, which has been developed partly from video games, partly from cinema and partly from flight simulators, is "3D animation". It is based on the concepts of illusion and immersion. It creates the illusion of being immersed in an artificial world.

Years ago Morton Heilig (the inventor of Sensorama), after he had seen Cinerama and 3D, said: "When you watch TV or a movie in a theatre, you are sitting in one reality, and at the same time you are looking at another reality through an imaginary transparent wall. However when you enlarge that window enough you get a visceral sense of personal involvement. You feel the experience, and don't just see it."

Anyone who has been in an Imax big-screen theatre will relate to this. As Heilig put it: " felt as if I had stepped through that window and was riding the roller coaster myself instead of watching somebody else. I felt vertigo.

What has this got to do with advertising and fundraising? Sometimes studying the extremes of a phenomenon can provide insights into its milder forms that would not otherwise be intuitively obvious. Ads can mildly immerse us into an alternate reality rather than talking to us as a teacher speaks to students, or as a TV speaks to its viewers.

Immersion:

In the field of advertisement, commercials based on simulating reality can grab the audience's attention through striking visual presentation. The more entertaining and "real" an advertisement is, the more the viewers are invited to immerse themselves and experience the events from the vantagepoint of a participant or bystander in the advertisement.

Immersion and identification are a matter of degree. The difference between reading a story written in the first person and reading a story written in the third person is that the former is like listening to somebody tell you directly about their own personal experiences whereas the latter is like listening to somebody else's experiences. The action is more easily experienced in the first person because we project ourselves into the identity. The difference is in the degree to which we are reminded of our own identity or the external reality.

This is related to 3D animation. By decreasing the awareness of stimuli other than those coming from the cinema screen, TV, book, or computer video, we increase the "reality" of the mediated experience and the sense of it is as mediated. It is like the difference between listening to music on your stereo through headphones and through loudspeakers. With headphones one feels more immersed in the musical experience. The new technology of 3D animation is headphones for the eyes.

The more complete the experience of 3D animation becomes, the more we can let go temporarily of one reality and become immersed in another. This represents the ultimate in "switching off". So anything that lessens the salience of our own current "reality" and instead helps immerse us, the viewers, in the world of the ad makes the ad that much more powerful.

Using 3D Animation as a Marketing Tool

Marketing activities influence virtually all our lives in a very profound way. The public character of our society is shaped to some extent by our private behavior and the private behavior is influenced by marketing activities. This section talks about marketing, modern marketing strategy, consumer behavior, and promotions. And how we can use our understanding of such topics in creating 3D animation and apply it as a tool to raise funds for the WAM.

Marketing[11]

The term marketing evolved from the root word market. The term market is used essentially three different ways: a) a verb sense, b) a place sense and c) a people sense. The usage of the word market as a verb is undoubtedly one reason why many people interpret the term marketing as synonymous with selling. A second rather common use of the term market is a place or a sphere. . Although both are encountered, neither the verb sense nor the place sense of the word market are used extensively in the study of marketing. But the word market carries one other denotation. It can refer to groups of people.

At large, we will define marketing activities as those human activities which are directed toward the satisfaction of either a felt or a latent demand for goods and services.

There are three dimensions of the term marketing: economic, managerial and societal. Here is a brief introduction to each of them.

Marketing - its economic dimension

Economics is a field of study whose principal concern is the identification of the processes through which scarce means of production are ideally allocated among endless alternative uses. The economic process of allocating resources among alternative ends includes four basic types of human activities: A) extractive and agrarian activities. B) manufacturing, assembling and fabricating activities. C) distributive activities. And D) consumption activities. These four classes also represent marketing as closely associated with the distributive stages of this allocation process.

Marketing - its managerial dimension

Thus far we have observed that marketing activities are part of a general process of economic allocation. But there is another helpful way for us to view the activities of marketing. This view embodies the perspective of a businessman who shall assume is functioning as an important marketing executive in a corporate organizations. There are four important areas of decision making: 1- products and services. 2-value and prices. 3- promotion, and 4- distribution. So marketing can be thought of as the purposeful management of the products and services, the value and prices, the promotion and distribution activities of a business organization according to the preference of a market segment.

[11] Information in this part was the result of an extensive research about marketing. Look at the bibliography

Marketing - its societal dimension

Marketing also has important societal dimensions, marketing is unavoidably a social concern because marketing activities lead to the creation of new products and services, and because marketing activities promote new ideas to the society which is being served and because marketing activities involve an important persuasive role in the formation of public opinion. Marketing has pervasive and profound social dimensions because prices influence the purchasing power of the incomes we earn and because distribution influences buying convenience.

Modern Marketing Strategy

Marketing is not an insular or self-contained body of knowledge. Marketing is eclectic. Further more, marketing is an interdisciplinary study. Its interdisciplinary character stems from the fact that it utilizes concepts, principals and ideas from many other field of knowledge. More specifically, the discipline of marketing incorporates and uses ideas from such areas as economics, psychology, social psychology, sociology, anthropology, law, mathematics and many others.

However, the human activities that we refer to collectively as marketing, have never enjoyed great social prestige. With the exception of some relatively short periods

for a listing of the resources.

of time, marketing activities have historically been viewed as they say with alarm. The field of marketing has been thought of as made up of fast buck artists, con men, wheeler-dealers and shoddy-goods distributors. Indeed this alarm should be over by now and therefore marketing practices have gained a lot of momentum and marketing applications have grown rapidly in recent years.

Some marketing activities, such as advertising, overlook research and theory in the many aspects of communications and make most of its decisions on an intuitive basis. Marketing is partly an art. Therefore, marketing must always be creative and, to a large degree, intuitive. Freshness, imagination, novelty, drama, and daring are requisites and should never be shackled by stereotyped and rigid rules. Nevertheless, there are perfectly valid principles of successful communication that should serve as a framework for this creativity. Obviously it makes a tremendous difference to use relevant and effective motivational appeals.

In the field of communication, the success or failure of any message depends on so many other factors besides the rational content and the degree of attention the message receives. Yet that is virtually all that marketing is concerned with. A tremendous part of meaning is conveyed below the verbal level; yet marketing bothers to determine the impact of its nonrational symbols: art, color, tone, mod and so forth.

The effectiveness of any message is determined, in a large part, by the amount of attention it receives and whether the message uses meaningful motivational appeals.

Almost all marketing energy, especially advertising, has been devoted to measuring this factor of attention. A few of the larger agencies have instituted motivation research, but putting it to use is more difficult. Far and away the greatest part of advertising content judgements are still made without determining if the motivational appeals are truly applicable.

There is really no research in advertising comparable to that which the propaganda experts would undertake. Does the message create any empathy? Are the symbols and the abstractions significant to the class we want to influence? What emotionality is created, if any?

Consumer Behavior

The task of understanding consumer behavior is perhaps the most formidable of all the intellectual challenges in the study of marketing. Every human experience and some genetics traits can reasonably have a bearing on the actions of consumers. This fact alone suggests that the reasons underlying variations in consumer behavior are both numerous and complex. There is a definite relationship between consumers' purchase decisions and social and psychological changes. However, the task of isolating and identifying the interrelationships among the principal determinants of consumer behavior is still in progress. Our actions are determined not only by rational considerations but by underlying motivations, attitudes, feelings and group norms.

At present, the study of variations in consumer behavior is proceeding along four principal lines. These four approaches emphasize:

A) the economical aspects of consumer behavior

B) the social or sociological dimensions of consumer behavior

C) the psychological aspects of consumer behavior

D) the social-psychological dimensions of consumer behavior.

This project refers to the fields that are related to its context because each of these four fields of study can have very broad and general meaning. Further more, this project indicates explicitly what is included when referred to each one of them. The psychological aspects and the social -psychological dimensions of consumer behavior are related to our project.

Psychological aspects of consumer behavior

"Psychological aspects of consumer behavior" include those consumer actions that are influenced importantly either by the learning process or by the self-concept of each individual. Learning is a phenomenon that necessarily involves the psyche; and it is believed that some types of consumer behavior are learned processes. Therefore, this project deals with the interest in the psychological process of learning as it bears on consumer behavior. The relationship between mass communications, learning and

consumer behavior is apparent. In addition, a consumer may buy a product because, among other things, he feels that the product enhances his self-image. Similarly, a consumer may decide not to buy a product or not to shop at a particular store if he feels that these actions are not consistent with his own perception of himself. So the consumer is basically acting or reacting to what is called self-concept. Every purchase or action motivation has important psychological dimensions.

The social-psychological dimensions of consumer behavior

"The social-psychological dimensions of consumer behavior" include those consumer actions that are determined importantly by influential personages. Concern with the role of influential in the analysis of consumer behavior is essentially a concern with the interrelationships between persons in some group and particularly with the flow of influence from some persons to others.

Promotions

Promotion, including advertising, personal selling, publicity, user commendation and sales promotion, is an extremely important part of modern marketing. From a broad point of view promotion in one form or another accounts for the great majority of the total dollars spent for marketing. The efficiency of modern promotional methods is an issue of

significance to all industries. This project is concerned with the proof that the use of 3D animation, as a method of promotion, is going to improve the efficiency of promotion and advertisement in raising funds for the WAM. In this project, we examine some of the important modern techniques of promotion. This project also emphasizes on the influence of these techniques on the efficiency of promotional efforts.

More specifically, this project considers five issues that are subordinate to the efficiency of promotion. These issues are persuasion, promotion and the learning theory, symbolic communications in promotions, matching the message and the audience and measuring the effectiveness of promotions. The issues are as follows:

Persuasion

The use of principles of persuasion is a common denominator in all facets of promotion. Advertising, personal sales efforts and sales promotion all require persuasion. Persuasion involves a persuader, an issue to be presented and an audience. So promotion is the presentation of an issue to an audience in order to solidify or change the opinions of that audience. The persuasion techniques are improving everyday as the technology improves. Different methods of persuasion have been used and they change as the society change. Persuasion is the first step in promotion. The salesman has to convince the customer that the product is good rather a need for himself/herself. Depending on the degree of persuasion, the customer will take an action.

This project uses 3D animations in different ways to persuade the potential donors that the new addition to the WAM is a need for the museum rather a must. The 3D rendered images and fly-through in this project is an effort to express the benefit of having this addition to the WAM. Depending on this project degree of persuasion, the potential donors will take an action. This projects aims to make this action donating money for the new addition to the WAM.

Promotion and the learning theory:

The application of formal rules of learning theory in promotion is another aspect of promotion. Learning theory is the body of interrelated principles that deal with human behavior. Learning theory is the basic content of the field of educational psychology. The notion that learning theory may be relevant and helpful in the field of marketing suggests that the task of the teacher is not altogether different from that of the seller. That is both the educational context and the sales context have a disseminator of information, an audience and the fact that the disseminator can have a measurable impact on the audience. This close parallel between education and some forms of commercial communication suggests that the laws that govern learning in an educational context may also be useful when applied in a commercial circumstance.

Symbolic communications in promotions:

Through the use of symbolic communications in promotion substantial gains in promotion may be achieved. Communication is said to be symbolic when it is nonverbal and accomplished with a set of symbols. We communicate symbolically to a much greater extent than would at first be supposed. In fact, there are some contexts in which entire symbolic languages are used. On the other hand, our lives are influenced, and sometimes profoundly, by implicit communication symbols. We interpret and draw inferences about many aspects of our lives.

Our concern in this project is with the efficiency of symbolic forms of communications. Moreover, with the use of these means of communication in the development of commercial messages. By using different ways of presenting our 3D animations, this project aims to increase the efficiency of communication between the WAM people and the potential donors. Further more, to use these means of communication, which is 3D animation, for the purpose of raising funds for the new addition to the WAM.

Matching the message and the audience:

There tends to be imperfect target segmentation in mass communications. However, there exists both the means and the willingness to develop specialized forms of communication for different audiences and different messages. The general efficiency of

this project's commercial mass communications system must necessarily be enhanced because of such specialization.

The process of matching messages and audiences are identified, in general, by the elegant term "comprehensibility scoring devices". And these scoring devices represent the means through which promotion can be evaluated in terms its understandability. As far as this project is concerned, we will assume that the 3D animations in this project are understandable.

This process of matching promotion and a specific task reflects the level of efficiency of our mass communications system. So the WAM people have to know exactly the objectives that they want to achieve by using 3D animation as a method of mass communication. In chapter two of this project, the information on the current fundraising for the new addition to the WAM can be found.

There are five mental states that summarize the types of promotional efforts and tasks. First, precognitive is the mental state in which buyers or prospects are unaware of the class of products being presented. In this case, the promotional task is generally informative by creating an awareness of the product or the brand. Second, cognitive is the mental state where the consumer has product awareness. The task of promotion here is to develop a product preference by illustrating the pros of the product in a creative way. Third, affective is a mental state where the consumer thinks that the product is effective and useful. The task of promotion here is to alter attitudes and feelings rather than awareness. Promotion

will appeal with images. When affection exists, the task now is to move customer into the cognitive state. Fourth, the cognitive state is a mental state where the product becomes a positive goal of the buyer or prospect. Here, the customer feels a desire to acquire a particular product. The task of promotion here is to provide the motives to induce direct action and usually the purchase occurs here. Finally, a postpurchase mental state where the promotion efforts continue after a sale has been made to promote for the acquisition.

As far as this project is concerned, the project is not going to discuss the five mental states, nor how 3D animations will affect each one of them.

Measuring the effectiveness of promotion:

The integrity of promotional activities and how truthful the message is rests on how well those activities work. However, measuring the exact outcome of any promotion is a very hard task. The problem is the inability to establish in advance precise cause and effect relationships where a multitude of variables impinges upon a particular event. But to concede that it is virtually impossible to predict the effects of a promotional effort is not to say the user can not measure the effects of particular promotional efforts. The user needs to consider the nature of methods used to measure the effectiveness of promotional efforts.

There are three basic procedures that can be used depending on which method of presentation is being used:

A) Audience authentication procedure.

B) Laboratory tests of effectiveness.

C) Market tests of effectiveness.

Using 3D animation as a method of promotion for this project. This project aims to improve the market results after using such a method of presentation. Measuring the effectiveness of using 3D animation is best done with the market result after using the new method of presentation compared to the previous results. Market tests of promotional effectiveness require

A) Exposure of a promotional effort to a market or a part of a market which is the WAM audience in our project. So, the final presentation of this project to the WAM audience will expose them to the use of 3D animation for fundraising purposes.

B) Some systematic means of tracing the impact of that promotional effort upon sales volume or upon awareness or attitudes. In this project, there is a section about the WAM audience reaction after the final presentation.

Using 3D Animation as an Immerse Tool

In this section, the reader will be introduced to a new idea of using 3D animations as an immerse tool. The use of 3D animations as a tool to improve people's perception of any idea, topic or object is a new field which is called Psychographics.

Psychographics

Psychographics is a science which can be used to help the user anticipate the specific positive, negative or neutral psychological impact of words, symbols, shapes, textures, colors, fonts or even scale on both specific and general consumer target market groups. These insights can offer a significant creative advantage in the development of impacting corporate identities, promotional tools and advertising campaigns.

'Psychographic profiling' categorizes people into unique 'typologies' ('profiles') based upon their values and lifestyles. The more standard age/gender/income demographic definitions collectively play a minor role the psychographics formulae.

The science originated in the United States with the work of the late Arnold Mitchell of Stanford Research Institute's Business Intelligence Program. Instead of favoring any specific school of sociological thought (Maslow, Fromm, etc.), Mitchell's

work embraced as many of them as possible: appreciating and combining what each offered. What resulted is an approach which can allow for precise and significant impact to be achieved whether the target market includes dozens of different consumer groups or whether the target is a specific industry or individual.

Psychographics can be used to fine-tune the impact of existing communications materials or tools (i.e.: corporate logos, advertisements, speeches) and to create very effective specific goal-oriented materials. Significant applications are related to the creation of a new entity/identity or to the introduction of a new product or service. Where the latest marketing sciences at the concept level are used long before the product goes to the market. Psychographics is a tool which is accurately designed FOR a specific target. Using 3D animations enables the user to direct the science of psychographics in any direction and for different purposes.

In this project, the use of 3D animation allows the WAM people to control the image that will be created for the potential donors when they look at the 3D animations to a large degree. By doing so, the perception of the potential donors about the new addition is being created by using 3D animations and somehow being controlled. Moreover, If this project succeeds in the term of creating the desired image for the potential donor, they will donate a larger amount of money to build the new addition to the WAM.

The science of psychographics is a new science that needs to be proven. And this project is an effort to prove that psychgraphics work efficiently for the fundraising purposes at the WAM.

As an example of using psychographics:

To Their Health

Rx companies are trying to figure out the best method for reaching aging boomers. A muscular blonde windsurfed skims the tops of golden wheat fields, a woman with pink and perfect toenails plays foots with her boyfriend and coyly suggests that he too take off his shoes, and a grandfatherly figure helps a small child learn to ride a bike. All are images used by pharmaceutical manufacturers to sell their drugs in recent direct-to-consumer (DTC) advertising. From control to personal fulfillment, from freedom to fear, many pharmaceutical manufacturers are playing on emotions to motivate consumers to ask their doctors about their drugs.

DTC campaigns, which include an extensive use of direct mail and Internet marketing, are booming, increasing from just $25 million spent in 1988 to an estimated $1 billion plus in 1998. Unaccustomed to such heady levels of spending, concerned pharmaceutical executives are trying to figure out the return-on-investment on their expanding DTC expenditures and determine how these millions can best be spent. As they sort through the data, the psychographic profiles of those 40-and-older, it appears, is as worth considering for other categories, like financial services and even automobiles, as it is medical care and prescription drugs.

Many forces impact on the writing of a prescription, including the physician's style of practice, the patient's health insurance coverage and his or her perception of the need for medication. Regardless of the influences, the starting point remains: who is the potential consumer or patient? Because those 40-and-older clearly account for $8.40 out of every ten dollars of all prescription drugs sold in the United States, they are the overwhelming target for DTC advertising. The lifetime value of a patient suffering from a chronic disease or condition such as adult-onset diabetes or osteoporosis is immense.

Attitudes Drive Health Choices

But not all diabetics seek control, nor will a purely rational appeal motivate someone with prostate problems to take an advertisement to his doctor. In the long process of making and keeping a pharmaceutical sale, intuition and logic aren't reliable in determining what will motivate consumers. A product positioning may succeed with one segment, but turn off others. And the marketer's own logic is not necessarily shared by consumers who may not even see or appreciate the benefits of a drug.

DTC marketers also have to recognize that consumers with a specific illness or condition don't share the same motivations. There is no "average" diabetic or "average" person with high cholesterol or "average" post-menopausal woman.

Markets are always made up of two or more segments with very different motivations. When these are averaged, the resulting positions don't mirror anyone's

concerns. DTC efforts have had a better chance of succeeding if they're based on a quantification of what consumers perceive to be important about their health. Attitudes toward health and wellness, health information sources, and compliance are also tough to change. Not only have they been shaped through years of living, they're often at the very heart of a person's perceptions of life itself. It's far easier for DTC advertisers to target receptive consumers in the information sources or media they prefer. This approach includes creating relevant messages targeted at a specific psychographic segment.

Based on ongoing surveys of the mature market going back to 1989, combined with experience in creating psychographic segmentation strategies, the database we use includes over 15,000 respondents, 50 million pieces of data, and nine separate segmentation strategies. DTC 1997 study includes 3,000 randomly selected U.S. consumers 40-and-older and is the source for the findings presented here.

The three separate health-related segmentation strategies, discovered by quantitatively assessing a unique set of core values and innermost needs about specific aspects of health and wellness, include:

Health segments—what does or does not motivate someone to actively take care of their health?

Health information segments—what motivates someone to seek and use health-related information?

Health compliance segments—what motivates someone to comply with their doctor's instructions and drug regimens?

The health psychographic segmentation includes Proactives, Faithful Patients, Optimists, and Disillusioned.

Psychographic Health Segments

1) Proactives:

- health has become a greater concern
- committed to exercise and believe they are physically fit
- very careful to eat a balanced, low-fat diet
- believe in getting an annual physical
- actively seeks out of information on how to stay in good health

2) Faithful Patients:

- aware that they should eat well and exercise
- do little to take care of their health
- rely on doctors and medications.
- continually try new over-the-counter drugs

look to religion in times of poor health

3) Optimists:

- say they almost never get sick
- optimistic about staying in good health
- don't believe in having a yearly physical
- will take medicine only when absolutely necessary

believe they get enough exercise

4) Disillusioned:

- least trusting of doctors, lack faith in medical system
- careful to eat balanced diet
- take medications only when necessary
- feel their health insurance is inadequate
- convinced the U.S. needs guaranteed healthcare

Of the four health segments, Proactives and Faithful Patients dominate pharmaceutical sales to those 40-and-older. Proactives account for 38% of pharmaceutical sales, while Faithful Patients represent 32%. As DTC have noted in the chart, there are massive differences between the Proactives and Faithful Patients in their motivation to take care of themselves, their use of health information, and their receptivity to media.

These stark differences show that it isn't sufficient to target "heavy users," a category that is made up of more than one psychographic segment.

A Marketing and Sales Mesh is Key

The fact that the important Faithful Patients are only slightly receptive or swayed by health-related messages in advertising or mass media makes it imperative that DTC mesh with sales efforts. Faithful Patients are very open to health messages delivered by their doctors. A "pull" strategy is effective with Proactives, heavy consumers of health-oriented media. Achieving the necessary synergy between marketing and sales efforts is

easier if a segmentation based on health attitudes in general is used, rather than several segmentations, one on every specific disease. DTC advertising is the first step, creating awareness and laying the groundwork for trial. But to achieve its highest return, DTC should reinforce the actions of the patient's physician; friends and family; the pharmacist, and provide a support program, whether sponsored by a pharmaceutical company, drug store chain, or HMO. And all of these efforts have to be unified by the same understanding of the patient's motivations toward health.

Select Media and Message by Psychographic Segment

Select Media and Message By Psychographic Segment While recent FDA changes have loosened restrictions on pharmaceutical advertising on television, decisions about where to advertise should flow from knowledge of what media each segment prefers. Since mass advertising conveys the 800-number or Internet address to the consumer that begins the direct cycle, it's important to select media reaching the greatest number of consumers with the disease or condition who are receptive. For example, DTC advertising in Prevention reaches more Disillusioned and Proactives than those in the other health segments. While they are open to information about health, it's important for DTC marketers to note that far more Disillusioned than average are either too poor to pay for a prescription or have no health insurance coverage.

In considering whether to place a DTC advertisement in Business Week or Kiplinger's Personal Finance, DTC knows that Business Week reaches fewer Proactives

(34% versus 43%) and more Optimists (22% versus 16%) than Kiplinger's. Though they are an upscale segment, Optimists largely ignore symptoms, avoid taking pharmaceutical drugs and run away from doctors.

Triggering a Contact

Overall, 8% of those 40-and-older have called an 800-number to receive information about a pharmaceutical or prescription drug or treatment in the past 12 months. The percentage calling such a number is virtually the same for older boomers in their 40s and elders 65 and older. But there are significant differences by health segment. Few Optimists make such calls, and Disillusioned are only average. The majority of callers to 800-numbers are Proactives and Faithful Patients. Knowing that someone calling an 800-number is either a Proactive or Faithful Patient should lead a pharmaceutical company to respond based on each segment's motivations. To achieve the highest ROI on a DTC campaign, the messages embedded in the materials sent, the frequency and type of contacts and the design of relationship-building programs should differ significantly by health segment.

Internet Holds Promise

Among those 40-and-older, only 4% have used the Internet in the past 12 months to secure advice or information about health. Among those 40 to 49 the percentage is 6%. Far more Proactives (10%) in this age group are making use of the Internet in this way than are Optimists (2%). To attract Proactives to their sites and keep

them coming back, DTC marketers have to provide this segment with substantive and reliable information.

Recognize Regional Differences

Prioritizing DTC media expenditures on a market-by-market basis increases the likelihood that marketing dollars will be spent most effectively. Regions of the US differ by the incidence of disease. Since the 1960s, for example, scientists have known about the "Stroke Belt" that snakes its way through much of the South and Southeastern United States. Regions also differ by HMO penetration; styles of practice by physicians, sales force strength and level of activity, and the percentage of the population that's insured. While all these factors must be considered, a psychographic analysis of consumers in each market shows that two of the four health segments, Proactives and Faithful Patients, skew to different states. Greater percentages of Proactives than average can be found in such states as Oregon and Maine. Faithful Patients are disproportionately located in Alabama, Kentucky, and Tennessee. These insights can be tied to both push and pull strategies. In a market dominated by Faithful Patients, it would be best to use a push strategy through physicians. Where Proactives dominate, media can be selected by their preferences.

Optimizing Media Selection

Using Strategic Direction's 40+sm database and Simulator® software, is tied together our psychographic health segments with behaviors, demographics, disease categories and media usage to lay out the most targeted and cost-effective media plans. If Simulator is set up to reach Faithful Patients with diabetes, for example, TV Guide comes up as one in a group of selections that provides the greatest efficiency: the highest reach at the lowest cost. With psychographic segments as an integral part of Simulator's optimized media schedule, DTC advertisers can craft messages that will motivate the most profitable health segments.

Crafting Targeted Messages

A message relevant to Faithful Patients would stress listening to their doctors' advice. The idea that they can actually do something about their condition may get the attention of those Faithful Patients who are also Uninvolved Fatalists, a health information segment. Proactives, especially those who are also Internal Health Actives, another health information segment, would be receptive to the concept of taking medication as a way of caring for themselves.

Predicting Trends with Psychographics

It's true the aging of the U.S. population will fuel the sales of pharmaceutical companies, but those increasing market share will use DTC effectively. They will design

DTC programs to target specific psychographic segments of this aging population. As we have seen, not all-psychographic segments in the 40-and-older population are receptive to DTC. And 70% of pharmaceutical sales to those 40-and-older are made to two very different mindsets: Proactives and Faithful Patients. Basing DTC strategies on consumers' motivations will ensure that pharmaceutical brands are integrated, targeted, and refined.

Conclusion

3D animation is an enabling technology in computer graphics that integrates human users with computer-generated worlds. Regarded as the human-machine interface of the future, 3D animation addresses multiple human senses, such as the visual, the auditory and the haptic senses. The innovative use of 3D animations empowered by new-emerging media, messages, and experiences make possible an evolution of using 3D animation in many aspects of life. In this project, we use 3D animation as a presentation method to create an image to the potential donors about the new addition so they can see how their money is going to be used. And hopefully by doing so the WAM will be able to attract more fund donors.

Whether the fund provider is a business owner, government agency, foundation or a philanthropist, these donors need to be convinced that their money, perhaps hundreds of thousands or even millions of dollars, are all going to be put to good use. Therefore, we would like to create a mental model to the potential donors using 3D animation by creating animations of the museum with and without the new addition and to create a fly-through of the new addition. By doing so, the potential donors will have a mental model and according to their models they build their actions. In this case, their reaction is going to be donating to the WAM or not.

An effective proposal is imperative. The fundraising market is competitive, and anything that give a particular corporation an *edge,* might be the deciding factor in who

amongst the pile of potential philanthropic gift recipients on a fund donor desk gets that hard won cash. A grant-seeking request should be as humanized as possible. Emphasis should be placed on how people will benefit from a project. 3D animation assists in this regard, by allowing the prospective donor to see what a person will see when they walk into a new building, and a new extension to an old one. Moreover 3D animation is the best way to achieve brevity and pointedness.

Some marketing activities, such as advertising, overlook research and theory in the many aspects of communications and make most of its decisions on an intuitive basis. Marketing is partly an art. Therefore, marketing must always be creative and, to a large degree, intuitive. Freshness, imagination, novelty, drama, and daring are requisites and should never be shackled by stereotyped and rigid rules. Nevertheless, there are perfectly valid principles of successful communication that should serve as a framework for this creativity. Obviously it makes a tremendous difference to use relevant and effective motivational appeals.

This project uses 3D animations in different ways to persuade the potential donors that the new addition to the WAM is a need for the museum rather a must. The 3D rendered images and fly-through in this project is an effort to express the benefit of having this addition to the WAM. Depending on this project degree of persuasion, the potential donors will take an action. This projects aims to make this action donating money for the new addition to the WAM.

"Psychological aspects of consumer behavior" include those consumer actions that are influenced importantly either by the learning process or by the self-concept of each individual. Learning is a phenomenon that necessarily involves the psyche; and it is believed that some types of consumer behavior are learned processes. Therefore, this project deals with the interest in the psychological process of learning as it bears on consumer behavior. The relationship between mass communications, learning and consumer behavior is apparent. In addition, a consumer may buy a product because, among other things, he feels that the product enhances his self-image. Similarly, a consumer may decide not to buy a product or not to shop at a particular store if he feels that these actions are not consistent with his own perception of himself. So the consumer is basically acting or reacting to what is called self-concept. Every purchase or action motivation has important psychological dimensions.

By using 3D animation, this project utilizes an emerging communication science to create a more effective image for the WAM audience, or enhance the impact of the WAM current marketing program and marketing materials. This project is an effort to improve the marketing techniques of the WAM.

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Appendix A: AutoCAD Tutorial

Why did we use AutoCAD?

Computer technology and programming has always been a great tool in science, it has always provided science with many useful programs that fill up when the necessity calls. One of the great programs, that computer technology delivered for us is Auto Cad. Auto Cad is a general-purpose computer aided drafting application program designed for use on single-user, desktop personal computers and graphic workstations. Autodesk Inc., Sausalito, California, initially developed it in the early 1980's. Autodesk Australia, now located in Sydney currently distributes it in Australia. Auto Cad has provided architects with a lot of help either by saving their time or intention while drawing or by exposing them to a new era where there are no limitations for the drawing. Not only did Auto Cad provide engineers with their job requirements but it also saved our environment by reducing the usage of paper made out of trees. Auto Cad is extremely generous. It caused a new revolution in the field of Architectural Engineering. The impact of auto cad did not only touch the architectural engineering area. However, it expanded to the reach all of those whom would like to learn about it and its application.

The following concepts and techniques are very handy while learning Auto Cad R13. The following few pages are about the following:

- Concepts and definition in Auto Cad R13

- *What's in an AutoCAD drawing.*
- *Units, scales and paper sizes.*
- *3D graphics concepts.*
- *Interacting with AutoCAD*
- *A walk though tutorial about the WAM drawing*

Concepts and definitions

AutoCAD is an interactive drawing system that allows a user to construct or edit a drawing on a graphics display screen. To this extent, it is analogous to a word processing program, except that in this case the object being processed is a drawing. Each drawing is stored on a disk file, and AutoCAD is only able to edit one drawing (or file) at a time. This similarity to word processors is reflected in the fact that the principal functional component of AutoCAD is known as the drawing editor.

Up until Release 10, AutoCAD was essentially a two-dimensional drawing system. Following that release, it now supports a full three-dimensional database. This has had the effect that the features of AutoCAD that support two-dimensional drawing are fully self-contained and can still be used as a 2D system without being concerned with its 3D features. In this discretion I will focus on the 2D drafting aspects of AutoCAD since that better reflects the way in which this system is generally used in practice at the present time. In order to understand AutoCAD, the user must focus on a few specific concepts. Most users deal with the drawing with out understanding what a drawing is therefore I decided to write about the auto cad drawing.

What's in an AutoCAD drawing.

An AutoCAD drawing is made up of entities. These can be either simple graphic primitives *(such as lines, arcs, circles, text, and so on)* or blocks (which are groups of entities). The graphic primitives are defined geometrically in terms of the normal Cartesian coordinate system (right-handed system with positive X-axis to the right, positive Y-axis up the screen and positive Z-axis coming out of the screen towards the user). Hence, for example, they're end- point coordinates (x, y and z) define lines, while their center coordinates and radius define circles. Each entity also has certain attributes associated with it, such as line style, text font or color.

Blocks:

A block is a group of entities that can be manipulated as a single unit. Once created, a block may be moved, scaled, rotated, copied or deleted. A block can be created by collecting together a group of entities from the current drawing (the drawing being currently edited) and assigning a single name to that group. Alternatively, an existing drawing (from disk) can be inserted into the current drawing as a block. Equally, a block from the current drawing can be written out to a file as a new drawing. It is important to understand that a block, in AutoCAD, is unique to a specific drawing. That is, when an existing drawing is inserted into the current drawing as a block, AutoCAD simply copies the graphics from that drawing and includes it as a single object. The existing drawing is unaffected by the action. Indeed, if that existing drawing (from which the block was created) were subsequently edited then those changes would not affect the inserted block.

It is possible, however, to update a block definition in a drawing by having AutoCAD redefine the block using the current version of the original drawing. As an alternative to inserting a drawing into another drawing as a block, AutoCAD now provides the facility to attach a drawing to the current drawing as an external reference. The external drawing is then treated like a block except that it is automatically updated each time the drawing to which it is attached is loaded. Naturally, if the external drawing is altered in the meantime, then the external reference will be updated to reflect those changes. Another important feature of a block (including external reference blocks) is that it can be duplicated many times within a drawing, with each copy pointing to the one graphic description, but having its own unique position, scale and rotation factor. This is known as instancing. There are two advantages to this approach: space saving - the graphics description is only stored once; and ease of re-definition - the graphics description of a block can be altered and then re-defined in order to update each instance in the drawing. The final concept to be explained about blocks is the notion of exploding. Any instance of a block may be exploded in order to reduce it back to its separate graphic entities. Similarly, an external reference block can be unbound so that it becomes a local block and then, in turn, can be exploded.

Units, scales and paper sizes.

A clear understanding of the way that AutoCAD handles units of measurement, scale and paper size is necessary before a drawing can be created or edited. AutoCAD provides complete control over these factors by distinguishing between model space and

paper space. All drawings, whether two-dimensional or three-dimensional should be thought of as models of a real-world entity (either a drawing or a 3D description of a real-world object). In either case, the description is maintained in model space. Paper space can be model of a standard-size piece of paper on which the user can establish *viewpoints* (rectangular regions) in which AutoCAD will display scaled views of the drawing the user have created in model space. The user can, of course, add additional *linework* in paper space to form borders and annotation. In order to understand this, it is best to picture model space as a very large piece of paper located somewhere in two-dimensional space. (AutoCAD can actually draw anywhere in 3D space, but let's ignore that for the moment!) Since, the size and location of that piece of paper is entirely up to the user, it would make sense to choose something that makes drawing as simple as possible. This means that when drawing a plan of a building that is, say, 15 meters square, the "paper" size (in model space) would be set at something greater than 15,000 x 15,000 units (where "units" equals millimeters). Strictly speaking, it is not necessary to set the model space drawing size, but it is helpful to do so in order to establish a context for the drawing. When working on the drawing in model space, the user should think of the graphics screen as a window through which the user can view all or part of that drawing sheet. Thus, when viewing a drawing, a larger display scale will allow the user to view only a part of the drawing on the screen. This is referred to as zooming in on the drawing: as the user increase the scale, he or she can see less of the drawing, but what the user can see will be in greater detail. If the user zoom out, then he or she will be able to see more of the drawing, but in lesser detail. AutoCAD provides some fairly sophisticated tools for zooming in and out of the users drawing and for panning back and forth across it.

Although it is possible to plot from model space, it is normal to set up a sheet in paper space, and create one or more *viewpoints* showing different views of the drawing in model space. Each view is displayed at a fixed scale, and the paper space drawing is then plotted at a scale of 1:1. AutoCAD also supports the standard notion of layering (refer to the general notes on CAD). This means that any drawing entity can be assigned to any layer of the drawing. This allows separation of portions of the drawing. For example, all brickwork could be assigned to one layer, all electrical work to another, and so on. In that way, when plotting, only selected layers need be included in the physical drawing that is produced from the one AutoCAD drawing.

Layers:

Layering can also be used to advantage while editing a drawing. For example, suppose a plan drawing is substantially complete with only the brickwork cross-hatching to go. If all the brickwork is on one layer, each other layer could be turned off so that only the brickwork is visible and selectable. That makes it possible to Crosshatch the brickwork without inadvertently affecting something else. Layering in AutoCAD is manipulated with the properties that can be assigned to each layer. Once the interaction between layer properties is understood, then these can be manipulated to great advantage.

3D graphics concepts:

All graphic entities in AutoCAD are defined fully within 3D space. However, in the normal case, where the user makes no attempt to define them as 3D objects, they are assumed to lie on the base (Z=0) plane of the world coordinate system (WCS) defined by AutoCAD. In that case, the z- value of every point is assumed to be zero and the user has no need to be concerned about it. In order to support the 3D user, AutoCAD provides many basic ways to enter 3D information:

- Most of the basic graphic entities (*lines, arcs and curves*) can have a thickness associated with them, which is effectively a height in the z-direction.

- When specifying the position of any point during the drawing process, the user can enter all three coordinate values. (Again if only two coordinates are specified, the point is assumed to lie in the base plane - note also that some entities must be perfectly planar, so if you attempt to enter a 3D point that would make such an object non-planar, then AutoCAD will display an error message.).

- AutoCAD supports a number of specifically 3D graphic entities, including 3D *poly-lines*, faces and meshes, along with a set of commands that can be used to create 3D objects with them.

- Most significantly, AutoCAD allows the draftsman to set up a temporary user coordinate system (UCS) which can be positioned and orientated anywhere in space

(relative to the WCS.) - Thus the user can picture the standard X, Y and Z axes of the WCS and then imagine an equivalent set of axes (the UCS) being moved away from the origin and then tilted and rotated to any orientation that the user wishes - once a UCS is established. All 2D drawing is done relative to those coordinates until a new UCS is defined or the user switches back to the WCS. From release 11 onwards,

• AutoCAD has provided an extension package called AME (Advanced Modeling Extension) which provides 3D solid modeling capabilities. These solids allow the user to form complex solid objects by adding, subtracting and intersecting a set of simple solid primitives (such as, boxes, cone, cylinders, spheres, etc) - for example, The user can form a box with a circular hole by subtracting a cylinder from a box, and so on. Notice that the 3D characteristics of AutoCAD merge fairly neatly with the traditional 2D facilities such that it is possible (and not uncommon) to use AutoCAD as if it had no 3D facilities at all. That now concludes the discussion of general concepts in AutoCAD.

Interacting with AutoCAD:

When the user run AutoCAD, he or she are immediately switched to what has become known as the Drawing Editor. If AutoCAD is running inside a windowing system, then it may occupy the whole screen and will include a window bar across the top of the window. On a DOS-based PC, AutoCAD occupies also the whole screen. The

major portion of the AutoCAD window is assigned to the drawing area. It will display the same portion of the drawing as was visible the last time the present drawing was edited. Starting a new drawing then, naturally, the drawing area will be clear. Above the drawing area is the status area where various items of status information are displayed (such as the current layer, current color, coordinates of the last point entered, etc.). On a DOS-based PC, whenever the graphics cursor is moved into the status area, the status information is temporarily replaced by a row of pull-down menu names.

- **AutoCAD Tutorial**

After going through all this informational concepts in great depth the user should have a brief background about the use of Auto Cad and the application of it. However the best way to understand the theory is apply it in a tutorial. The following section will provide the user with a step by step tutorial. In order to have the best results.

Step one:

Start AutoCAD by clicking on Start (in the bottom left corner of the screen), then move the mouse to Programs then CAD Applications then AutoCADR13. AutoCAD will take a few moments to load, so be patient. Once AutoCAD has loaded, move the mouse around until you see a cross cursor. The AutoCAD window has a number of important features:

1. The standard windows drop down menus.

2. The standard windows toolbar below the menus, it included File- New, File-Open, File-Save, Print and Spell Check (!).

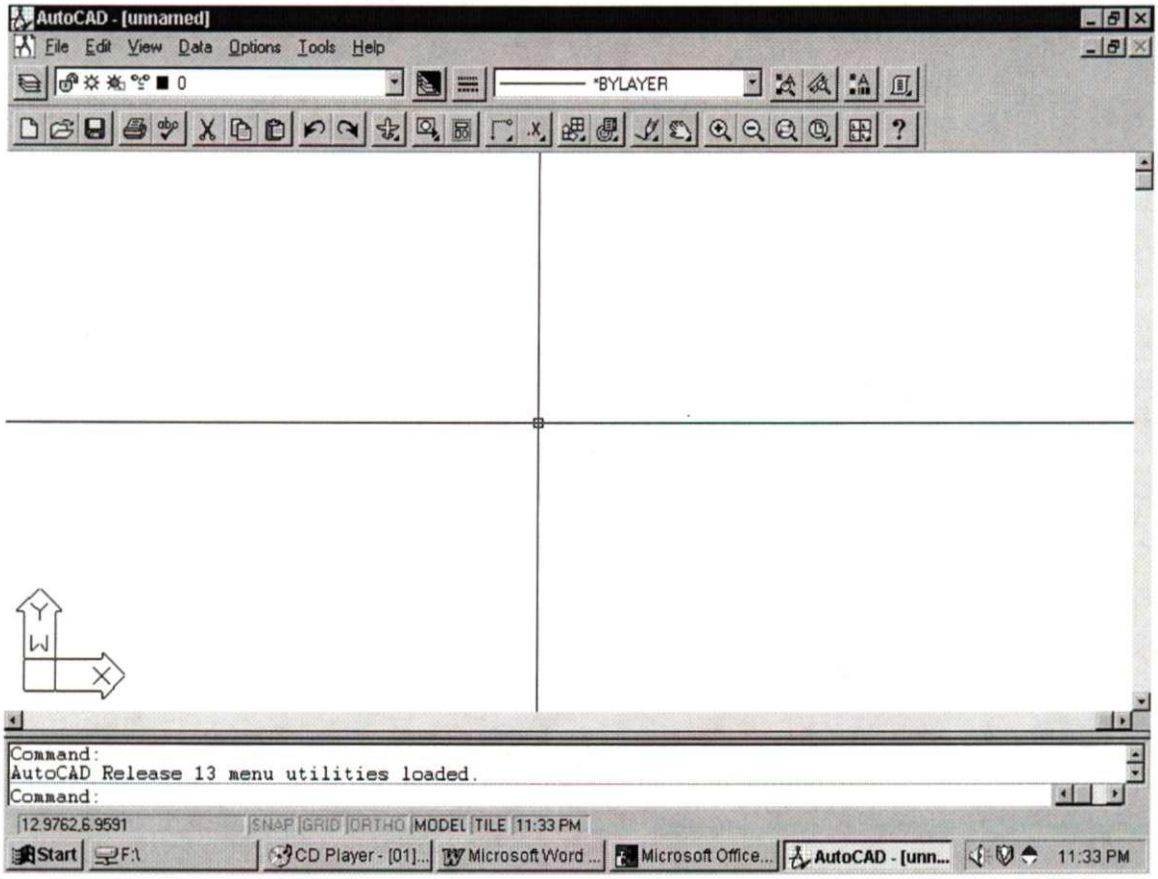
3.1n addition to the standard toolbar there are a three AutoCAD specific toolbars: Object Properties, Draw and Modify.

4. The graphics area - that's the area where you draw - notes the scroll bars and the axis label.

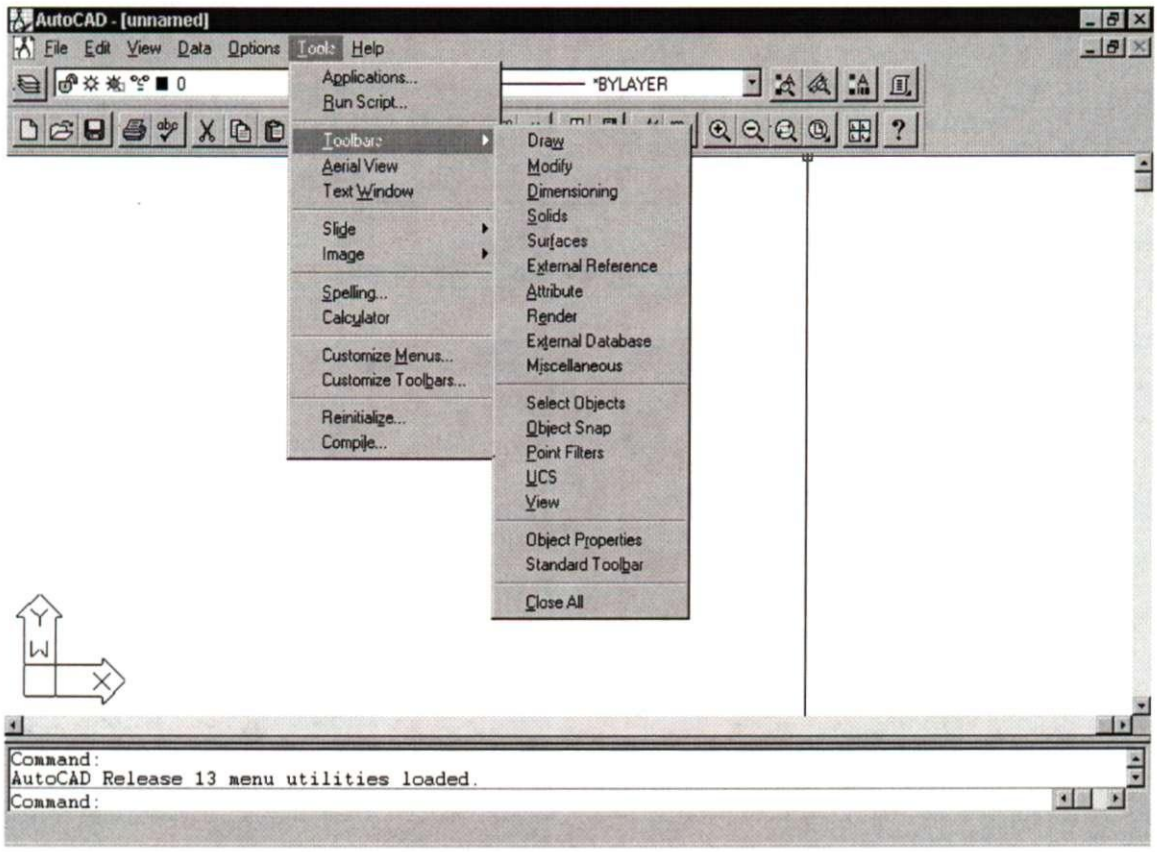
5. The command area - this small window (by default) has space for three lines of text - this is where you type commands.

6.The status area, at the bottom of the AutoCAD window, this includes the current cursor position, and the time!

The picture below refers to Step one:

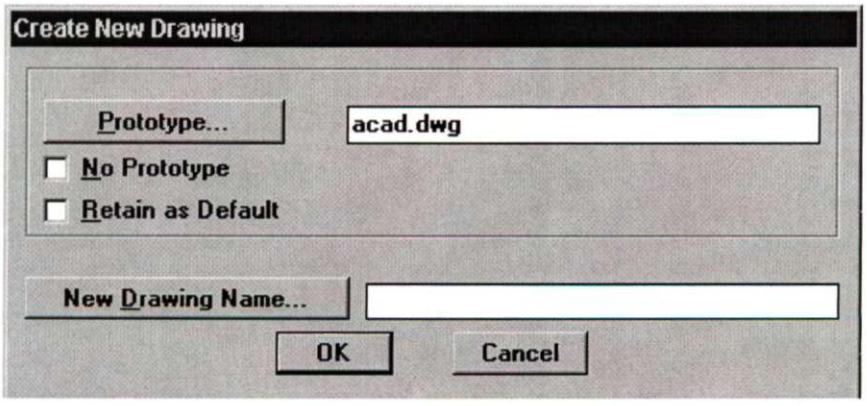


Note: when the user opens windows it is not necessary that all the tool bars will appear. Sometimes these tools or Data do not appear until the user recalls them either by going to tools (on the top of screen). Then a box will come up and give the user many selections of tool bars such as the *drawing bar, dimensions bar or the solids bar etc.* it is important to understand the function of every bar in order to have a *fruitful* results of the bars selected.

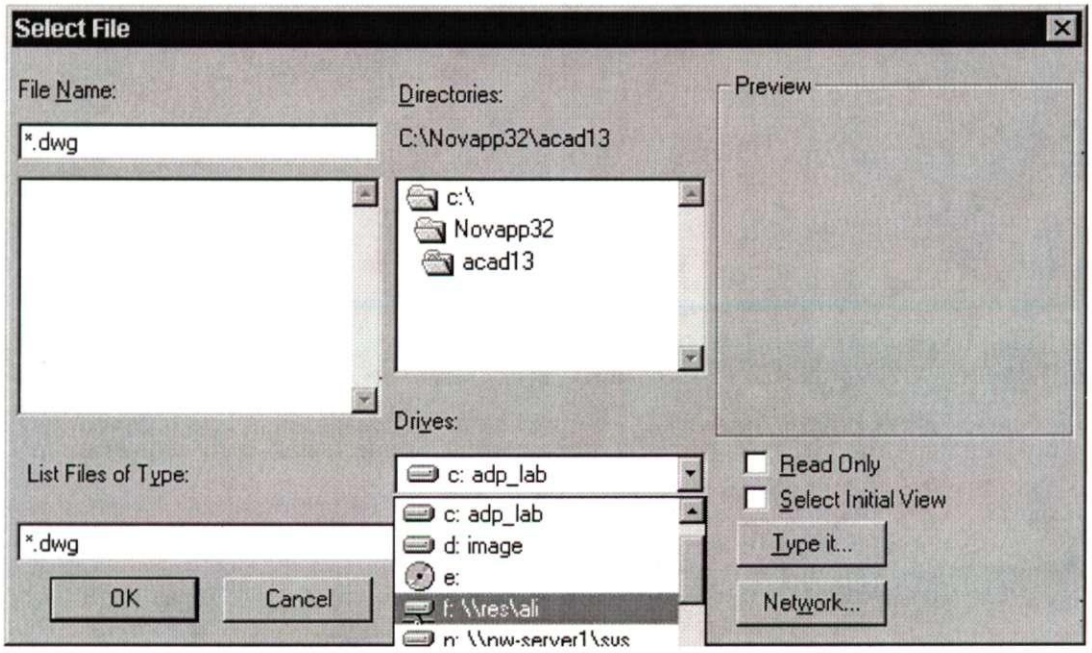


Step two:

To create a new drawing the user should go file. A menu will open offering some selection the user should choose new. A box will come on the screen. There will be two requirements from the user: the first is to name the drawing and the second is on what



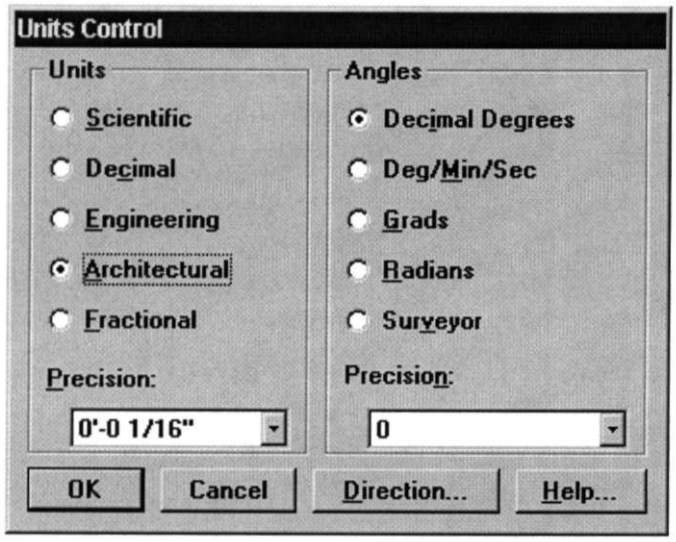
However to load a drawing, click on "Explorer" - it should be listed on the taskbar on the bottom of the screen, select the appropriate Drive and Directory which in our case is drive **F:** and then double-click on the drawing which will be WAM. DWG. If the user can't find the drawing the user should then press F5 (function key 5) this tells Explorer to update the directory display. If the user still can't find the drawing then perhaps, it was saved some other directory. In which case the user can load AutoCAD (via the Program Manager) and then select the File menu, at the bottom of the File menu is a list of recently opened drawings, select the drawing from the list. Go to **file** then **open** you should choose drive **f:** or **C:** depending on where you saved it then when opening **f:** click on WAM DWG. The drawing should appear on the screen.



Step three:

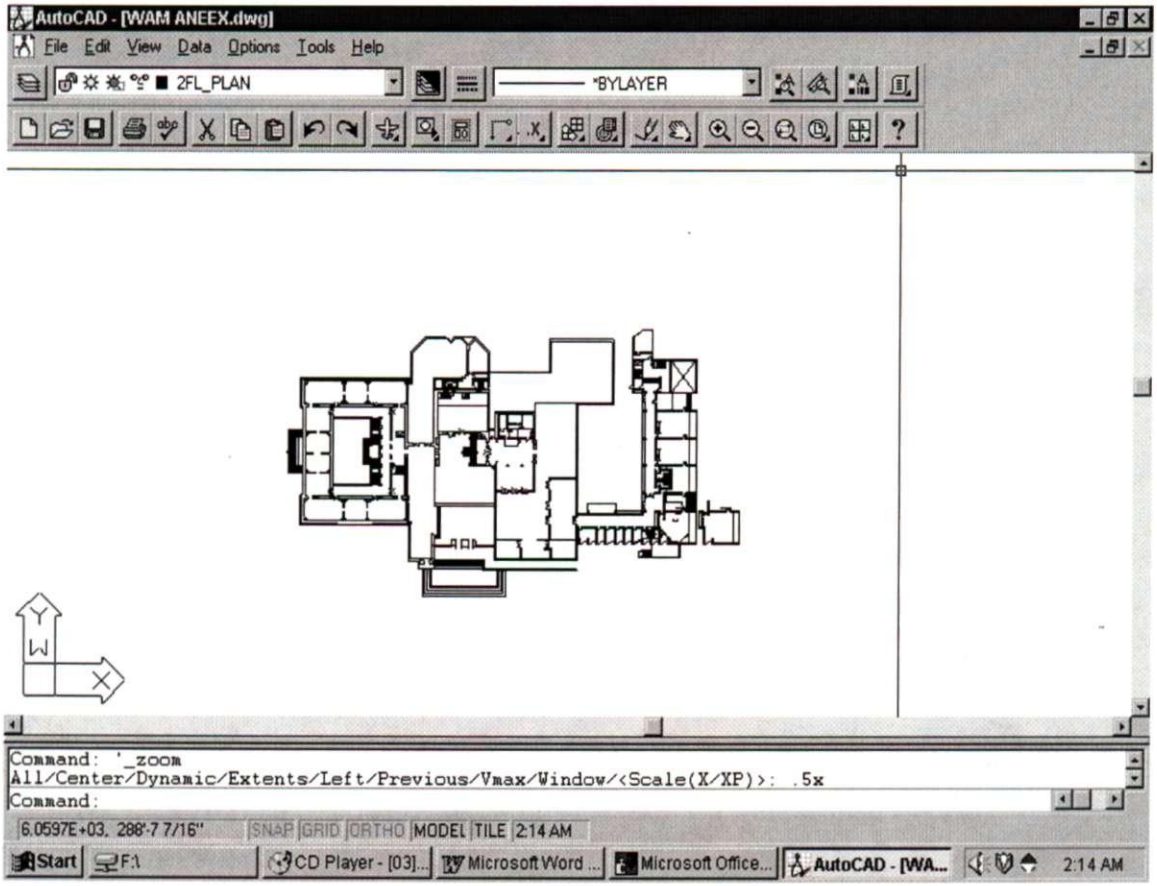
The user should now set up the limits and the units of the drawing in order to have an accurate measurement and a limited drawing. Go to **Tools** then choose **Units** the units box appears for the user select **Architectural** then approve your acceptance by clicking

ok. After the user set up your units set up your limits by entering the command **Limits** then choose what your limit is for the drawing, which in our case is 0.000000-0.000000 form the right corner and 9.000000-12.00000 from the left corner.



Step four:

Once the user are in paper space the user will be able to see the drawing. In order to edit to the drawing the user should go to **view ports** and create it. Once in paper space the user can create a number of views of the drawing, with each a different scale! But the user will create just one view port; select **View - Floating Viewpoint - 1** (or type: **MVIEW).**

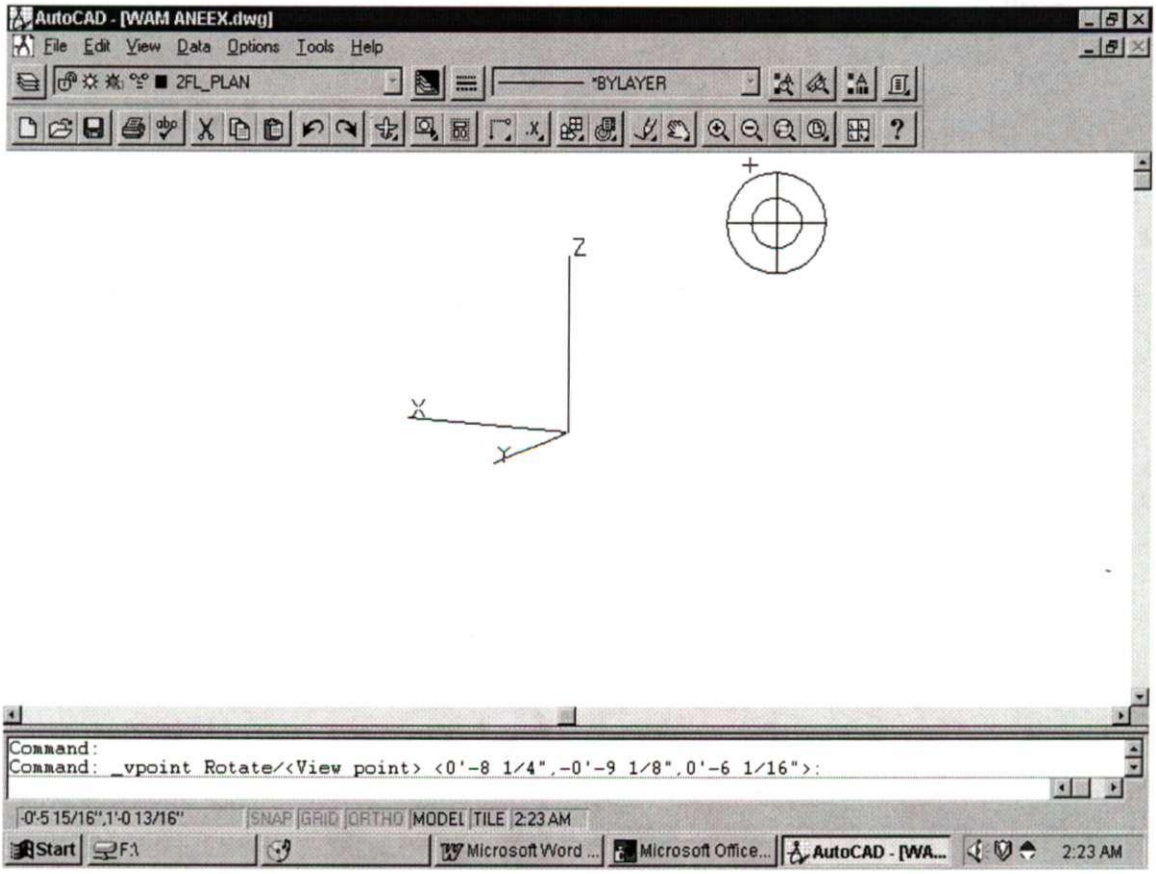


Step five:

The user should Go back to model space Double-click on "PAPER" on the status area or select View - Floating Model Space (or type: **MSPACE**), the "PAPER" on the status area will change to "MODEL". The user should then move the cursor around inside the **viewpoint** and the user will see the normal cross cursor appear. Usually, the user want to have the view at a particular scale but sometimes the user simply want a particular part of the drawing to plot and the user don't care what it's scale is.

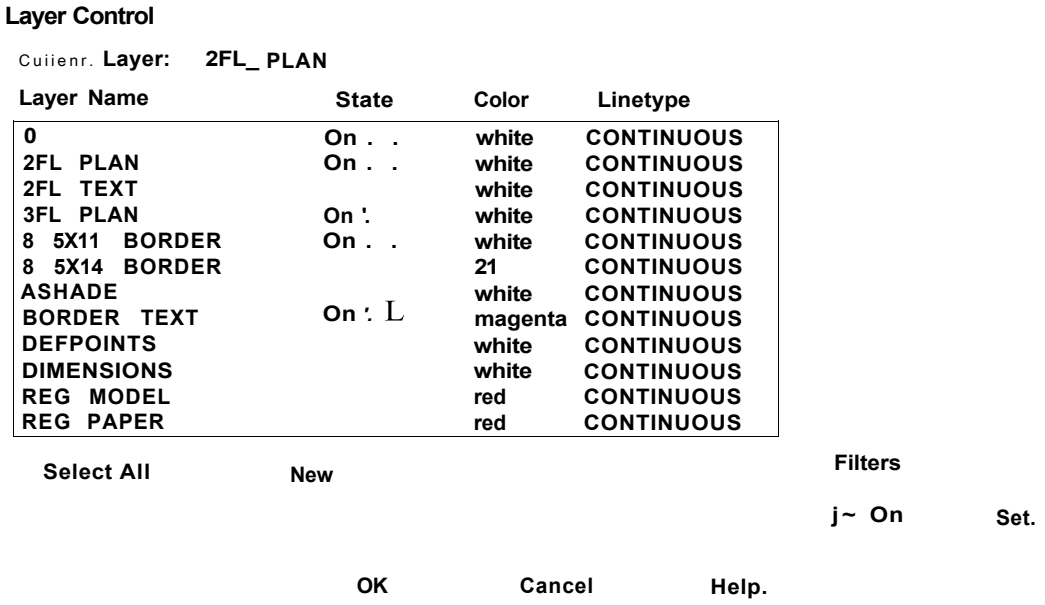
Step Six:

By now every thing is all set to the user to begin the changes in the drawing. For example the user want to change the second floor of the museum from 2D into 3D. First the user have to change the view so in stand of having the X and the Y-axis in the model space the user need to have XYZ all three axis in the model space even though your drawing is still 2D. In order to change the view the user should go to **View** then select view picture, three choices will appear to in the screen Rotate, tripod and vector choose **Tripod.** The user should now be able to see the three axes XYZ.



The user will realize that there are many layers in the WAM DWG drawing and that could confuse the user therefore the easiest way to get around this is to set all the

unnecessary layers (layers that are not in use) **off** temporary and keep the major **plan layer** on.

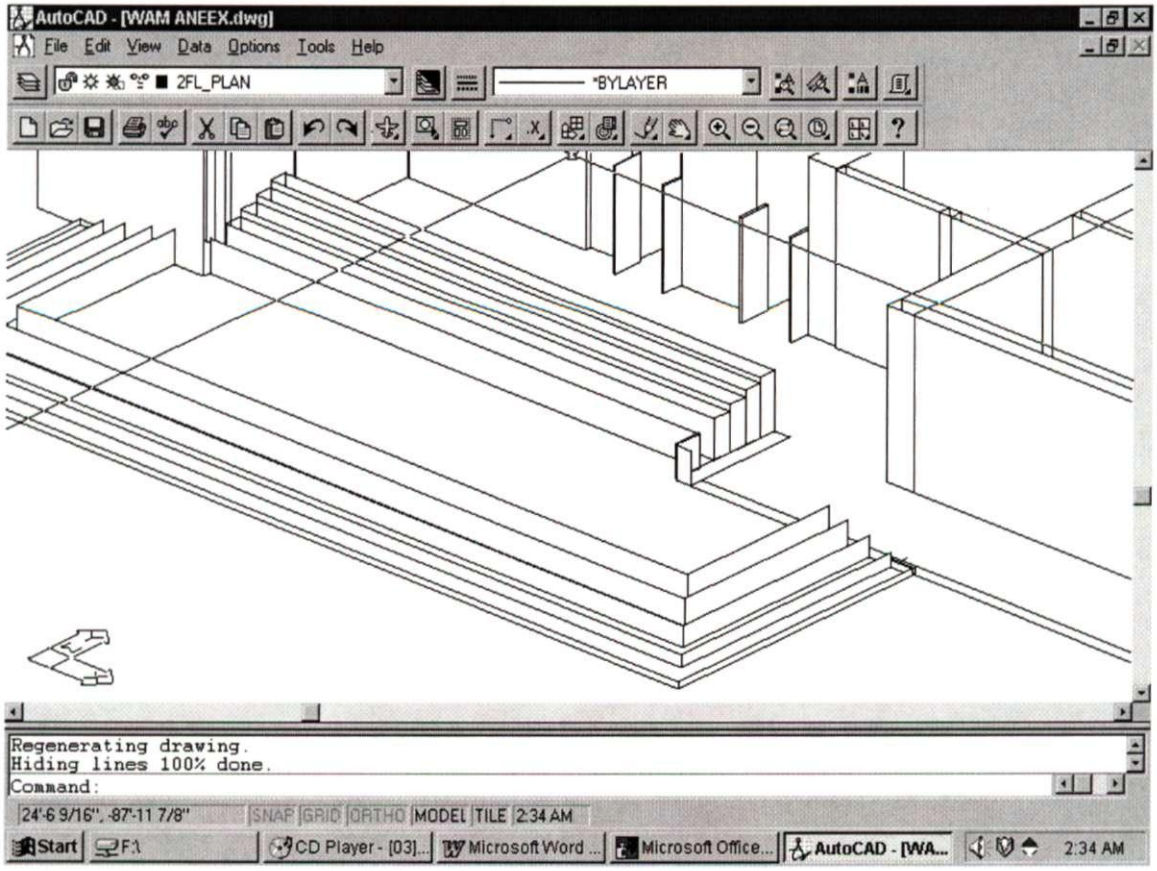


Step Seven:

Since every thing has been set up and the only thing missing now are the changes in the actual drawing. The drawing is in 2D and we need to change it to 3D. Therefore the understanding of **Elevations and Thickness** commands is more than necessary. Since the drawing is in 2D this means that the Elevations are Zero and the wall Thickness are at Zero too. Therefore the user needs to check the plans section A/14-15 to find out what the **Elevations and Thickness** are. The user then should go to Auto Cad and start the editing. First the user should choose the area to be edited (for example the main entrance for the museum). The user should then type command: **THICKNESS** the user will find out that

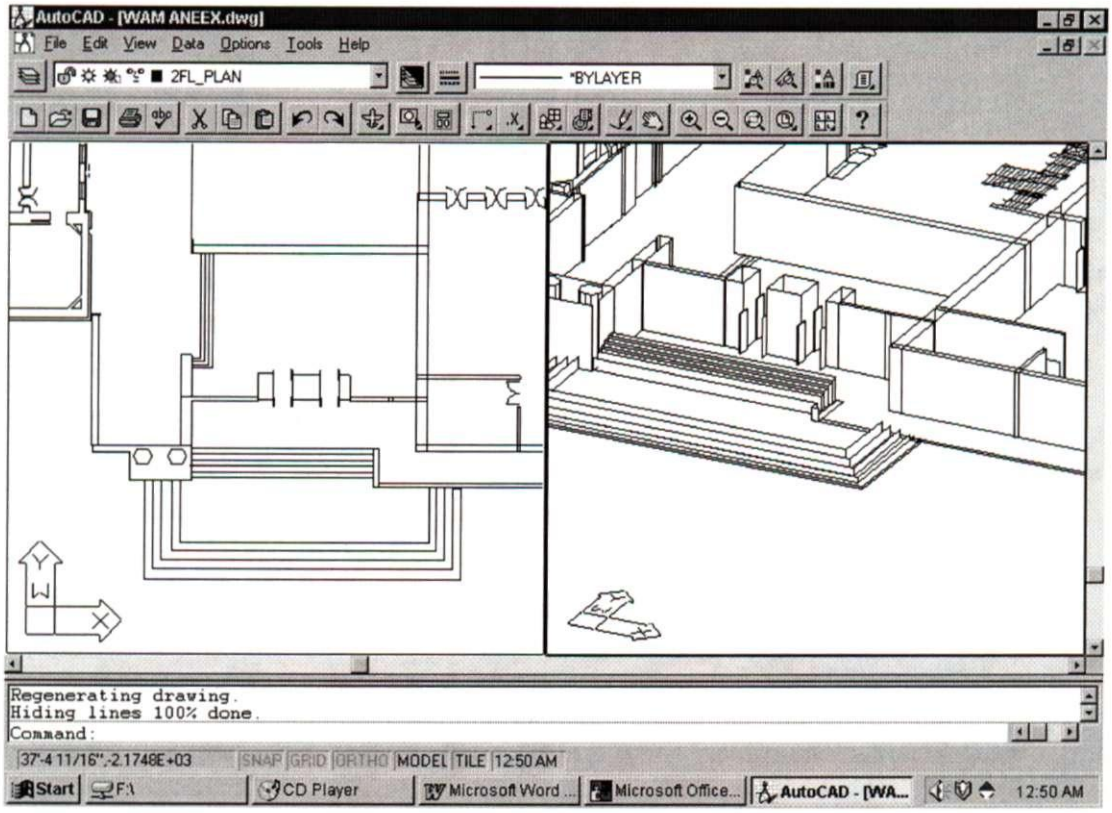
the current thickness of the entrance walls are zero, Enter the new thickness (say 5') the user found out from the drawing plans, then enter ok. By then any thing the user edits to the drawing will have a thickness of 5' until the user changes the thickness. The user next should copy the same previous commands for elevation except the user has to type **ELEVATION** command in stand of thickness.

An easy way to figure what location is provided in the drawing and to know what the thickness and the elevation of the room, lobby, etc are in. The user should use the **layer command.** This will show the user the layers that exist, what each layer represents either a room or a column or the rest rooms. The user can refer to the drawing plans and find out what the heights and widths of the rooms are according to the corresponding layer.



Step Eight:

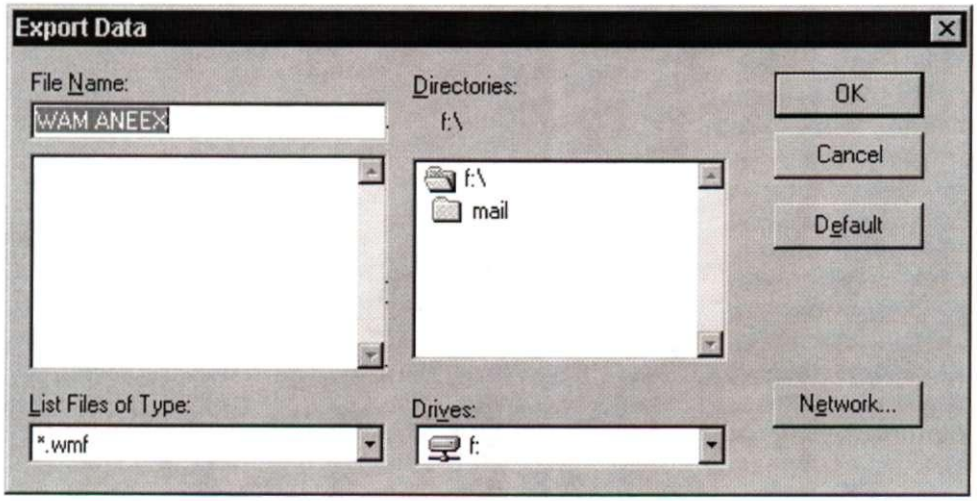
After the user have changed all the elevations and thickness the user will recognize that the drawing has changed from 2D in to 3D. By then the user have accomplished the major goal. Yet there are some difficulties the user will face while dealing with such detailed drawing. The most important one is the amount of data the user is dealing with. In other wards saving it may be necessary and regenerating it is also useful however your drawing may lose some parts of the drawing if it gets very detailed. An another major issue the user could face is assembling the drawing if it exists from more than one floor. Auto Cad is not able to put all the floors on the top of each other so the user can have a unified model for the building. Another minor problem the user cad face is when **Rendering** (will be discussed in more detail in step nine) the drawings in order to move them into any 3D graphics program such as 3Dstuido Max R2.



Step Nine:

This step focuses on how to import and export the files (drawings) for Auto Cad to 3D studio Max R2. First the user have to go to File then choose export. After the user has chosen export a box in Auto Cad will appear in the screen (usually the command box) and will ask the user to select the objects that will be exported, the user should select the parts of the drawing that wanted to exported. An other box will appear named the export file in this box there is a question about list type of file, the user will see many selections the most appropriate choice in this case will be (*.3ds) then the user should indicate the approval by clicking ok. By then Auto Cad will automatically render the drawing so it

will be ready to be exported in 3D studio Max R2. The next goal is to import the files into 3D studio Max R2.



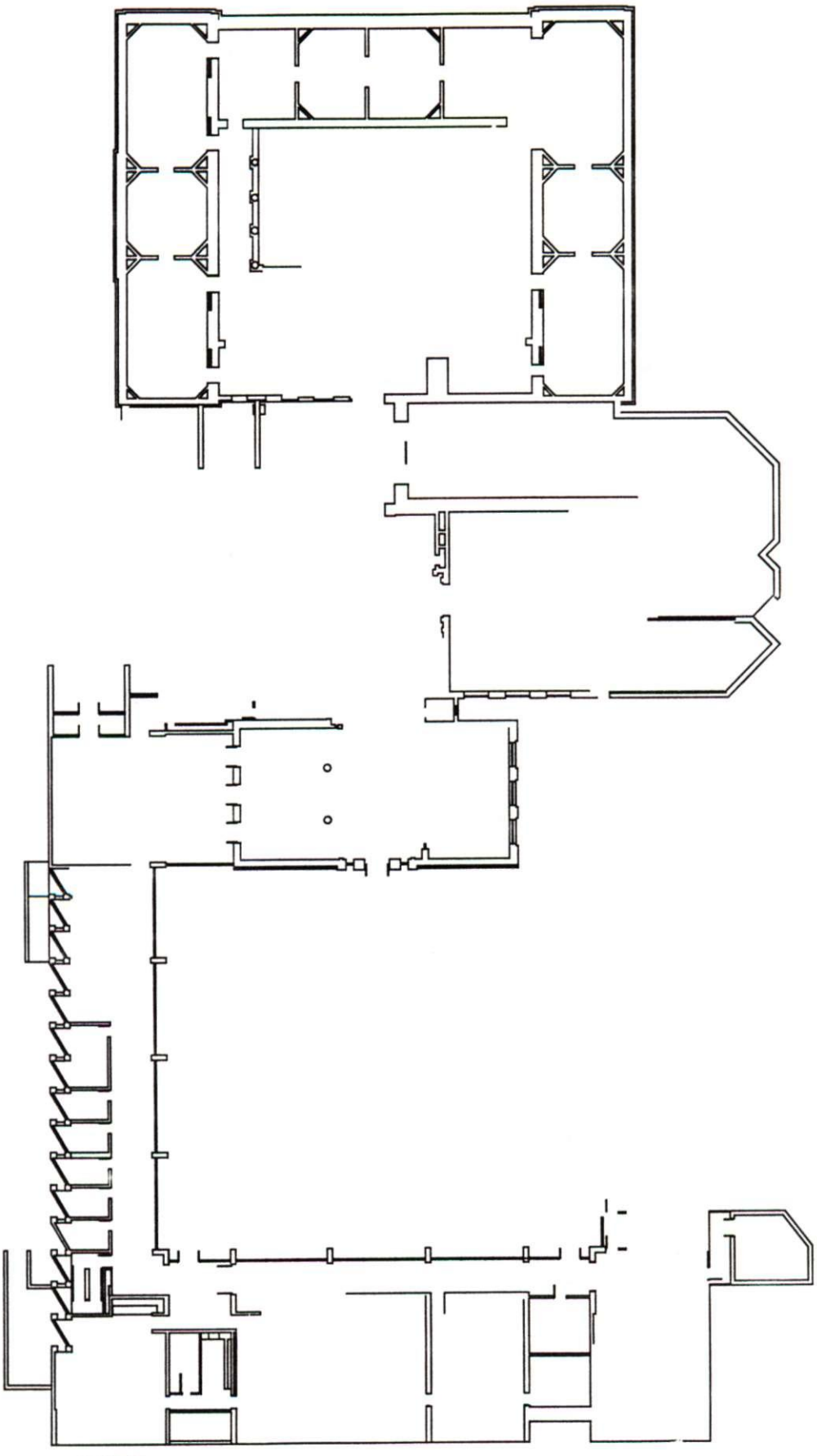
1

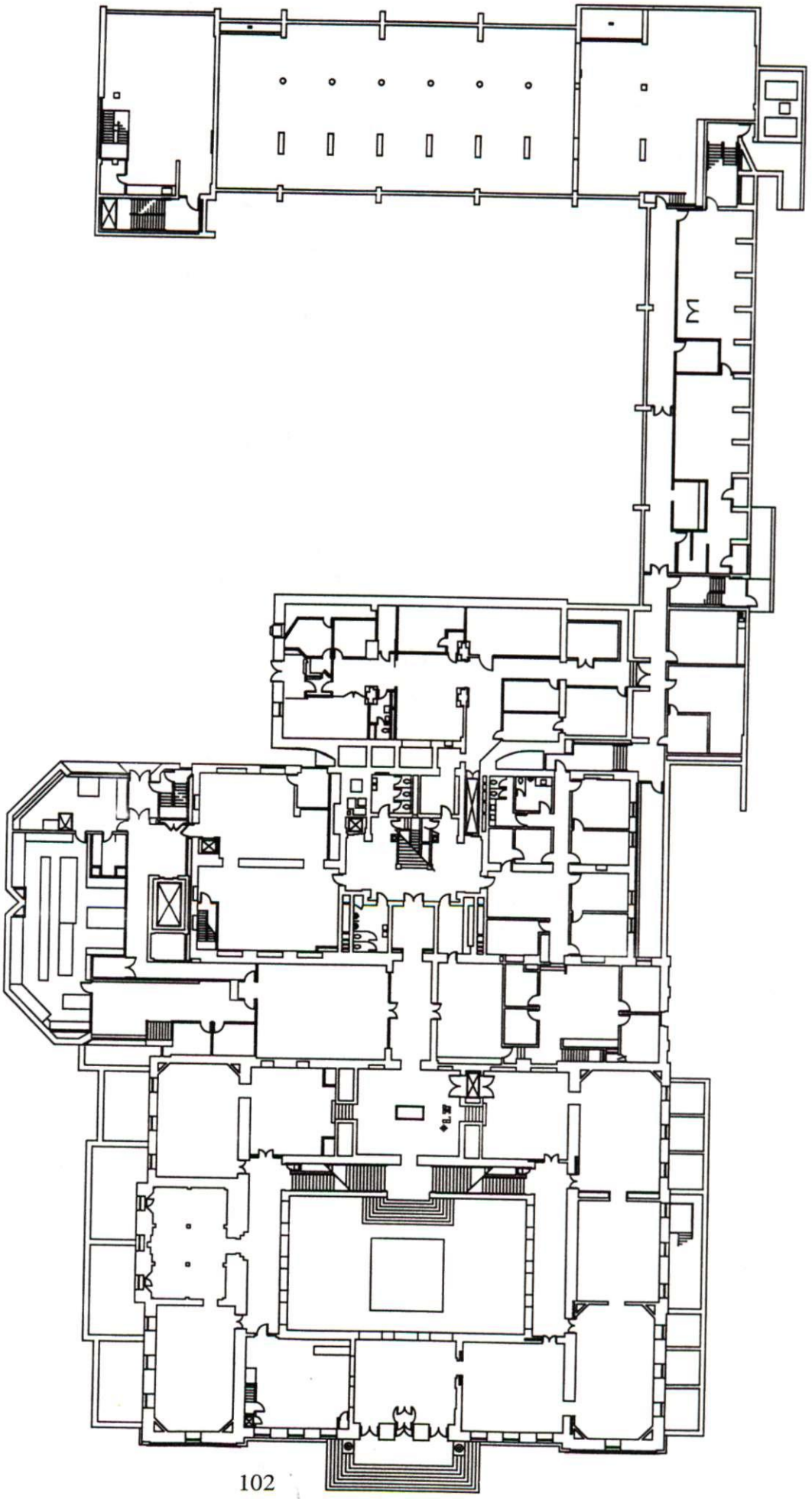
Finally the user should by now be capable of drawing and producing some artistic work.

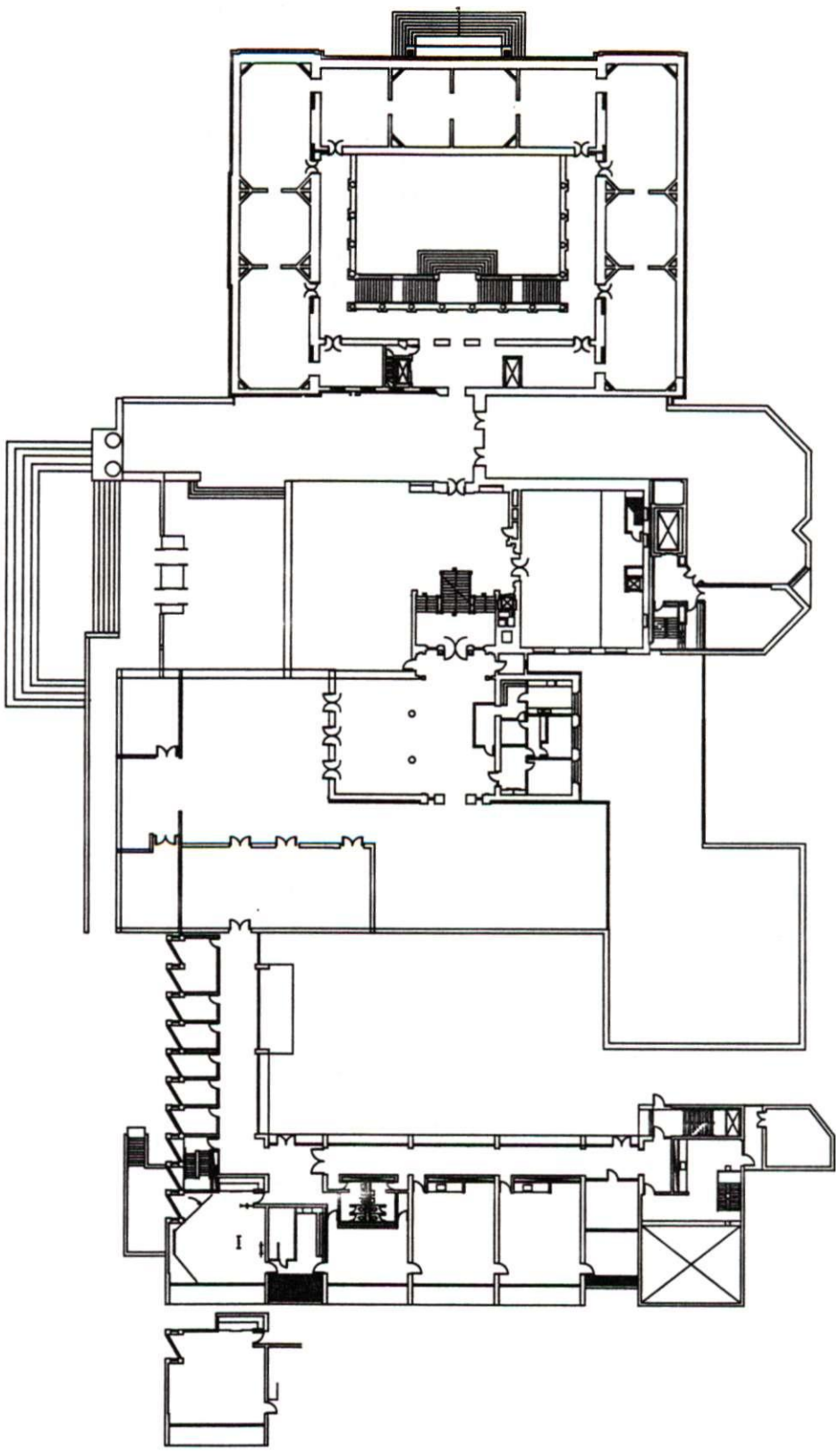
APPENDIX B:

2D Drawings of the WAM.

In the following few pages, the reader will find the original 2D drawings that we got from the WAM.



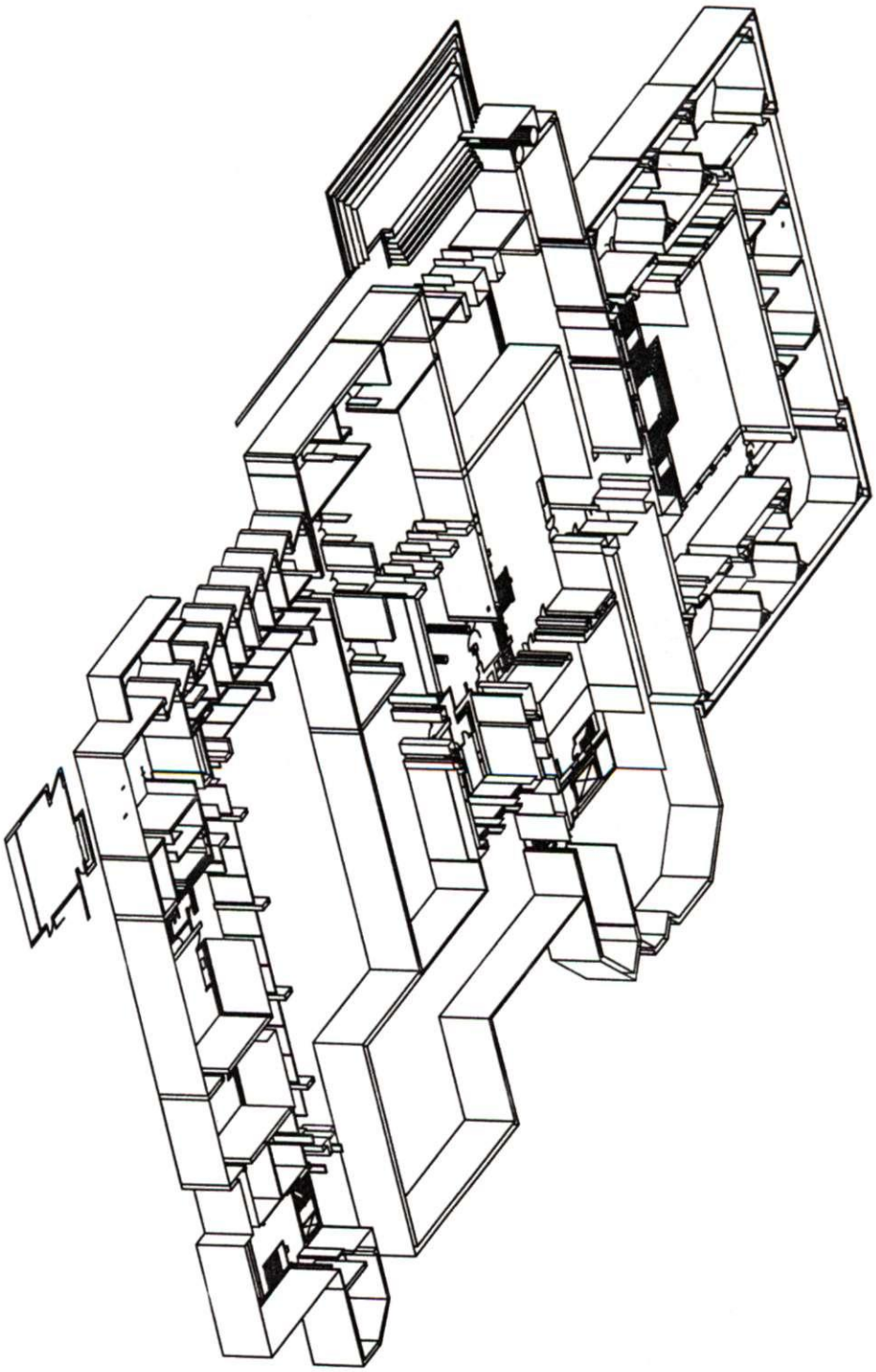


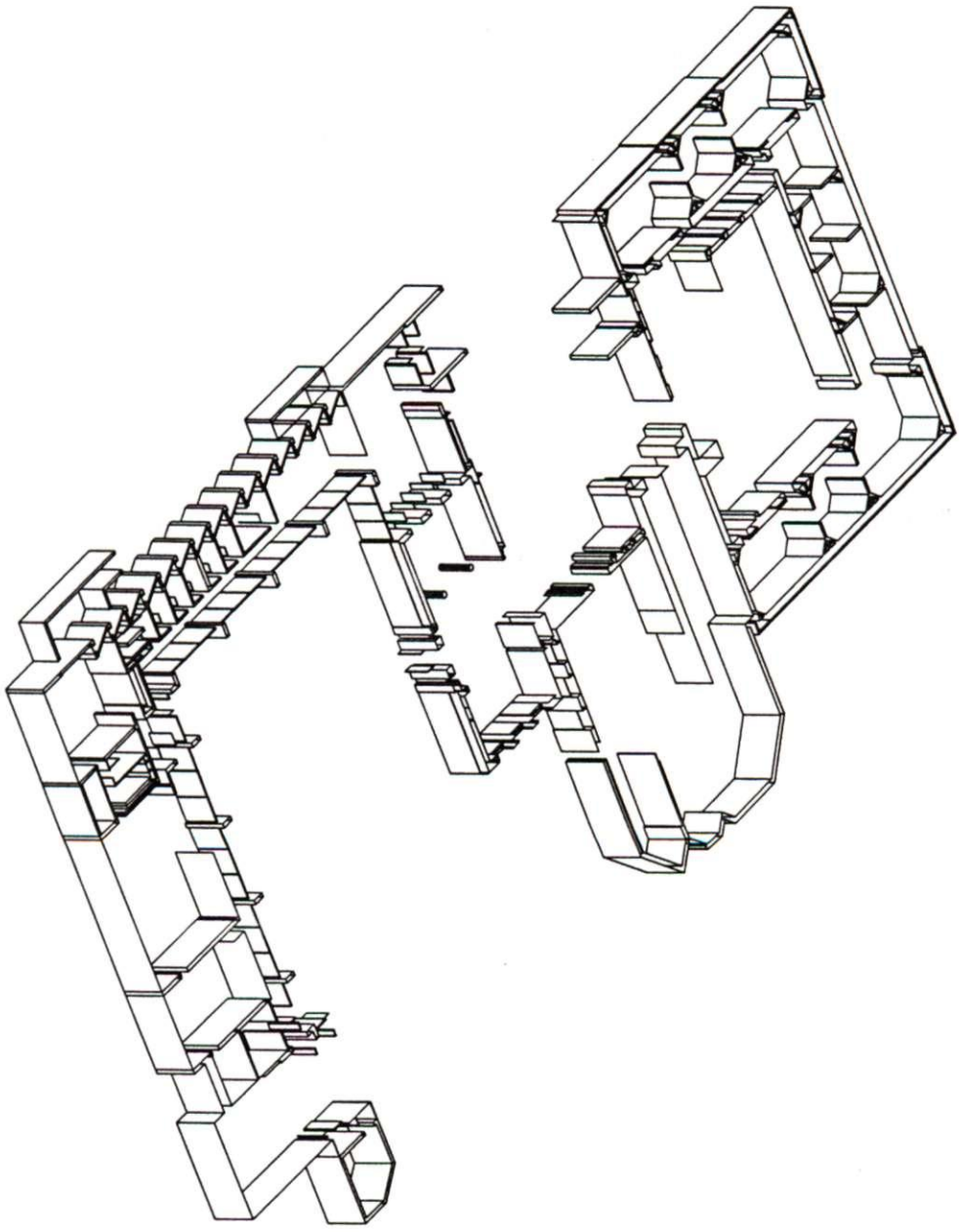


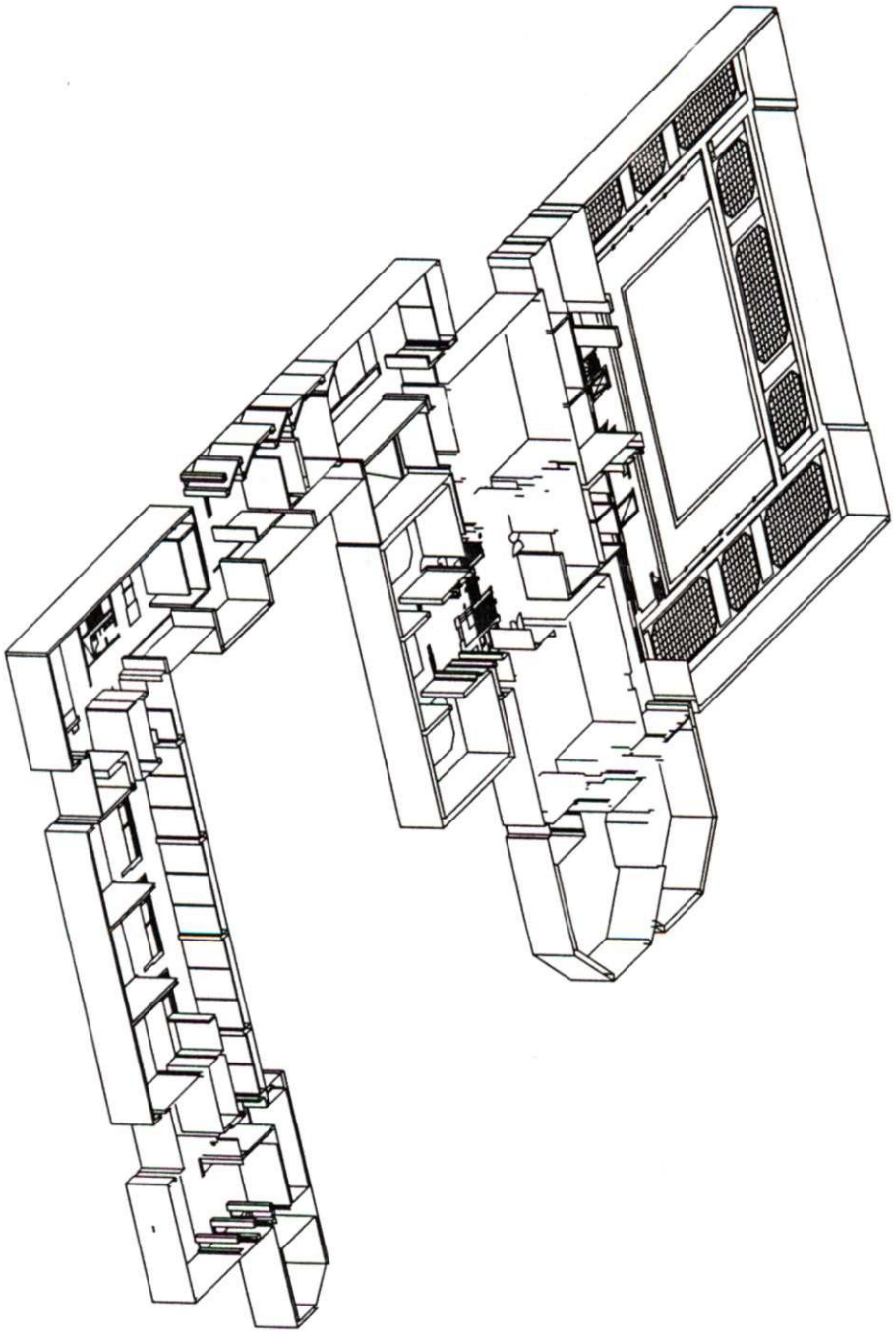
APPENDIX C:

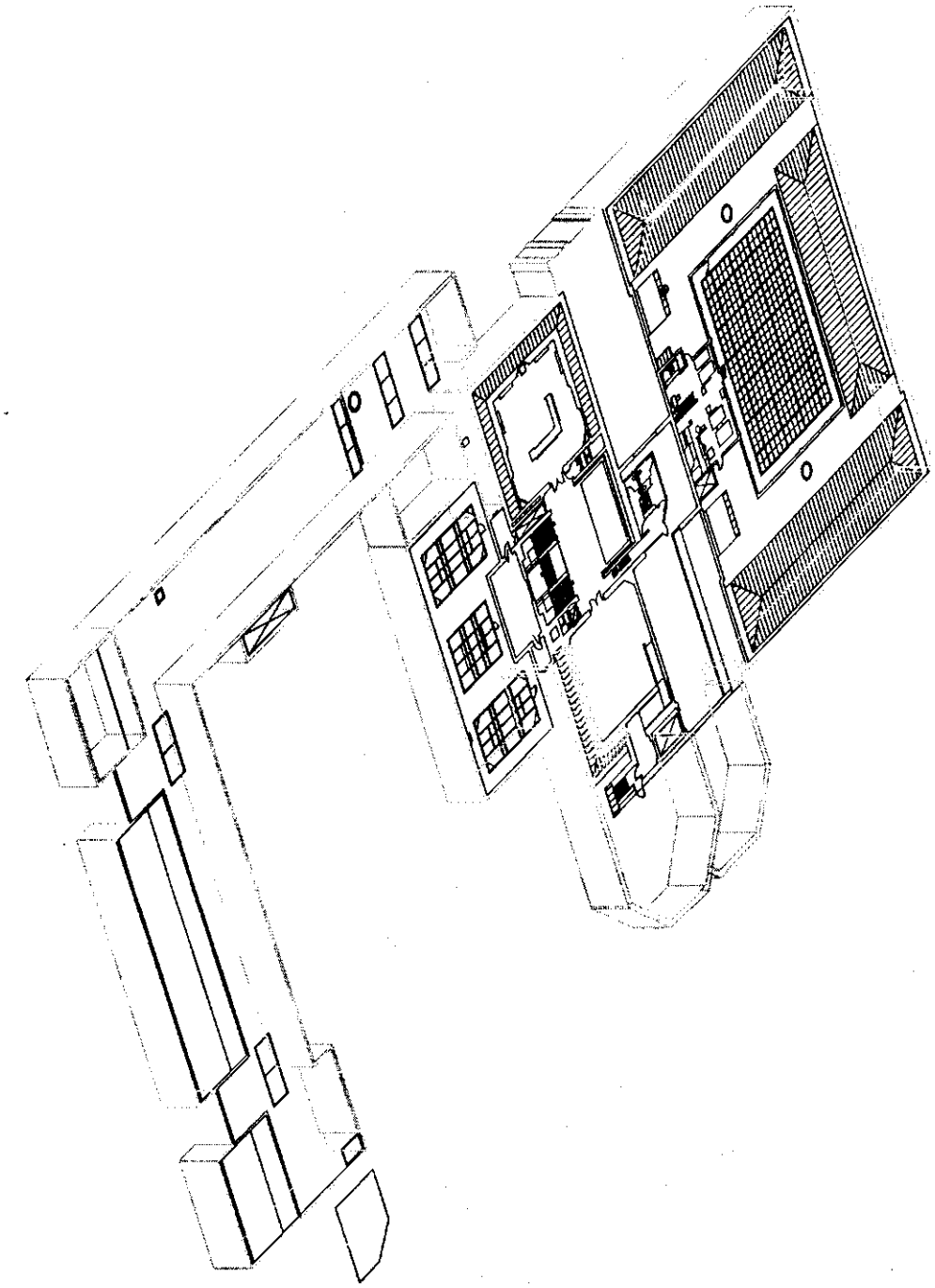
3D Drawings of the WAM.

In the following few pages, the reader will find the 3D drawings that developed for the WAM.









Appendix D:

3D Studio MAX R2 Tutorial:

Choosing the Software

We decided to use 3D Studio MAX along with along with AutoCAD to create the model and the animations of the museum. We based our decision upon the results of a survey of 80 companies that specialized in creating 3D models and animations for construction purposes. We contacted each company asking them what software they prefer to use for their work. 28 companies responded.

The following are our survey results:

Modeling	
AutoCAD (any version)	20
AutoCAD 13	2
AutoCAD 14	12
Animation	
3D Studio MAX	17
3D Studio VIZ	6
Form Z	4
Accurender	4
ArchT	1
Softimage	1
Alias	1
Respondents	28

AutoCAD and 3D Studio MAX are clearly favorites. Both of these software packages were available for student use at WPI. Thus, we decided that we'd use them.

What You Need to Know

In order to understand how to use this tutorial, it is assumed that you are familiar with using Windows NT, AutoCAD and 3D Studio MAX (3DS). Reference manuals and tutorials for all of these software packages are available to WPI students.

Understand that 3DS is an especially challenging software package to learn. If in the proceeding sections there is a 3DS term that is used that is unfamiliar to you, consult the "3DS User's Guide" or the "3DS Tutorials" books. The purpose of the tutorial section in this document is not to take the place of the manuals provided by the makers of AutoCAD or 3DS. Instead, the purpose is to show what features of each of the software packages were used in this IQP to create a 3D model.

Working through the tutorials in chapters 1-6, 10-14 and 16-17 in the "3DS Tutorials" book should provide sufficient knowledge to implement the instructions below.

Working with the CD

The CD provided with this report contains the AutoCAD drawings, the converted AutoCAD drawings, and the final 3D Studio MAX model of the WAM. In case you would like to redo our work on the WAM for your own educational purposes, the paths of these files on the CD will be indicated at the beginning of each major step in the creation of the 3D model. Also, a picture will be shown to indicate what the final results of each major step should look like.

Creating a 3D Model from an AutoCAD Drawing

The first step begins with AutoCAD. The 3D AutoCAD drawing must be translated into a "3DS" file, which 3D Studio MAX can understand. To do this:

- Load your AutoCAD file into AutoCAD. On the CD drive, these files are located on the CD in the "WAM\AutoCAD" directory.

- Export the AutoCAD file into 3DS format.
    - When prompted to select objects to export, select *all* objects.

- When prompted to specify the 3D Studio File Export Options, accept the default values. More information on each option is available through the AutoCAD online help system.

- If the AutoCAD model of your building consists of many files, e.g.-one for each floor, then you will need to repeat the above process for each file. Each component of the model can then be reconstructed into a single model in 3D Studio MAX.

Using 3D Studio MAX

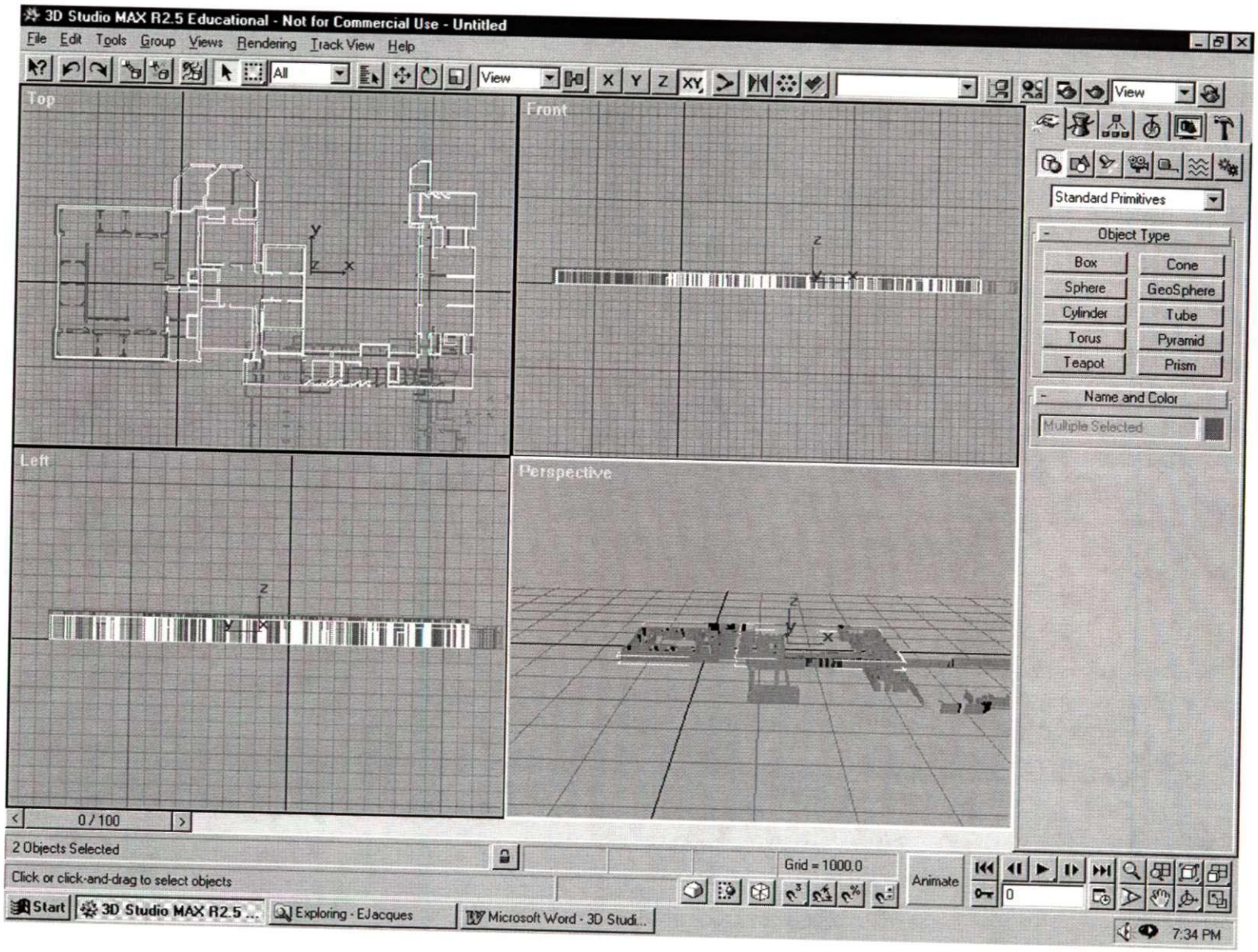
Importing ".3ds" Files Into 3D Studio MAX

The following procedure guides you through the process of reconstructing the 3DS file(s) into a single 3D Studio model. Start with the 3DS output file for the model of the lowest level in your building. You can find these files on the CD in the "WAMXAutoCAD" directory. The files are named wam_1, wam_2, wam_3, and wam_annex. The number in the filename corresponds to the level of the building imported from AutoCAD. The wam_annex file is the second level of the museum, modified to incorporate the annex that is to be built.

Import the ".3ds" files into 3D Studio MAX, one at a time. A "3DS Import" dialog box pops up onto the screen. Select the "Completely replace current scene" radio button, if you wish to create a new scene. Select the "Merge objects with current scene" if you want to add the object to a model that you have been editing.

Repeat this process for each 3DS file.

When you are done, your screen may look something like this:


3D Studio MAX R2.5 Educational - Not for Commercial Use - Untitled
File Edit Tools Group Views Rendering Track View Help
Top
Front
Left
Perspective
Standard Primitives
Object Type
Box
Cone
Sphere
GeoSphere
Cylinder
Tube
Torus
Pyramid
Teapot
Prism
Name and Color
Multiple Selected
0 / 100
2 Objects Selected
Click or click-and-drag to select objects
Grid = 1000.0
Animate
Start
3D Studio MAX R2.5 ...
Exploring - EJacques
Microsoft Word - 3D Studi...
7:34 PM

Reorienting the Components of Your 3D Model

Now, you have each component of the building imported into 3D Studio MAX. The following steps describe how to reorient each of the components of the building model so that they make one complete building.

- You may notice that all of the levels of the building are at the same elevation, ground level 0. To change this to make it easier to see your objects:

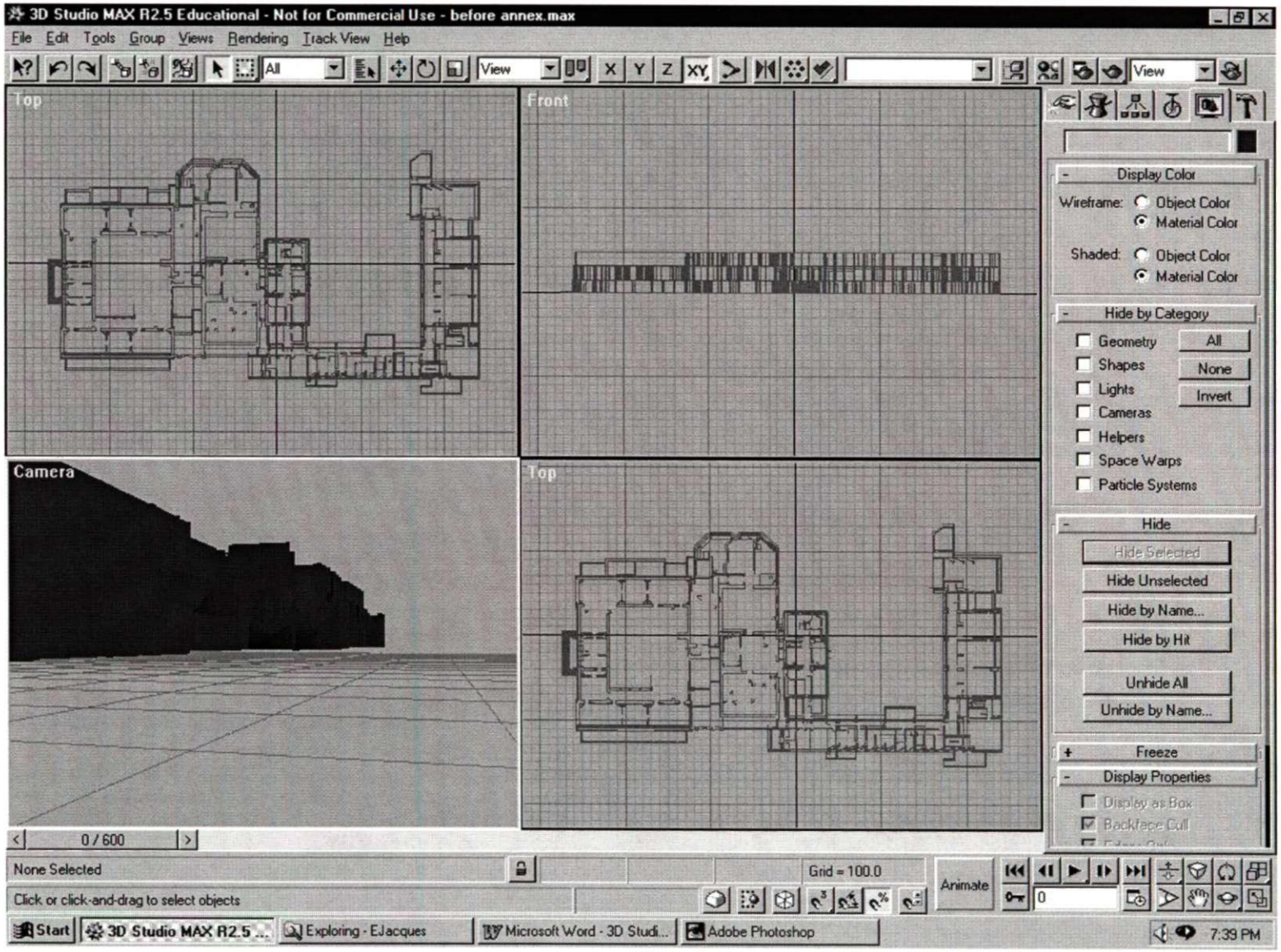
    - Look at the "Left" or "Right" view port.
    - Click the "select and move" button.
    - Make sure you are in the "view" coordinate system. You may want to lock movements along the axis corresponding with vertical movement. This should be the Z-axis.
    - For each of the level of the building, select it (perhaps by name), and move them so that they are separated at the right heights. Do not yet worry about the differences in height being exact. Make sure the first level is on ground 0, basement levels are below it, and the levels above are in the appropriate order.

- Look at the "Top" view port. If some of the components of the building appear to be rotated, it will be necessary to rotate certain parts of your model to reorient them. To do this:

- Turn on "percent snap" to rotate cleanly. Set the "grid/snap" settings "percent" settings to a good value to round to, like 10%.
- Click the "select and rotate" button.
- Select the object you wish to rotate. If objects are overlapped, it's easiest to select the object to be rotated by name.
- Rotate your selection by clicking and dragging.

Now you may notice that some of the components of the building are not aligned in the "Top" view port. To alleviate this problem:

- Maximize the "Top" view port.
- Do a "Zoom Extents" to see every object in your building scene.
- Align the components of the building as best you can at this level of zoom.
- Zoom in on a corner of the building so that you can align the levels of the building even better. Use "select and move" to move the levels of the scene so that they are on top of one another.
- Repeat the last two steps until the levels of the building are aligned one on top of another.
- When you are done, your model may look something like this:


3D Studio MAX R2.5 Educational - Not for Commercial Use - before annex.max
File Edit Tools Group Views Rendering Track View Help
Top
Front
Camera
Top
Display Color
Wireframe: Object Color
Material Color
Shaded: Object Color
Material Color
Hide by Category
Geometry
Shapes
Lights
Cameras
Helpers
Space Warps
Particle Systems
All
None
Invert
Hide
Hide Selected
Hide Unselected
Hide by Name...
Hide by Hit
Unhide All
Unhide by Name...
Freeze
Display Properties
Display as Box
Backface Cull
0 / 600
None Selected
Grid = 100.0
Animate
Click or click-and-drag to select objects
Start
3D Studio MAX R2.5 ...
Exploring - EJacques
Microsoft Word - 3D Studi...
Adobe Photoshop
7:39 PM

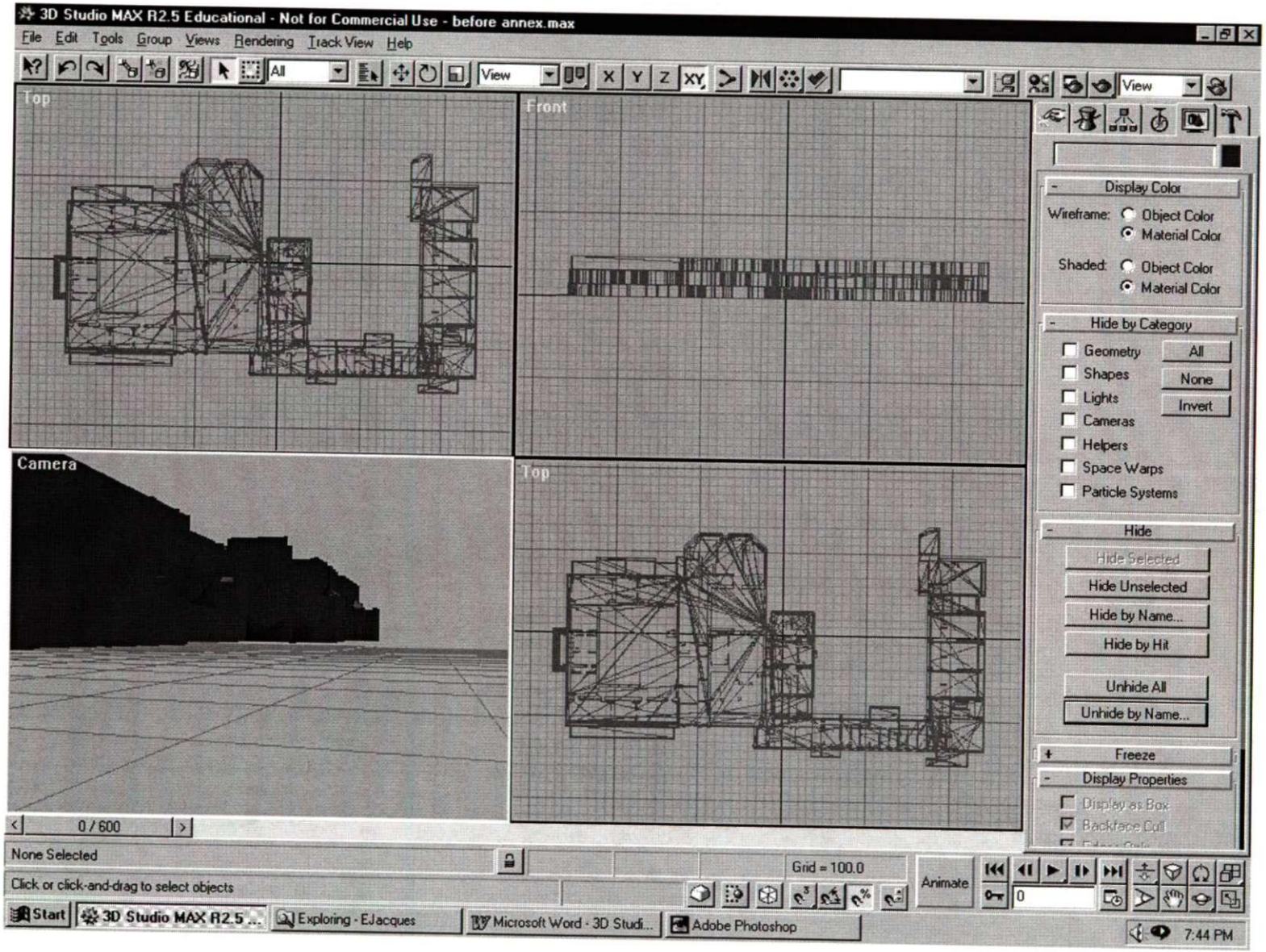
Creating Floors Between the Levels of the Building

- Now, you need to create an actual floor between the levels of the building. To do this:
    - Pick a level in the building. Select it.
    - Select a portion of the level in the building that is small enough so you can clearly see the details of the walls.
        - Copy this level of the building. Rename it to something like "floor."
        - Hide all other objects in the scene besides the new floor object.
        - Get a side view of the floor. Do a "Zoom Extents" so that you can see the entire level of the building.
        - Go into "Edit" mode to edit the object.
        - Select "Vertex" sub-object mode.
        - Select all of the vertices that *do not* make up the top of the walls.
        - Delete all of these vertices.
        - Select "Polygon" sub-object mode. The entire floor should disappear, because now it is only a bunch of vertices on the same plane.
        - Create polygons (triangles) that fit together snugly to construct the floor.
        - Move to another portion of the building, and repeat the above steps until the entire floor is constructed. You may want to leave some holes in the floor for stairs, or rooms that span multiple floors.
    - Do a "Zoom Extents" to get the entire floor in view.

- Switch the view mode to "Shading w/Highlights" so that you can see the object you created.
- Fix any unexpected holes in your floor caused by triangles not appearing. You can do this by going in to "reverse normal" mode and selecting the polygons that are not showing up.
- Extrude the floor to the thickness you would like it to be.
- Unhide the other objects in your model. Move the location of the new floor that you have created to a desired position.
- Repeat this process for each floor that you would like to create. *This is a tedious and time-consuming process.*

Move each level of the building so that they now fit snugly on top of one another, into one completed building.

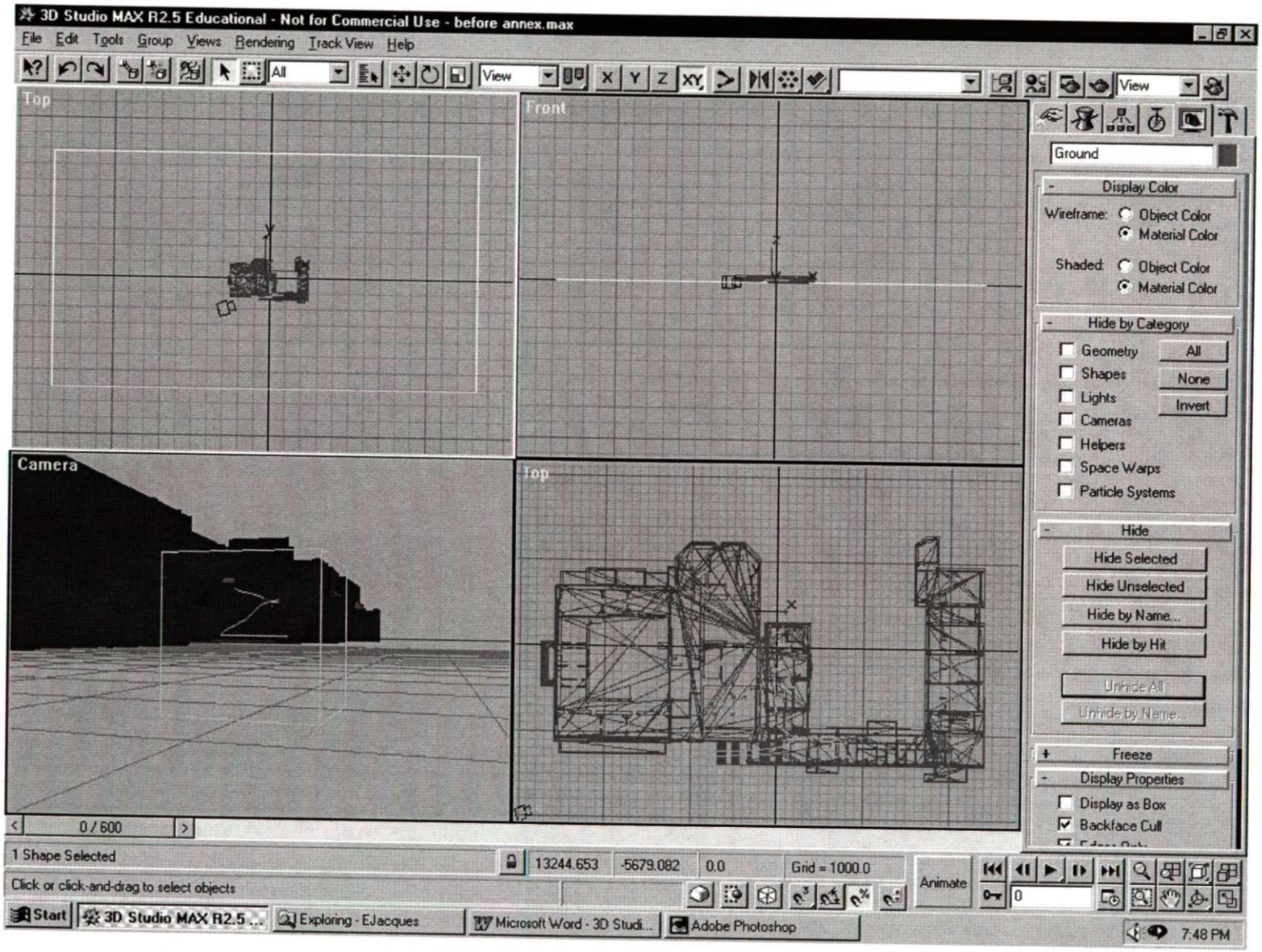
When you are done, your model may look something like this:


3D Studio MAX R2.5 Educational - Not for Commercial Use - before annex.max
File Edit Tools Group Views Rendering Track View Help
Top
Front
Camera
Top
Display Color
Wireframe: Object Color Material Color
Shaded: Object Color Material Color
Hide by Category
Geometry All
Shapes None
Lights Invert
Cameras
Helpers
Space Warps
Particle Systems
Hide
Hide Selected
Hide Unselected
Hide by Name...
Hide by Hit
Unhide All
Unhide by Name...
Freeze
Display Properties
Display as Box
Backface Cull
0 / 600
None Selected
Grid = 100.0
Click or click-and-drag to select objects
Animate
Start
3D Studio MAX R2.5 ...
Exploring - EJacques
Microsoft Word - 3D Studi...
Adobe Photoshop
7:44 PM

Finishing Touches

Now, we have a complete building defined in 3D Studio MAX R2. At this point, you may wish to decorate the building model a bit.

- To simply create a level ground, just make a very large rectangle.
- Each level in the museum is an editable mesh object. In order to be able to "paint" individual walls, it will be necessary to edit each mesh by hand, and create new objects from selected faces of the mesh.
- To make the walls and floors look better, apply textures to them using the material editor. The more texture you have in your model, the longer it will take to render.
- Check to be sure that all of the walls that compose the interior of your model look accurate. To do this:
    - Look at each individual level in a full-screen "Perspective" view port.
    - Hide all the other objects in the scene so you can get a clear view.
    - Look from the top down into the building from an angle. Check for triangular portions of walls that are missing.
    - Get into "Edit" mode, "Polygon" sub-object mode, "Reverse Normals" mode.
    - Click on each apparently missing wall, and it will reappear. Missing components of the wall will reappear, one triangle at a time.
    - When you are done adding a floor and maybe some more stairs, your model may look something like this:


3D Studio MAX R2.5 Educational - Not for Commercial Use - before annex.max
File Edit Tools Group Views Rendering Track View Help
Top
Front
Camera
Top
Ground
Display Color
Wireframe: Object Color Material Color
Shaded: Object Color Material Color
Hide by Category
Geometry All
Shapes None
Lights Invert
Cameras
Helpers
Space Warps
Particle Systems
Hide
Hide Selected
Hide Unselected
Hide by Name...
Hide by Hit
Unhide All
Unhide by Name...
Freeze
Display Properties
Display as Box
Backface Cull
0 / 600
1 Shape Selected
13244.653
-5679.082
0.0
Grid = 1000.0
Click or click-and-drag to select objects
Animate
Start
3D Studio MAX R2.5 ...
Exploring - EJacques
Microsoft Word - 3D Studi...
Adobe Photoshop
7:48 PM

Making the Animation

Now, we would like to create an animated view of the building. To get a sneak preview of what the final 3D model should look like, see the final 3D model file located in the "WAMY3D Studio MAX" directory. The before_annex.max and after_annex.max files are our final 3D models of the WAM before and after the annex was added, respectively

- Increase the number of frames in your animation to reflect the quality of the animation that you would like to create. Assume that your animation will be run at about 30fps, and consider the amount of time you wish to take to traverse through your building. For instance, if you would like to create a 30 second animation of the museum at 30fps, it will take 900 frames. You can increase the number of frames in the "Time Configuration" dialog box.
- Create a curved spline that represents the path that you would like the camera to travel in the building. Name this object "Camera Path."
- Create a dummy object. Name the object "Camera Path Dummy."
- Assign a controller to the camera path dummy to control its position. Assign the position of the dummy to "Path." Select the check-box for "constant velocity" to make the dummy move along the path at a regular speed.
- Under camera parameters, select "Pick Path." Select the camera path spline.
- Copy the spline. Rename it to "Camera LookAt Path."
- Modify the new spline so that it will define a path along which you would like a camera to look at.

Create a dummy object. Name the object "Camera LookAt Dummy."

Assign a controller to the camera path dummy to control its position. Assign the position of the dummy to "LookAt Path." Select the check-box for "constant velocity" to make the dummy move along the path at a regular speed.

Create a target camera.

Use the "Attachment Controller" to attach the position of the camera to the "Path" dummy, and the camera target to the "Camera LookAt Dummy," respectively.

Get a top view of the region in which the camera will be traveling.

Now, edit the path of the camera and its target in detail.

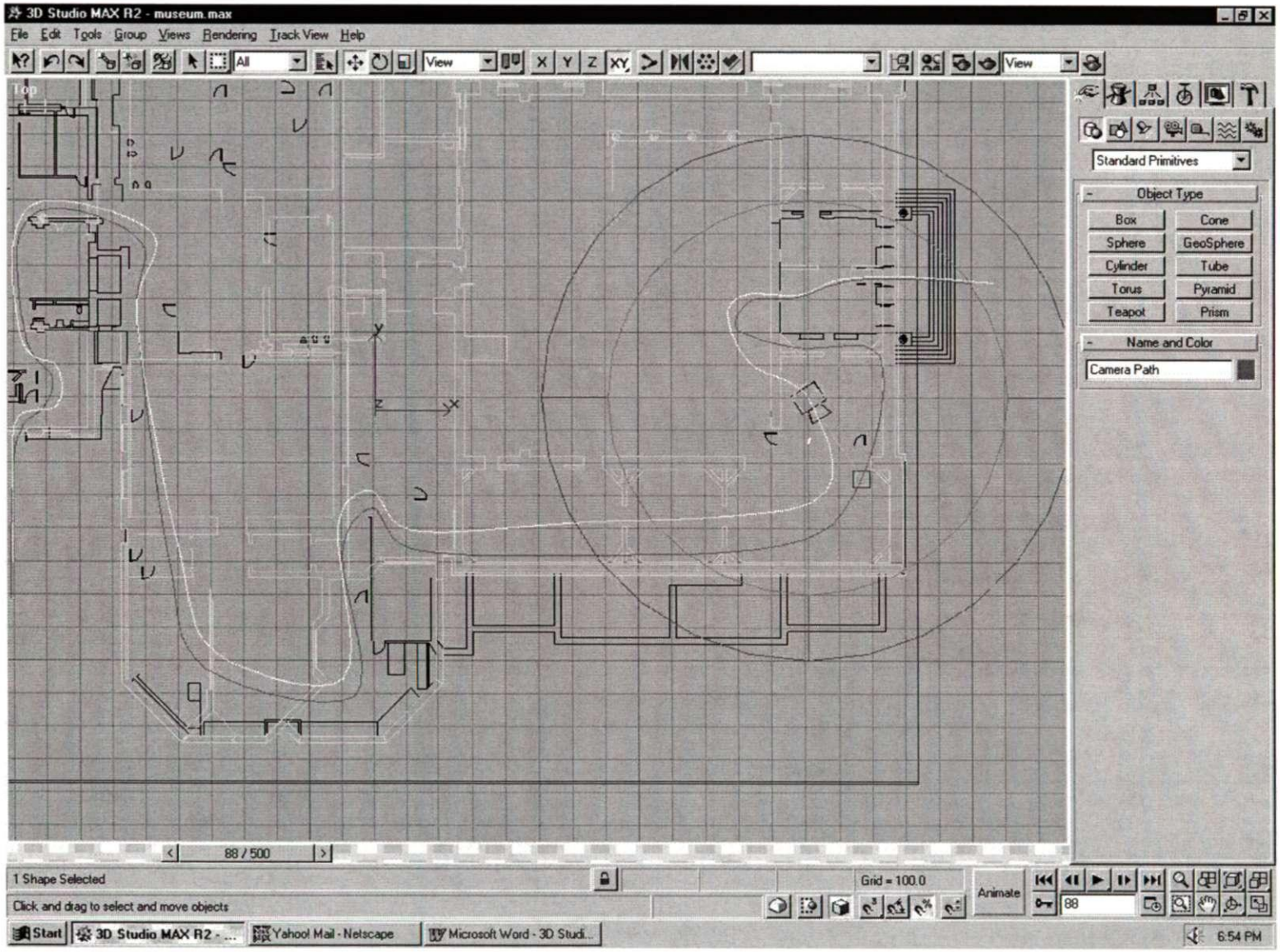
- Advance the animation five frames.
- Tweak the position of the "Camera LookAt Dummy" along the path it is traveling to create the desired effect of a person walking along the path, with head turned, looking at a wall in front of him or her.
- Repeat the last two steps. *This is a tedious and time-consuming process.*

View the animation in its entirety in a top view port, and again in a camera view port, to be sure that you are creating the desired results. Continue to adjust the animation to the best of your artistic ability and knowledge of 3D Studio MAX.

Render the final animation. This can take as long as half a day. You can estimate how long it will take to do this by multiplying the time it takes to render one frame by the number of frames that will be animated. I rendered the animation to 320x200x24-bit

uncompressed AVI to get the maximum quality. A 900 frame animation in this format can be well over 200MB large.

When you are done making your animation, your modeling screen may look something like this:


3D Studio MAX R2 - museum.max
File Edit Tools Group Views Rendering Track View Help
All
View
X Y Z XY
View
Top
Standard Primitives
Object Type
Box
Cone
Sphere
GeoSphere
Cylinder
Tube
Torus
Pyramid
Teapot
Prism
Name and Color
Camera Path
88 / 500
1 Shape Selected
Grid = 100.0
Click and drag to select and move objects
Animate
88
Start
3D Studio MAX R2 - ...
Yahoo! Mail - Netscape
Microsoft Word - 3D Studi...
6:54 PM

Appendix E:

Questionnaire of the WAM personnel:

Please help us by answering the following questions:

1. Who are your potential donors?

2. What marketing techniques does the WAM use to convey the message to these donors?

3. What kind of foundations or organizations does the WAM approach to request money from?

What is the the income bracket of the individuals from which the WAM gets its funding.? (Please indicate that in percentages, 100% for all the individuals)

____% Less than $50,000 a year
____% Between $50,000- $100,000 a year
____% Between $ 100,000- $200,000 a year
____% More than $200,000 a year

5. As of now, what percentage of the entire donor population has been contacted?

_____Less than 10%
_____Between 10%-50%
_____Between 50%-90%
_____More than 90%

What are the techniques that the WAM use for fundraising?

6. What do you think - As a member of the board at the WAM- of the idea of using Virtual Reality for fundraising purposes?

_____No need for it
_____Has a small value
_____Sounds interesting
_____Will be efficient
_____One of the best ways of doing fundraising
Other (please indicate):

7. Other comments?

APPENDIX F:

Audience Feedback

At the final presentation of this project, there were eight staff members of the WAM. They were:

1. James Welu, Director
2. David Sjosten, Deputy Director
3. Deborah McKean, Campaign Director
4. James Sanders, Director of Operations
5. Manllyn Earley, Director of Development
6. Janet Manahan, Assistant to the Director
7. Fran Pedone, Building Services Manager
8. Eric Tapely, WPI Co-op Student.

Measuring the effectiveness of using 3D animations for fundraising purposes is beyond the scope of this project. However, this project requires the feedback of the WAM people. Please help us by answering the following questions:

8. What do you think of the idea of using 3D animations for fundraising purposes?

_____No need for it

_____Has a small value

_____Sounds interesting

_____Will be efficient

———————One of the best ways of doing fundraising

Other (please indicate):

9. Do you think that the WAM's marketing techniques will be more sufficient by using 3D animations to convey the message to these donors? How?

10. Describe the effect of using 3D animations for the current fundraising campaign?

11. What is the best way to measure the effectiveness of using 3D animations for fundraising purposes?

12. Other comments?

APPENDIX G:

Presentation;

Using 3D Animations to Assist Fund Raising at the WAM

Edwin Jacques(CS)

Jarallah Aljarallah(EE)

Rassem Merhi(CE)

Advisor: Professor Salazar, WPI

Project Goals

- Research the usefulness of 3D animations for marketing
- Examine past fund drives at WAM
- Use 3D animations for the WAM to assist fundraising efforts

3D Animation influence on fundraising practices

- **Uses of 3D animation**
- **3D animation as a marketing tool**
- **Using 3D animations for fundraising at the WAM**

Uses of 3D animation

- **Different Uses of 3D animation**
  - **3D animation as a tool for education purposes**
  - **3D animation in the science space**
- **Future uses of 3D animations**

The usefulness of 3D animations for marketing

- **Modern marketing strategies**
- **Consumer Behavior**
- **Promotions**
- **Symbolic communications in promotions**
- **Matching the effectiveness of promotions**

3D Animations usefulness for fundraising at the WAM

- **The current fund raising drive at the WAM**
- **Different applications of our animations**

Implementation: What did we do?

- **Created 3D AutoCAD drawings**
- **Used 3D Studio MAX to complete model**
- **Used 3D Studio MAX to create animation**

The Animation

- **First draft**
- **Layout of each floor is technically accurate**

What can you do with our work?

- **With time & money, it can be made to look like…**
- **Who can do the work? How much would it cost?**

http://dir.yahoo.com/Business_and_Economy/Companies/Architecture/Rendering__Modeling_and_Animation/Computer_Generated/

Possibilities...

- **Animations or renderings of changes to the museum for a web page**
- **Interactive, *Virtual Museum* with VRML for advertising & marketing**

Conclusion

- You get the files for all of our work.
- We hope our work is useful for you.
- Any questions?

THANK YOU!