INTERACCION HUMANO-MAQUINA AVANZADA

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CHAPTER 1: INTRODUCTION

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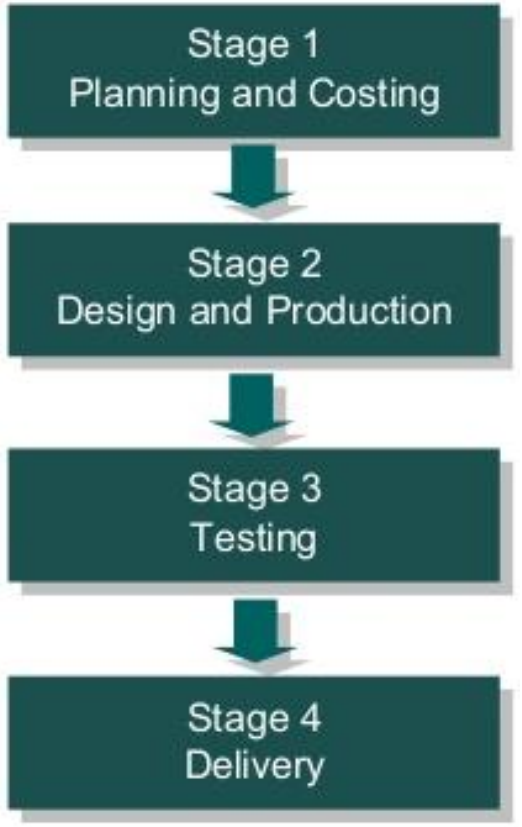
A MULTIMEDIA PROJECT: THE STAGES

- Most multimedia and web projects must be undertaken in stages. Some stages should be completed before other stages begin, and some stages may be skipped or combined. Here are the four basic stages in a multimedia Project:
  - Planning and costing
  - Designing and producing
  - Testing
  - Delivering



PLANNING AND COSTING

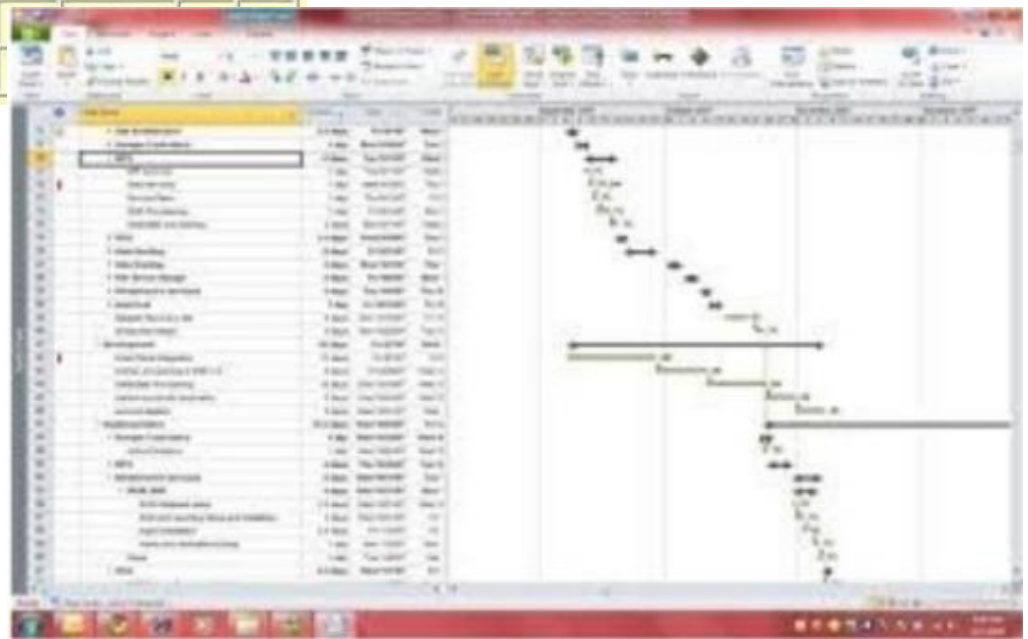
- A project always begins with an idea or a need that you then refine by outlining its messages and objectives.
- Identify how you will make each message and objective work within your authoring system.
- Before you begin developing, plan out the writing skills, graphic art, music, video, and other multimedia expertise that you will require. Develop a creative "**look and feel**" (what a user sees on a screen and how he or she interacts with it), as well as a structure and a navigational system that will allow the viewer to visit the messages and content.

PLANNING AND COSTING

- Estimate the time you'll need to do all the elements, and then prepare a budget. Work up a short **prototype** or **proof-of-concept**, a simple, working example to demonstrate whether or not your idea is feasible.

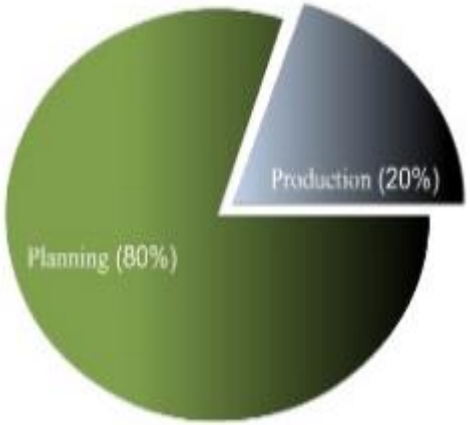
Gantt Chart Format

Task	Duration	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2 mo.												
2	2 mo.												
3	2 mo.												
4	2 mo.												
5	2 mo.												
6	2 mo.												



PLANNING AND COSTING

- The more time you spend getting a handle on your project by defining its content and structure in the beginning, the faster you can later build it, and the less reworking and rearranging will be required midstream.
- Think it through before you start!
- Your creative ideas and trials will grow into screens and buttons (or the look and feel), and your proof-of-concept will help you test whether your ideas will work.
- You may discover that by breaking the rules, you can invent something terrific!



80% planning + 20% production

DESIGNING AND PRODUCING

- Perform each of the planned tasks to create a finished product. During this stage, there may be many feedback cycles with a client until the client is happy.

TESTING

- Test your programs to make sure that they meet the objectives of your project, work properly on the intended delivery platforms, and meet the needs of your client or end user.

DELIVERING

- Package and deliver the project to the end user. Be prepared to follow up over time with tweaks, repairs, and upgrades.

WHAT YOU NEED

- You need hardware, software, and good ideas to make multimedia. To make *good* multimedia, you need talent and skill.
- You also need to stay organized, because as the construction work gets under way, all the little bits and pieces of multimedia content will get lost under growing piles of paper, CDs, videotapes, phone messages, permissions and releases, cookie crumbs, Xerox copies, and yesterday's mail.
- Even in serious offices, where people sweep all flat surfaces clear of paperwork and rubber bands at five o'clock, there will be a mess

WHAT YOU NEED

- You will need time and money for consumable resources (i.e CD-R blanks and other memory or digital storage, for telephoning and postage, and possibly for paying for special services and time), and you will need to budget these resources.
- You may also need the help of other people.
- Multimedia development of any scale greater than the most basic level is inherently a team effort:
  - artwork is performed by graphic artists, video shoots by video producers, sound editing by audio producers, and programming by programmers.

CREATIVITY

- Before beginning a multimedia project, you must first develop a sense of its scope and content.
- Let the project take shape in your head as you think through the various methods available to get your message across to your viewers.
- The most precious asset you can bring to the multimedia workshop is your creativity.
- It is very difficult to learn creativity. Some people might say it's impossible—and that you have to be born with it. But, like traditional artists who work in paint, marble, or bronze, the better you know your medium, the better able you are to express your creativity.

ORGANIZATION

- It’s essential that you develop an organized outline and a plan that rationally details the skills, time, budget, tools, and resources you will need for a project.
- These should be in place before you start to render graphics, sounds, and other components, and a protocol should be established for naming the files so you can organize them for quick retrieval when you need them.

COMMUNICATION

- Many multimedia applications are developed in workgroups comprising instructional designers, writers, graphic artists, programmers, and musicians located in the same office space or building. The workgroup members' computers are typically connected on a local area network (LAN). The client's computers, however, may be thousands of miles distant, requiring other methods for good communication.
- Communication among workgroup members and with the client is essential to the efficient and accurate completion of your project. If your client and you are both connected to the Internet, a combination of Skype video and voice telephone, e-mail, and the **File Transfer Protocol (FTP)** may be the most cost-effective and efficient solution for both creative development and project management.

HARDWARE

- There are two most significant platforms for producing and delivering multimedia projects: the **Apple Macintosh operating system** (OS) and the **Microsoft Windows** OS, found running on most Intel-based PCs (including Intel-based Macintoshes).
- Regardless of the delivery vehicle for your multimedia—whether it's destined to play on a computer, on a Wii, Xbox, or PlayStation game box, or as bits moving down the data highway—most multimedia will probably be made on a Macintosh or on a PC.

HARDWARE

- While there is a lot of talk about **platform-independent** delivery of multimedia on the Internet, with every new version of a browser there are still annoying failures on both platforms. These failures in **cross-platform** compatibility can consume great amounts of time as you prepare for delivery by testing and developing workarounds and tweaks so your project performs properly in various target environments.
- Selection of the proper platform for developing your multimedia project may be based on your personal preference of computer, your budget constraints, project delivery requirements, and the type of material and content in the project.

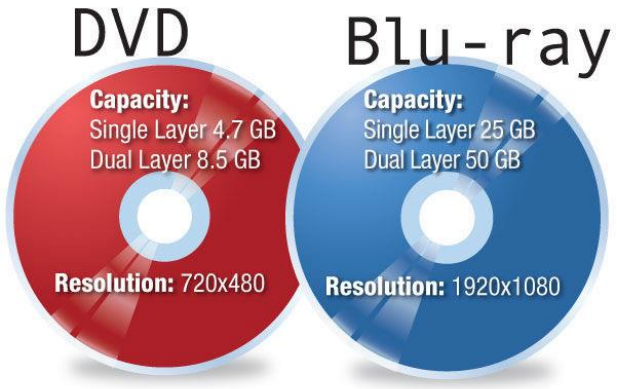
CONNECTIONS

- The equipment required for developing your multimedia project will depend on the content of the project as well as its design.
- You will certainly need as fast a computer as you can lay your hands on, with lots of RAM and disk storage space.

Connection	Transfer Rate
Serial port	115 Kbps (0.115 Mbps)
Standard parallel port	115 Kbps (0.115 Mbps)
USB (Original 1.0)	12 Mbps (1.5 Mbps)
SCSI-2 (Fast SCSI)	80 Mbps
SCSI (Wide SCSI)	160 Mbps
Ultra2 SCSI	320 Mbps
FireWire 400 (IEEE 1394)	400 Mbps
USB (Hi-Speed 2.0)	480 Mbps
SCSI (Wide Ultra2)	640 Mbps
FireWire 800 (IEEE 1394)	800 Mbps
SCSI (Wide Ultra3)	1,280 Mbps
SATA 150	1,500 Mbps
SCSI (Ultra4)	2,560 Mbps
SATA 300	3,000 Mbps
FireWire 3200 (IEEE 1394)	3,144 Mbps
USB (Super-Speed 3.0)	3,200 Mbps
SCSI (Ultra5)	5,120 Mbps
SATA 600	6,000 Mbps
Fibre Channel (Optic)	10,520 Mbps

DVD AND BLU-RAY

- DVD and Blu-ray Specifications



DVD Feature	DVD Specification	Blu-ray Specification
Disc diameter	120 mm (5 inches)	120 mm (5 inches)
Disc thickness	1.2 mm (0.6 mm thick disc × 2)	1.2 mm (0.6 mm thick disc × 2)
Memory capacity	4.7 gigabytes/single side	25 gigabytes/single layer
Wave length of laser diode	650 nanometer/635 nanometer (red)	405 nanometer (blue-violet)
Data transfer rate 1x	Variable speed data transfer at an average rate of 4.69 Mbps for image and sound	Variable speed data transfer at an average rate of 36 Mbps for image and sound
Image compression	MPEG2 digital image compression	MPEG-2 Part 2, H.264/MPEG-4 AVC, and SMPTE VC-1
Audio	Dolby AC-3 (5.1 ch), LPCM for NTSC and MPEG Audio, LPCM for PAL/SECAM (a maximum of 8 audio channels and 32 subtitle channels can be stored)	Dolby Digital (AC-3), DTS, and linear PCM
Running time (movies)	Single Layer (4.7GB): 133 minutes a side (at an average data rate of 4.69 Mbps for image and sound, including three audio channels and four subtitle channels)	Single Layer (25GB): Encoded using MPEG-2 video, about two hours of HD content; using VC-1 or MPEG-4 AVC codecs, about 4 hours of HD quality video and audio

INPUT DEVICES

- A great variety of input devices—from the familiar keyboard and handy mouse to touchscreens and voice recognition setups—can be used for the development and delivery of a multimedia project.
- If you are designing your project for a public kiosk, use a touchscreen. If your project is for a lecturing professor who likes to wander about the classroom, use a remote handheld mouse.
- If you create a great deal of original computer-rendered art, consider a pressure-sensitive stylus and a drawing tablet.

INPUT DEVICES

- Scanners enable you to use **optical character recognition (OCR)** software. With OCR software and a scanner, you can convert paper documents into a word processing document on your computer without retyping or rekeying.
- For hands-free interaction with your project, try **voice recognition systems**. These behavioral biometric systems usually provide a unidirectional cardioid, noise-canceling microphone that automatically filters out background noise and learns to recognize voiceprints.
- Most voice recognition systems currently available can trigger common menu events such as Save, Open, Quit, and Print, and you can teach the system to recognize other commands that are more specific to your application.

OUTPUT DEVICES

- Presentation of the audio and visual components of your multimedia project requires hardware that may or may not be included with the computer itself, such as speakers, amplifiers, projectors, and motion video devices. It goes without saying that the better the equipment is, of course, the better the presentation.
- The monitor you need for development of multimedia projects depends on the type of multimedia application you are creating, as well as what computer you're using.

SOFTWARE

- Multimedia software tells the hardware what to do.
- The basic tool set for building multimedia projects contains one or more authoring systems and various editing applications for text, images, sounds, and motion video. A few additional applications are also useful for capturing images from the screen, translating file formats, and moving files among computers when you are part of a team—these are tools for the housekeeping tasks that make your creative and production life easier.

SOFTWARE

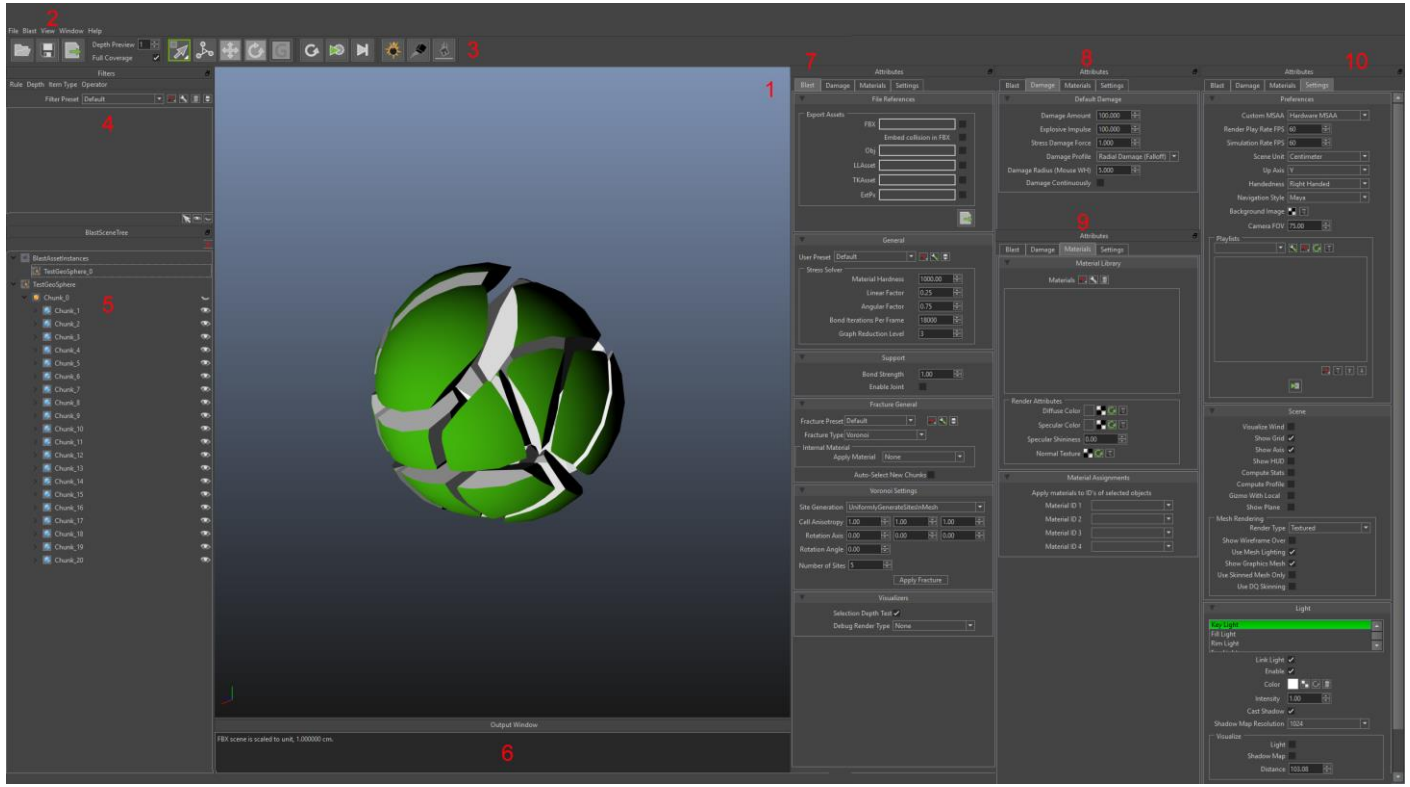
- Serveral types of software are required:
- Text Editing and Word Processing Tools
- OCR Software
- Painting and Drawing Tools
- 3-D Modeling and Animation Tools
- Image-Editing Tools
- Sounf-Editing Tools
- Animation, Video, and Digital Movie Tools

AUTHORING SYSTEMS

- Multimedia authoring tools provide the important framework you need for organizing and editing the elements of your multimedia project, including graphics, sounds, animations, and video clips.
- Authoring tools are used for designing interactivity and the user interface, for presenting your project on screen, and for assembling diverse multimedia elements into a single, cohesive product.

AUTHORING SYSTEMS

- Authoring software provides an integrated environment for binding together the content and functions of your project, and typically includes everything you need to create, edit, and import specific types of data; assemble raw data into a playback sequence or cue sheet; and provide a structured method or language for responding to user input.



AUTHORING SYSTEMS

- With multimedia authoring software, you can make
  - Video productions
  - Animations
  - Games
  - Interactive web sites
  - Demo disks and guided tours
  - Presentations
  - Kiosk applications
  - Interactive training
  - Simulations, prototypes, and technical visualizations

TYPES OF AUTHORING TOOLS

- Each multimedia project you undertake will have its own underlying structure and purpose and will require different features and functions.
- The various multimedia authoring tools can be categorized into three groups, based on the method used for sequencing or organizing multimedia elements and events:
  - Card- or page-based tools
  - Icon-based, event-driven multimedia and game-authoring tools
  - Time-based tools

TYPES OF AUTHORING TOOLS

- **Card-based** or **page-based** tools are authoring systems, wherein the elements are organized as pages of a book or a stack of cards. Thousands of pages or cards may be available in the book or stack. These tools are best used when the bulk of your content consists of elements that can be viewed individually, letting the authoring system link these pages or cards into organized sequences. You can jump, on command, to any page you wish in the structured navigation pattern.
- Card- and page-based systems typically provide two separate layers on each card: a **background layer** that can be shared among many cards, and a foreground layer that is specific to a single card.

TYPES OF AUTHORING TOOLS

- **Icon- or object-based**, **event-driven** tools are authoring systems, wherein multimedia elements and interaction cues (events) are organized as objects in a structural framework or process. Icon- or object-based, event-driven tools simplify the organization of your project and typically display flow diagrams of activities along branching paths. In complicated navigational structures, this charting is particularly useful during development.

TYPES OF AUTHORING TOOLS

- Icon-based, event-driven tools provide a visual programming approach to organizing and presenting multimedia.
- First you build a structure or flowchart of events, tasks, and decisions, by dragging appropriate icons from a library. These icons can include menu choices, graphic images, sounds, and computations. The flowchart graphically depicts the project's logic. When the structure is built, you can add your content: text, graphics, animation, sounds, and video movies.
- Then, to refine your project, you edit your logical structure by rearranging and fine-tuning the icons and their properties.

TYPES OF AUTHORING TOOLS

- **Time-based tools** are authoring systems, wherein elements and events are organized along a timeline, with resolutions as high as or higher than 1/30 second.
- Time-based tools are best to use when you have a message with a beginning and an end. Sequentially organized graphic frames are played back at a speed that you can set. Other elements (such as audio events) are triggered at a given time or location in the sequence of events.
- The more powerful time-based tools let you program jumps to any location in a sequence, thereby adding navigation and interactive control.

CHOOSING AN AUTHORING TOOL

- In the best case, you must be prepared to choose the tool that best fits the job; in the worst case, you must know which tools will at least "get the job done.
- It is important that you study the software product reviews in the blogs and computer trade journals, as well as talk with current users of these systems, before deciding on the best ones for your needs.

CHOOSING AN AUTHORING TOOL

- Some factors to consider in the selection of an authoring tool are:
  - Editing Features: editing text, audio, video, images.
  - Organizing Features: by means of storyboarding or flowcharting.
  - Programming Features:
    - Visual programming with cues, icons, and objects
    - Programming with a scripting language
    - Programming with traditional languages, such as Basic or C
    - Document development tools
  - Interactivity Features: simple branching, conditional branching, complex programming logic.
  - Performance Tuning Features: synchronization of events
  - Playback Features
  - Delivery Features: run-time version or standalone versión
  - Cross-Platform
  - Internet Playability

Activity in class

- You have been assigned to develop a complex multimedia kiosk for an auto club that will allow users with an account to enter a start point and an ending point, and have a map printed out.
  - What input devices could be used to identify the user?
  - What input devices could be used to enter start and end locations?
  - Could one device do both functions?
  - What about printing out the maps?