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22MCA423

Fourth Semester MCA Degree Examination, June/July 2024
Fundamentals of Game Design

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

			M	L	C
		Module – 1			
Q.1	a.	What do you mean by serious games? Explain different kind of serious games.	10	L1	CO1
	b.	Explain the stages of design process.	10	L2	CO2
		OR			
Q.2	a.	Compare and contrast between conventional games and video games.	10	L1	CO1
	b.	Describe the anatomy of a game designer.	10	L2	CO2
		Module – 2			
Q.3	a.	Define Genre. Explain Role – playing games. Action and Arcade games.	10	L2	CO3
	b.	Describe the dangers of binary thinking.	10	L2	CO3
		OR			
Q.4	a.	Explain Vanden Berghe's five domains of play.	10	L2	CO3
	b.	What is sub Genre? Explain Adventure and Puzzle games.	10	L2	CO3
		Module – 3			
Q.5	a.	Discuss the different direct payment models for video games.	10	L2	CO2
	b.	Depict the need of these devices for video games : i) Portable devices ii) Personal computers.	10	L2	CO3
		OR			
Q.6	a.	Discuss the different indirect payment models for video games.	10	L2	CO2
	b.	Compare and contrast between stand alone games and browser based games.	10	L2	CO3
		Module – 4			
Q.7	a.	What is self defining play? Explain the forms of personality expression.	10	L1	CO4
	b.	Depict the relationship between player and avatar.	10	L1	CO4
		OR			
Q.8	a.	Explain constrained and free form creative play.	10	L1	CO4
	b.	What is temporal dimension? Explain variable time and anomalous time.	10	L2	CO4
		Module – 5			
Q.9	a.	Explain the need of storytelling engine in game with a diagram depicting relationship with core mechanics.	10	L2	CO2
	b.	Differentiate between linear and non linear stories.	10	L3	CO2
		OR			
Q.10	a.	How do you perform character dimensionality for defining characters of video game?	10	L1	CO4
	b.	What do you mean by interactive stories? What are the different kinds of events in interactive story?	10	L1	CO2

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1. **What do you mean by Serious games? Explain different kinds of Serious games.**

Serious games are games that solve real-world problems. They are not designed purely for entertainment but to accomplish something meaningful in the real world. The best of them are entertaining, however, because they achieve their goals by means of enjoyable play. There are many kinds of serious games, and this book has room to discuss them only briefly.

Education and Training The oldest form of serious game is the educational game. Educational gaming has advanced considerably since its beginnings, as designers have found ways to inspire players to learn, or to teach them things without their even being aware that they are being taught—a trick called stealth learning. Educational games are not confined to children. Many vocations require training and use games as a teaching tool. For example, games can be used to train para-medics, hazardous materials response teams, and military personnel. I have consulted on the design of a game that trains laparoscopic surgeons to improve their motor skills

Simulation and Study Many games (such as flight and driving simulators) reproduce a real process of some kind, so the boundary between games and simulations is indistinct. Generally speaking, a pure simulation makes no concessions to entertainment at all and tries to be as accurate as possible within the limitations of its hardware. Serious games for the purpose of simulation try to retain the accuracy but to incorporate more game-like qualities to provide player feedback and engagement. For example, the online puzzle game Foldit lets players search for proteins with shapes that can be useful in chemistry and medicine.

Persuasive Games Some people use games to convey a particular message or point of view, either to advertise a product or to promote a political or charitable cause. The web-based Virtual Pilot game by Lufthansa airline tests the players' knowledge of the names and locations of European cities... but it includes only the cities that Lufthansa flies to, so it subtly promotes awareness of their route map. If a game conveys its message primarily through its mechanics rather than through explicit narration, we say that is uses procedural rhetoric.

Games for Health and Growth It's now well known that mental exercise helps to prevent loss of brain function as humans age, and this accounts for the popularity of brain-training games. But games can be used in many other aspects of health care and personal growth as well. Wii Fit has become popular in care homes for the elderly and as a way of making physical therapy less boring. Games can also reduce the need for morphine during painful procedures by distracting the patient. The University of Washington's Medical Center created a game called Snow World, which—with the addition of virtual reality gear—helps people undergoing burn treatment.

1.b. Explain the stages of Design phases.

• The concept stage, which you perform first and whose results do not change

• The elaboration stage, in which you add most of the design details and refine your

decisions through prototyping and playtesting

• The tuning stage, at which point no new features may be added, but you can make small

adjustments to polish the game.

The Concept Stage:

• It establishes things about the game that are so fundamental, changing them later would

wreak havoc on the development process because a great deal of the work done to implement the game would have to be thrown away

Getting a concept: a general idea of how you intend to entertain someone through gameplay and, at a deeper level, why you believe it will be a compelling experience.If your game resembles others that are already on the market, you would normally playtest several to see how they did things and how you can improve on them.

Defining an audience: Once you know what kind of experience you want to present, you have to think about who would enjoy that experience. , in player-centric design, you test every design decision against your hypothetical representative player to be sure that the decision helps to entertain your target audience.

Determining the players role: In a representational game, the player does a lot more pretending. Sometimes the roles in a game are multifaceted

Fulfilling the dream: Representational games are about fulfilling dreams—dreams of achievement, of power, of creation, or simply of doing certain things and having certain experiences.

Once you have a game concept, a role, and an audience in mind, it's time to begin thinking about how you will fulfill your player's dream. What is the essence of the experience that you are going to offer? What kinds of challenges does the player expect to face, and what kinds of actions does she expect to perform? Deciding what it means to fulfill the dream is the first step on the road to defining the gameplay itself.

The Elaboration Stage:

In the elaboration stage, you normally begin working with a small development team to construct a prototype of the game. If you are planning to incorporate radically new ideas or new technology, your team may also build a test bed or technical demonstration to try them out.

Prototyping:

Prototyping A prototype is a simplified, but testable, version of your game. Designers make prototypes to try out game features before they spend the time and money to implement them in the actual game; they also use them for play-testing with their audience to see if the game is enjoyable.

To build a software prototype, you create software that isn't as complete as your full game in order to try out some aspect of it. Tools such as Game Maker can make this much easier than doing it from scratch.

• **Defining the primary gameplay mode:**

The first task after deciding your concept is to define the primary gameplay mode of the game, the mode in which the player spends the majority of his time. Most games have one gameplay mode that is clearly the primary one. In a car racing game, it's driving the car. Tuning up the car in the shop is a secondary mode. In war games, the primary gameplay mode is usually tactical—fighting battles. War games often have a strategic mode as well, in which the player plans battles or chooses areas to conquer on a map, but he generally spends much less time doing that than he does fighting.

• **Designing the protagonist**: If your game is to have a single main character who is the protagonist (whether or not the interaction model is avatar-based), it is essential that you design this character early on. You want the player to like and to identify with the protagonist, to care about what happens to her.

• **Defining the game world:** The game world is where your game takes place, and defining it can be an enormous task. There are many dimensions to a game world: physical, temporal, environmental, emotional, and ethical. All these qualities exist to serve and support the gameplay of your game, but they also entertain in their own right.

• **Designing the core mechanics:** If we have a sense of the kinds of challenges and actions that need to be included in the primary gameplay mode, you can begin thinking about how the core mechanics create those challenges and implement the actions.

• **Creating additional modes:** As we decide upon our game concept, you may realize that you need more than one gameplay mode. in the elaboration stage, design the additional modes: their perspective, interaction model, and gameplay. You must also document what causes your game to move from mode to mode—the structure of your game

• **Designing levels:** Level design is the process of constructing the experience that the game offers directly to the player, using the components provided by the game design: the characters, challenges, actions, game world, core mechanics, and storyline if there is one. Creating a working playable level is an important milestone in the development of a game because it means that testers can begin play-testing it

• **Writing the story:** A story may be integrated with the gameplay in a number of different ways. The story may be embedded, with prewritten narrative chunks, or emergent, arising out of the core mechanics. It may be linear and independent of the player's actions, or it may go in different directions based on the player's choices.

• **Build, test and iterate** Video games must be prototyped before they can be built for real, and they must be tested at every step along the way. Each new idea must be constructed and tried out, preferably in a quick-and-dirty fashion first, before it is incorporated into the completed product.

The Tuning Stage:

• Feature lock-No more features can be added.

• The features are defined and executed in elaboration stage. In tuning stage we can add some changes to the features.

2.a. Compare and Contrast between Conventional games and video games.

Conventional games must have a thorough understanding of the essential elements play, rules, goals, and so on and should be able to design an enjoyable game with nothing but paper and pencil. Video games are a subset of the universe of all games. A video game is a game mediated by a computer, whether the computer is installed in a tiny keychain device such as a Tamagotchi or in a huge electronic play environment at a theme park

Hiding the Rules Unlike conventional games, video games ordinarily do not require written rules. The game still has rules, but the machine implements and enforces them for the players.

Setting the Pace In conventional games that don't use a timer, either the players or an independent referee sets the pace of the game—the rate at which the events required by the rules take place. In effect, it is up to the players to make the game go. In video games, the computer sets the pace and makes the game go. Unless specifically waiting for the player's input, the computer keeps the game moving forward at whatever pace the designer has set.

Presenting a Game World The players can think of themselves as make-believe characters in a make-believe place. With conventional games, this takes place primarily in the player's imagination, although printed boards, cards, and so on can help. Video games can go much further. By using a screen and speakers, video games present a fictional world the players can sense directly. Modern video games are full of pictures, animation, movies, music, dialog, sound effects, and so on that conventional games cannot possibly provide.

Creating Artificial Intelligence AI brings considerably more to video gaming than artificial opponents for traditional games. Game developers use AI techniques for the following: strategy, pathfinding, natural language parsing, natural language generation.

2.b. Describe the anatomy of a game designer

Imagination

A game exists in an artificial universe, a make-believe place governed by make-believe rules. Imagination is essential to creating this place. It comes in various forms:

Visual and auditory imagination enables you to think of new buildings, trees, animals, creatures, clothing, and people—how they look and sound.

Dramatic imagination is required for the development of good characters, plots, scenes, motivations, emotions, climaxes, and conclusions.

Conceptual imagination is about relationships between ideas, their interactions, and dependencies.

Lateral thinking is the process of looking for alternative answers, taking an unexpected route to solve a problem.

Deduction is the process of reasoning from a creative decision you've made to its possible consequences. Deduction isn't ordinarily thought of as imagination, but the conclusions you arrive at produce new material for your game.

Technical Awareness:

Technical awareness is a general understanding of how computer programs, particularly

games, actually work.

Level designers, in particular, often need to be able to program in simple scripting languages.You must also be aware of its limitations so that you don't create unworkable designs.

Analytical Competence:

Analytical competence is the ability to study and dissect something: an idea, a problem, or an entire game design. No design is perfect from the start; game design is a process of iterative refinement. Consequently, you must be able to recognize the good and bad parts of a design for what they are.

Mathematical Competence: Designers must have basic math skills, including trigonometry and the simpler principles of probability. Balancing games that feature complex internal economies, such as business simulations or real-time strategy games, can require you to spend a lot of time looking at numbers.

Aesthetic Competence:

Although you need not be an artist, you should have a general aesthetic competence and some sense of style. Far too many games are visual clones of one another, depending on stereotypes and clichés rather than real imagination. It's up to you (along with your lead artist) to set the visual tone of the game and to create a consistent, harmonious look

General Knowledge and the Ability to Research:

The most imaginative game designers are those who have been broadly educated and are interested in a wide variety of things. It helps to be well versed in such topics as history, literature, art, science, and political affairs.

Writing Skills

A professional game designer actually spends most of his time writing, so a designer must have good writing skills.This means being clear, concise, accurate, and unambiguous.

Technical writing is the process of documenting the design in preparation for development.

Fiction writing (narrative) creates the story of the game as a whole—a critical part of the design process if the game has a strong storyline.

Dialog writing (drama) is needed for audio voiceovers and cinematic material. Dialog conveys character, and it also can form part of the plot.

Drawing Skills

The vast majority of computer games rely heavily on visual content, and drawings are essential when you're pitching a product to a third party.

The Ability to Synthesize:

Synthesis, in this context, means bringing together different ideas and constructing something new from them.

First, you must allow your team some ownership of the vision as well, or its members won't

have any motivation or enthusiasm for the project.

Second, a designer who can't deliver in a team environment, no matter how visionary she may be, doesn't stay employed for long. You must be able to work successfully with other people.

3.a. Define Genre? Explain Role-playing games, Action and Arcade games.

Agenre is a category of games characterized by a particular set of challenges, regardless of setting or game-world content.

Role-Playing Games:

• Role-playing games involve tactical, logistical, and exploration challenges.

• They also include economic challenges because the games usually involve collecting loot and trading it in for better weapons.

• They sometimes include puzzles and conceptual challenges, but rarely physical ones.

• Real-world simulations include sports games and vehicle simulations, including military vehicles.

• They involve mostly physical and tactical challenges but not exploration, economic, or conceptual ones.

Action and Arcade Games:

• Action games include physical challenges.

• They may also incorporate puzzles, races, and a variety of conflict challenges, typically among a small number of characters.

• Action games often contain simple economic challenges as well, usually involving collecting objects

• They include strategic or conceptual challenges.

• Action games may be further subdivided into a variety of sub-genres.

• Two of the best known are shooter games and fighting games.

3.b. Explain the dangers of Binary Thinking.

We can't make a game for everyone, so your target audience is necessarily a subset of all possible players, a subset determined by your answers to the questions "Who will enjoy this game?" and "What kinds of challenges do they like?" This is binary thinking: We assume that if group A likes a thing, everyone outside that group won't like it. It's unsound reasoning and may actually cause you to lose part of your potential customer base **Reasoning Statistically about Player Groups** Suppose you ask a group of players to rate their level of interest in a particular game on a scale of 0 to 10, with 0 representing no interest at all and 10 being fanatical enthusiasm. A few people will be at the extremes and the majority somewhere in the middle. If you graph the responses of men and women separately, you may find for a given game that the two groups have different arithmetic means; that is, the centers of their bell-shaped curves fall at different places on the graph.

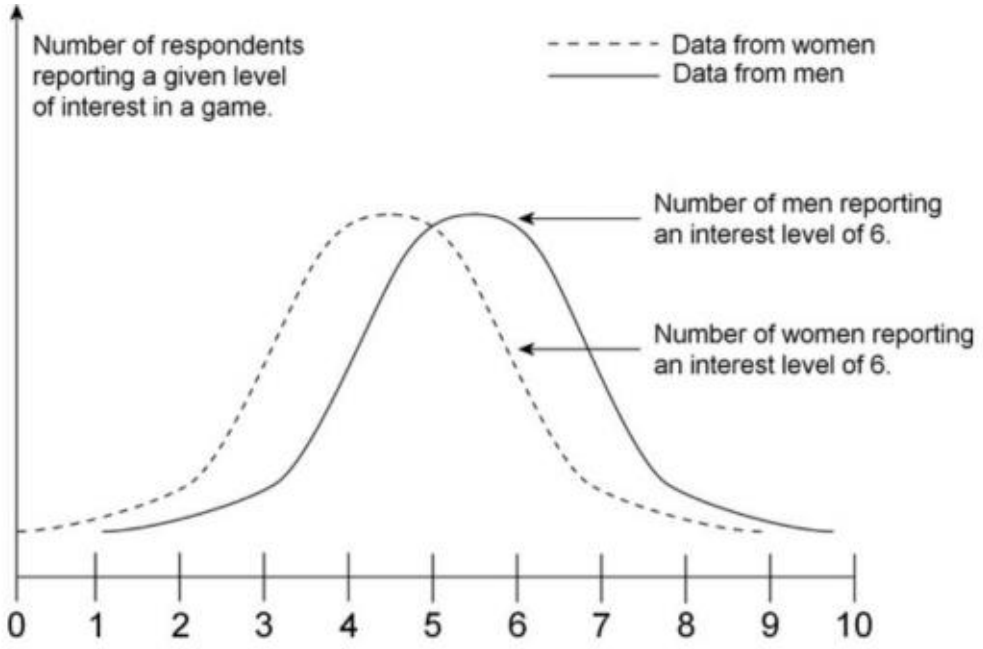

Figure 4.3 Reported level of interest in a game on a 0–10 scale

Men have a higher level of interest in this game than women do," in fact, a large area of overlap indicates that a significant portion of the women surveyed are interested in the game as well. Furthermore, the number of women reporting an interest level of 6 is about two-thirds that of the number of men reporting the same interest level. two-fifths of all the people reporting an interest level of 6 are women—far too many to simply ignore

Strive for Inclusiveness, Not Universality We cannot make a game that appeals to everyone by throwing in a hodgepodge of features because group A likes some of them and group B

likes others. If you do, you will produce a game that has too many features and no harmony. For instance, you can't make a game that appeals to action fans, to strategy fans, and to fans of management simulations by combining kung fu, chess, and Monopoly—the result would be a mess that appeals to none of them. On the other hand, you can include a story line in a fighting game so long as the story line doesn't interfere with the gameplay. The story line adds depth to the game without driving away its key market of fighting-game enthusiasts, and it might attract the interest of people who otherwise wouldn't pay any attention to a fighting game. Heavenly Sword and God of War are good examples.

4.a. Explain Vanden Berghe's five domains of play.

VandenBerghe's work is based on a well-known psychological model of human personality traits called the Five Factor Model. also known as "The Big Five," explains personality traits in terms of five non overlapping domains:

Openness to new experiences

Conscientiousness

Extraversion

Agreeableness and

Neuroticism

Novelty:

• Players who seek novelty like games that include a lot of variety and unexpected elements.

• People who don't like novelty seek familiarity instead: games that offer them a comforting sameness.

• These players might prefer Words with Friends to a science fiction extravaganza set in a strange world with strange rules

Challenge:

• VandenBerghe correlates a desire for challenge—and perhaps more specifically effort and control—with the trait of conscientiousness.

• High-challenge players prefer games that are difficult and require precision to win.

• Their conscientiousness drives them to act, to accomplish things, and perhaps to try to complete everything in a game.

• Low-challenge players like sandbox games and others in which the player is free to fool around without being required to achieve something.

Stimulation:

• Particularly via social engagement, this naturally correlates with extraversion.

• These players enjoy party games and others that involve interacting with other players.

• Those who prefer to avoid stimulation prefer games they can play alone, games that let them be the only real person in the game world.

Harmony:

• the feeling that all parts of the game belong to a single, coherent whole.

• VandenBerghe is referring to social harmony and correlates this motivation with the personality trait of agreeableness.

Threat:

• This domain is the most peculiar one because players' reactions to it are the opposite of what you might expect.

• The game quality of threat (an element of danger, or frightening content—anything that is likely to generate unpleasant emotions) is popular with people who have high neuroticism scores in OCEAN tests.

4.b. What is Sub Genre? Explain Adventure and Puzzle Games.

Adventure Genres:

• Adventure games chiefly provide exploration and puzzle-solving.

• They sometimes contain conceptual challenges as well.

• Adventure games may include a physical challenge also, but only rarely.

Puzzle Games:

Puzzle games offer logic challenges and conceptual challenges almost exclusively, although occasionally there's time pressure or an action element.

5.a. Discuss the different direct payment models for video games.

The direct payment model, in which players simply purchase a game, either as a whole or over time, is the oldest.

• With retail sales or digital distribution, players simply buy your game outright.

Three other approaches are

• subscription-based sales (players subscribe to your game as a service rather than buying it as a product),

• episodic delivery (players buy episodes of your game as they become available)

• crowdfunding (players pay for your game in advance as a way of funding its development).

Retail Sales:

• The traditional distribution and sales model for video games is the retail model

• it is in decline for PC games, it remains strong for console games. It's not used for mobile phone games at all, although it is for dedicated handhelds

• People prefer this method to gift for Occasions and festivals like Christmas.

This model works well for large studios making large games, but not for small independents because they have limited access to shelf space and marketing.

• The key drawback to retail sales is that you must have a publisher or distributor to get your game onto the store shelves.

• Normally a publisher will either develop a game in-house or will contract with a development studio to develop it for them.

• The marketing for retail games can easily cost three to ten times as much as the development costs.

• Many games don't turn a profit, so the hit games subsidize the others

• Publishers almost never accept submissions from people they've never heard of; even more important to them than the quality of the game idea is the reliability of the developer

• If it's a console or dedicated handheld game, the hardware company (Nintendo, Sony, and so on) does the manufacturing at a large price per disk or cartridge, which is how those companies make most of their money. If it's a PC game, the manufacturing is fairly inexpensive.

• In the retail sales model, the publisher sells the game at wholesale to the retailer.

• If a publisher is financing your company to build a game for them, even if the game was originally your idea, you can expect them to want a lot of input into its design.

Digital Distribution:

• Distributing games electronically over the Internet gets rid of inventory risk and cuts out the retailers, which offers game developers (and publishers, if there is a publisher) far more freedom and flexibility.

• No retailer

• For example, if you sell a game on Steam, the Apple App Store, or Xbox Live Marketplace, those organizations will take a certain amount per copy sold.

• 30% for hosting and 70% for development

• First Disadvantage , if there is no publisher, you have to market the game yourself, and as we have already seen, the marketing can be extremely expensive.

• The second disadvantage is that the prices are far lower

Subscriptions:

• In the subscription model, players pay you a fee, usually monthly, for access to games that you provide via your own servers.

• But replaced by indirect payment methods.

• Subscription models obviously make sense only if you are selling access to game content that changes periodically, or to a game that works more as an ongoing service than as a single entertainment experience (such as an adventure game).

• Subscription-based games need access to a server to be played.

• The subscription model actively discourages some players, who don't like the idea of having to continue to pay again and again to play a game

Episodic Delivery:

Many developers have expressed an interest in trying to find a way to deliver game software in episodes, like a television show.

• Instead of paying every month as with a subscription, customers pay for each new episode as it becomes available

• Majestic, Kentucky Route Zero, and The Walking Dead are all episodic games

• Episodic games are not the same as sequels in a franchise

• Episodic games, by contrast, are really one big game distributed in pieces over time (although they sometimes include technology updates as well).

• As you make and release only one episode at a time, the game gets quickly to market and you can benefit from consumer feedback about one episode before you begin the next one

• Episodic delivery allows you to charge the player a smaller price per episode than a full online sale would cost, which makes the game more attractive to players

• If the game is entertaining enough, this builds customer loyalty and encourages them to continue buying episodes, which means they can end up spending more than they ordinarily would on a single sale

• The disadvantages of episodic delivery are that you still have to have all the core mechanics and user interface (UI) software written prior to delivering the first episode, which can be expensive.

• As a designer, delivering your game episodically means that it must be designed to be episodic in the first place.

• This works well for games with stories, but less well for games that cannot easily be broken up into episodes, such as sandbox games or sports games.

Crowdfunding:

• You don’t necessarily have to wait until your game is finished to get money for it; you can fund its development by asking people to pay you in advance, a process called crowdfunding

• Kickstarter and Indiegogo are the two best-known examples.

• The Double Fine studio asked for $400,000 and got $3,336,371 for a new game, which caused game developers to take this model seriously for the first time

• You will need to create high-quality videos of your work and to give regular updates to your funders.

• It works best for people who already have a positive reputation in the industry.

•Most crowdfunding is not a form of investment, but simply a form of pre-ordering: Players get a copy of the game once it comes out, along with extras if they pay more.

• Naturally, your game must sound exciting to your potential donors, but you are free of pressures from publishers and retailers because you deliver the game directly to the people who gave you money.

•This model is particularly popular with developers with niche market projects who don’t necessarily want to reach the widest population possible, but to target dedicated fans.

5.b. Depict the need of these devices for video games.

i)Portable ii)Personal

Personal Computers Personal computers appeared in the marketplace shortly after home game consoles. They were immediately successful as gaming platforms, and the Commodore 64, Atari ST, Amiga, and other personal computers were wildly popular among gamers and early computer hobbyists

Typical Use: A personal computer (PC) can be set up away from the communal living space, on a computer desk. In this , the player has a keyboard, a mouse, possibly a joystick, and (more rarely) a dedicated game controller such as those on console machines. The player sits 12 to 18 inches away from a relatively small (compared to the television) high-resolution display. The high resolution means that the game can have subtle, detailed graphics. The mouse allows precision pointing and a more complex user interface. The keyboard enables the player to enter text conveniently and send messages to other players over a network, something that is nearly impossible with console machines.

Input Devices: The keyboard and mouse are unique to the PC and laptop experience. With its 101 keys, the keyboard allows user interfaces to employ many, many buttons, and complex computer role-playing games (RPGs). The keyboard enables the player to enter text conveniently and send chat messages to other players over a network, something that is much less convenient with console machines.

Business Considerations The great advantage of PC development is that anyone can program one; you don’t have to get a license from the manufacturer or buy an expensive

development station. Consequently, personal computers are at the cutting edge of innovation in computer gaming. They're the platform of choice for interactive art and other experimental forms of interactive entertainment. Mobile devices are similarly easy and inexpensive to develop for, but they haven't achieved the same level of acceptance as platforms for artistic expression that PCs have. The great bane of PC development is that no two machines are alike. PC games may be divided into two general and quite different categories: standalone games, which the player installs on his machine like any other program, and browser-based games that run inside a web browser such as Safari or Internet Explorer.

STAND ALONE GAMES: stand-alone PC games can be the most visually spectacular. If you want to develop for the highest-end gear, you should build stand-alone PC games. That choice usually limits the size of your market to the truly dedicated hobbyist gamer. On the other hand, many stand-alone games are aimed at the middle of the range and do very well. Most edutainment games are stand-alone games because it's easier for a parent to help a young child with a keyboard and mouse than a handheld controller.

BROWSER-BASED GAMES: Browser-based games are a rapidly growing sector of the game market. Because they run in a web browser, they are isolated from the machine's hardware. A browser-based game can run on a Windows PC, Macintosh, or Linux machine with no modifications. This advantage comes at a price, however; browser-based games cannot take full advantage of the machine's capabilities, and this usually includes 3D rendering. Most browser based games—and there are thousands—are 2D games aimed at the casual player. They are often written in Java or Adobe's ActionScript language, which works with Flash Player.

Portable Devices Portable devices are a hugely popular and inexpensive form of entertainment. They began as dedicated handheld devices that could play only a few builtin games (sometimes only one), and were primarily regarded as toys for children. Since then, they have branched out and out, widening their demographics to adults and becoming moderately powerful and flexible computing devices. Their CPUs are slower than their console counterparts but still have enough power to run sophisticated games. The Sony PSP represented a huge jump in the power and display quality of dedicated handheld game machines.

Typical Use A portable device is designed to be carried around and used by one person. Such devices range in size from quite small mobile phones up to tablet computers that can be nearly the size of a laptop. A key distinction among use cases is whether the device will fit into a pocket. Because portable devices are frequently used in public, every game must include a way to turn off the sound, even though the device itself also includes a master volume control. Battery life also affects the typical use of portable devices. Games tend to be CPU- and graphics intensive applications. You cannot expect a player to play for long periods without being able to save the game as you can on other machines, because at any moment he may have to take an incoming phone call or power down the device to save the battery.

Input Devices unlike either consoles or PCs, portable devices frequently include global positioning systems, enabling you to create augmented reality games that are played by moving around in the real world

6.a. Discuss the different indirect payment models for video games.

By allowing them to pay a little at a time, or only for the parts of the game that they want to pay for, we make it easier to attract them to our games. However, most of these models work only with games that are delivered online, either with a continuous or a periodic connection to a server operated by the development company. Freemium Games: • In the freemium (free+premium) model, a business gives away a partially functional version of its software but allows customers to purchase upgrades that render it more useful. • The first products to be widely successful under the freemium model were antivirus suites. • In the case of games, you give away the game but offer premium items for sale within the game (called in-app purchases or IAPs) that make the game more fun or interesting. • This usually takes the form of downloadable content (DLC). • Downloadable content can consist of all kinds of things: extra levels, new clothing for an avatar character, additional game modes, and new objects in the game, such as weapons or powerups. • Dance games often offer additional music as downloadable content, which helps to keep the experience fresh if the players are getting tired of the music that came with the original game. • The chief criticism of the freemium model, from a player's perspective, occurs when the game isn't any fun without buying the premium content • The freemium model affects game design because rather than designing one single experience, you have to design an experience that can be upgraded through purchases— and you have to make sure that these purchases are desirable enough that you can earn a living from your game Free-to-Play: • In free-to-play games, players get a version of the game that is free but is designed to encourage them to pay a subscription or some other kind of fee • A common design allows players to play completely free of charge forever, but advancement in the game is very slow, and players must log off periodically and come back later to continue. Paying a fee removes this limitation. • Another approach puts free players on one set of servers and paying players on another. The servers for paying players are much less crowded, so the player experiences better performance from the game. • Many free-to-play games are designed to offer the player a small amount of advancement in the game at frequent intervals in response to fairly trivial player activities—sometimes this means the player doesn't have to do anything more than click a button to advance, as in Mafia Wars. • The free-to-play model is closely related to the freemium model, and many free-to-play games also include premiums that players can buy Advertising and Sponsorships: • You can earn revenue by selling advertising alongside your game. Advertising that appears beside your game on the player's screen does not intrude too much, and you earn money for each person who sees, or clicks on, one of the ads • This model is normally used for online games and, if successful, can even enable you to give away the game for free and make all the money from the ads. • Example facebook games and yahoo games • Some developers also sell an ad-free version of the same game to players who don't like the advertisements and are willing to pay not to see them. • You can also have advertisements appear within your game; you do this by selling sponsorships to companies that want to have their message in your game world. • If your

game is a standalone game sold at retail or online, the sponsor simply pays you based on the number of copies that you sell; if the game is an online game delivered via a server, they will pay you per view or per click as is done when the advertising appears alongside the game. • Sponsorships are most common in sports games and vehicle simulations that emulate a real-world sport or car race. • The design implications of advertising, and especially of sponsorship, are that your game content must not upset your sponsors Commissioned Games: • which you get paid to build a game for someone else, but you don't get any royalties for sales. • The only money you see is what you get paid to build the game in the first place, which means that you must build your profit margin into the price you charge to do the work. • For charity or government agency

6.b. Compare and contrast between stand alone games and browser based games.

STAND ALONE GAMES: stand-alone PC games can be the most visually spectacular. If you want to develop for the highest-end gear, you should build stand-alone PC games. That choice usually limits the size of your market to the truly dedicated hobbyist gamer. On the other hand, many stand-alone games are aimed at the middle of the range and do very well. Most edutainment games are stand-alone games because it's easier for a parent to help a young child with a keyboard and mouse than a handheld controller. BROWSER-BASED GAMES: Browser-based games are a rapidly growing sector of the game market. Because they run in a web browser, they are isolated from the machine's hardware. A browser-based game can run on a Windows PC, Macintosh, or Linux machine with no modifications. This advantage comes at a price, however; browser-based games cannot take full advantage of the machine's capabilities, and this usually includes 3D rendering. Most browser based games—and there are thousands—are 2D games aimed at the casual player. They are often written in Java or Adobe's ActionScript language, which works with Flash Player.

7.a. What is self defining play? Explain the forms of personality expression.

Self-Defining play let players project their personality into a game. When a player selects a token to represent herself in Monopoly, she chooses an avatar and so engages in an act of self-definition. Many games allow the player to choose an avatar from a number of different ones available and to customize the avatar in various ways. Because the avatar represents the player in the game world, these activities are called self-defining play. Players greatly enjoy defining themselves, choosing an avatar that either resembles them physically (if it's a human character) or that is a fantasy figure with whom they identify. Forms of Personality Expression

Self-defining play gives the player an opportunity to project his personality into the game world, and explore alternate identities, by means other than gameplay choices. It takes several forms:

Avatar selection allows the player to choose from a number of predefined avatars, usually at the beginning of the game. These avatars are most often humanoid characters, but in driving and flying games, they're vehicles. Many driving games start the player with a small selection of cars, motorcycles, or whatever vehicles are involved and make new choices

available as the player's performance improves. You can let the player purchase a new car with winnings earned in previous races, for example. The right to choose a new and more powerful avatar serves as a reward to some players.

Avatar customization allows the player to modify the appearance or abilities of an avatar that the game supplies by modifying its features. In role-playing games (RPGs), this often takes the form of giving the avatar new skills, clothing, weapons, and armor. In driving games, the customizable features may include the paint color of the car and its engine, transmission, tires, and brakes. Customization can occur both at the beginning of the game and through upgrades awarded or purchased as the game goes on. In this way, a player creates a unique character of her own design. Customization can be purely cosmetic or visual, as with the Nintendo Mii characters, or it can include choices about the character's attributes that may have an effect on gameplay. Younger children pay more attention to visuals than to attributes, as they are not yet used to thinking about games as systems. **Avatar construction** gives the player the greatest freedom of all; he can construct his avatar from the ground up, choosing every detail from a set of available options. Usually offered in RPGs, avatar construction allows the player to choose such features as the sex, body type, skin color, and clothing of the avatar, as well as the avatar's strength, intelligence, dexterity, and other functional qualities. The online RPG Lord of the Rings Online offers a particularly extensive avatar construction feature, as does the single-player RPG The Elder Scrolls IV: Oblivion for the PC. Some, such as Second Life and Minecraft, even let the player import his own graphics for avatars or clothing.

7.b. Depict the relationship between player and avatar

The game industry uses the term avatar to refer to a character in a game who serves as a protagonist under the player's control. (The original term is Sanskrit and in the Hindu religion refers to the bodily incarnation of a god.) Most action and action adventure games provide exactly one avatar. Many role-playing games allow the player to manage a party of characters and switch control from one to another, but if winning a role-playing game is contingent upon the survival of a particular member of the party, then that character is effectively the player's avatar (though some games require that more than one character survive). The player usually sees the avatar onscreen more than any other character if the game is presented in the third person. Displaying the avatar requires the largest number of animations, which must also be the smoothest animations, or you risk annoying the player. The avatar's movements must be attractive, not clumsy, unless clumsiness is part of the avatar's character Player-Designed Avatar Characters While most games have an established character as the player's avatar, role-playing games, especially multiplayer online ones, almost always give players considerable freedom to design an avatar to their own specifications. They can choose the ava tar's race, sex, body type, hair, clothing, and other physical attributes, as well as a large number of other details, such as strength and dexterity, that have a direct effect on the way the avatar performs in challenging situations. Specific and Nonspecific Avatars In games in which the player does not get to design or choose an avatar but must use one supplied by the game, the relationship between the player and the avatar varies depending on how completely you, the designer, specified the avatar's appearance and other qualities. The earliest adventure games, which were text-

based, were written as if the player himself inhabited the game world. However, because the game didn't know anything about the player, it couldn't depict him or say much about him. Such avatars were nonspecific—that is, the designer didn't specify anything about them. Myst is an early example of a graphical game with a nonspecific avatar. The nonspecific avatar does not belong entirely to the past, however. Gordon Freeman, the hero of Half-Life, does not speak and is never even seen in the game (although he does appear on the box). The designers did this deliberately; Half-Life, a first-person shooter in a world with no mirrors, offers Gordon as an empty shell for the player to inhabit. The Effects of Different Control Mechanisms The way a player feels about an avatar depends somewhat on how the player con trols the avatar in the game. In the case of Nancy Drew and the avatars in all other point-and-click adventure and computer role-playing games, the player's control is indirect; he doesn't steer the avatar around but points to where he wants the avatar to go, and the avatar walks there of her own accord. Male and Female Players and Characters Early in the history of video games, some designers were concerned that male players (who used to make up the majority of the market) would be unwilling to play female avatars: Men might find identifying with a female character somehow threatening. Lara Croft demonstrated that this is not a problem, at least as long as the character is acting in a role that men are comfortable with. Lara engages in tradition ally masculine activities, so men are happy to enter the game as Lara. They might be less comfortable with an avatar who engaged in more traditionally feminine activities. Women, of course, are expected to identify with male heroes routinely, a state of affairs predating computer games. Until recently, few books, movies, TV shows, or video games about adventurous activities featured female heroes, and they're still very much in the minority. Women justifiably get tired of playing male heroes, and they appreciate the opportunity to play as female characters

8.a. Explain constrained and free form creative play.

Constrained Creative Play	Freeform Creative Play
Creates Artificial constraints	No Constraints are applied
Incorporate Rules of the game	Will not have any rules of the game
Provides a structure for players creativity	Cannot see any possibility of players creativity
Players are offered with additional resources or tools with restrictions	Players need not be offered with additional resources or tools without any restrictions
Difficult to test aesthetic standards	Easy to test aesthetic standards
These games usually have an end goal	These games usually don't have an end goal

8.b. What is temporal dimension? Explain variable time and anomalous time.

The temporal dimension of a game world defines the way that time is treated in that world and the ways in which it differs from time in the real world. In many turn-based and action

games, the world doesn't include a concept of time passing: days and nights or seasons and years. Everything in the world idles or runs in a continuous loop until the player interacts with the game in some way. In some games, time is implemented as part of the game world but not part of the gameplay. Minecraft is a good example of a game in which time is meaningful. Many of the enemies in Minecraft are inactive during the daytime. It's also darker and hard to see at night. In the underground portions of the game, day and night have less meaning, as you would expect.

Variable Time: Game time usually runs faster than real time, and jumps or changes rate. War games often don't implement nighttime or rest. For example In "The Sims" a game about managing a household Time speeds up when everyone goes to sleep, then slows down when characters wake up Time management is one of the most important challenges. The clock in the game is about 48 times as fast as in real life. But the motion is not that different from real life. Characters seem to do things slowly. Creates time pressure to complete tasks quickly.

Anomalous time—time can move at different speeds simultaneously in different parts of the game In The Settlers: Rise of an Empire game Time moves at different speed in different parts of the game. A tree can grow very fast. But overall they are well balanced. In Age of Empires 2 , in which tasks that should take less than a day in real time (gathering berries from a bush, for example) seem to take years in game time according to the game clock. Age of Empires does have a time scale, visible on the game clock, but not everything in the world makes sense on that time scale.

9.a. Explain the need of storytelling engine in game with a diagram depicting relationship with core mechanics?

To design a game that includes a story, you must interweave the gameplay—the actions taken to overcome the game's challenges—with the narrative events of the story. Narrative events must be interspersed among the gameplay events in such a way that all events feel related to each other and part of a single sequence that entertains the player. If the gameplay concerns exactly the same subject matter as the narrative—and it should, in orderto present a coherent and harmonious whole—then the entire experience, play and narrative together, will feel like one continuous story.

Just as the core mechanics generate the gameplay, the storytelling engine manages the interweaving of narrative events into the game. The core mechanics oversee the player's progress through the game's challenges; the storytelling engine oversees the player's progress through the game's story. The storytelling engine and core mechanics must work together to create a single, seamless experience.

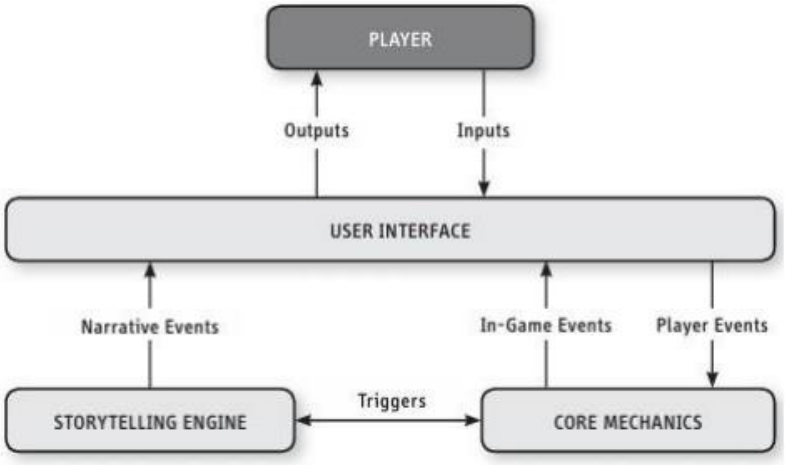

Figure 1 illustrates the relationship between the storytelling engine, core mechanics, user interface, and player.

An interactive story contains three types of events: player events, in-game events, and narrative events. The core mechanics manage the player events and in-game events, as thefigure shows. The storytelling engine manages the narrative events. However, the storytelling engine does more than just play movies or cut-scenes; it also keeps track of the progress of the story and determines what part of the plot should come next.

A double-headed arrow labeled Triggers connects the storytelling engine to the core mechanics.The core mechanics may determine that the interaction should stop and the storytelling engine should present some narrative—for instance, when a player completes a level. The core mechanics send a message to the storytelling engine saying that the player finished the level and the storytelling engine should now display any interlevel narrative events. Likewise, the storytelling engine can send a trigger back to the core mechanics when a narrative event finishes (or when the player interrupts a narrative event), telling the core mechanics to resume play.

The storytelling engine doesn't sit idle during play, however. As the player progresses, the mechanics continually send triggers to the storytelling engine—that way, the storytelling engine can keep up with what's going on. If, for example, the player makes a key decision that will affect the story later on, the core mechanics inform the storytelling engine of the decision.

Similarly, during play the storytelling engine can determine that the story has reached a critical plot point and trigger the core mechanics to cause changes to the internal economy of the game. Suppose the story says, "When the avatar reaches the bridge, he will be attacked by a highwayman in a cut-scene and robbed of all his property." The core mechanics, tracking the player's progressthrough the game world, send a message to the storytelling engine, "The avatar has reached the bridge." The storytelling engine detects that this is a key point, halts play, and displays a cut-scene showing the robbery. Then it

transmits a message back to the core mechanics saying, “Transfer the avatar’s inventory to the highwayman and resume play.” Normally, the level designers do the work that actually implements such events in the game. Among the leveldesigner’s tools for level-building will be a mechanism

9.b. Differentiate between linear and non linear stories.

Linear	Non Linear
Stories that player cannot change	Stories that player can change
Requires less content than non linear	Requires more content than linear
Story telling engine is simpler in Linear	Story telling engine is complicated in non Linear
Less prone to bugs and absurdities	More prone to bugs and absurdities
Deny the player agency	Accept the player agency
Capable of creating great emotional power	Less capable of creating great emotional power

10.a. How do you perform character dimensionality for defining characters of video games?

Characters may be classified into four groups: zero-, one-, two-, and three-dimensional. A character’s degree of emotional sophistication and the ways in which his behavior changes in response to emotional changes determine his degree of dimensionality.

Zero-dimensional characters exhibit only discrete emotional states. A zero dimensional character may exhibit any number ofsuch states, but there is no continuum of states; that is, the character’s emotional state never moves smoothly from one state into another or shows evidence of being in two states at the same time; there is no such thing as “mixed feelings.” The nameless orcs in The Lord of the Rings feel only two emotions: hate and fear. The orcs hate the heroes and attack. whenever they feel they outnumber their enemies, and they fear the heroes and run away whenever they feel vulnerable or outnumbered. This minimal level of emotional variability is typical of the enemies in a simple shooter game. The emotional simplicity of zero-dimensional characters can make them comic.

One-dimensional characters have only a single variable to characterize a changing feeling or attitude; in other respects their character is largely fixed. In The Lord of theRings, the dwarf Gimli is hostile and suspicious toward elves at first, but over time his respect for the elf Legolas grows until they are boon companions. His other attitudes don’t change much. The movies make him a more one-dimensional character than the book does

Figure 1 One-dimensional characters have a sin gle variable that describes an emotion that changes over time.

Two-dimensional characters are described by multiple variables that express their impulses, but those impulses don't conflict. Such variables are called orthogonal; that is, they describe completely different domains, which permits no emotional ambiguity. In The Lord of the Rings, Denethor is a two-dimensional character. He has a variety ofstrong emotions—pride, contempt, despair—but he never faces a moral dilemma. His senses of duty and tradition trump all other considerations, even when they are wildly inappropriate

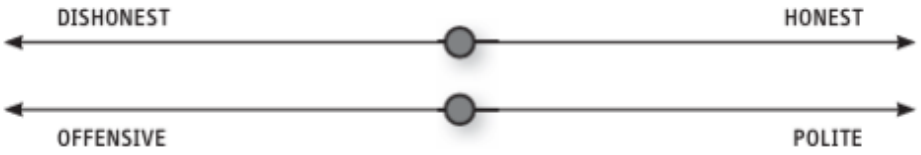

Figure 2 Two-dimensional characters have multi ple, non-conflicting impulses.

Three-dimensional characters have multiple emotional states that can produce conflicting impulses. This state of affairs distresses and confuses them, sometimes causing them to behave in inconsistent ways. Most of the major characters in The Lord of the Rings are three-dimensional, especially those who are tempted by the Ring. Frodo and, above all, Gollum are three-dimensional; Gollum's conflicting desires have driven him mad

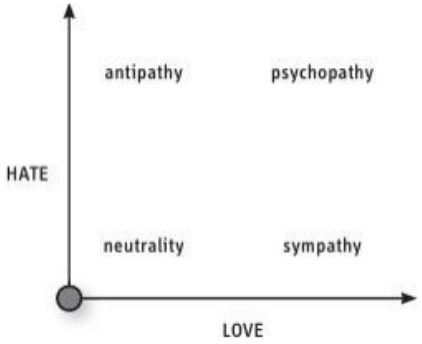

Figure 3 Three-dimensional characters can have conflicting impulses that produce inconsis tent behavior.

10.b. What do you mean by interactive stories? What are the different kinds of events in interactive story?

An interactive story is a story that the player interacts with by contributing actions to it. A story may be interactive even if the player's actions cannot change the direction of the plot. An interactive story includes three kinds of events:

■ Player events are actions performed directly by the player. In addition to giving the player actions to perform as part of gameplay—actions intended to overcome challenges—you can give the player additional actions to perform as part of the story. Role-playing by talking to other characters, for example, might serve the needs of the story even if overcoming the game's challenges does not require talking. If the player's actions can affect the plot of the story and change its future, they're called dramatic actions. Some player actions are not dramatic, however: Some player events aimed at overcoming challenges may not affect the plot.

■ In-game events are events initiated by the core mechanics of the game. These events may be responses to the player's actions (such as a trap that snaps when the player steps on a particular stone) or independent of the player's actions (such as a simulated guard character checking to see that the castle doors are locked). The player might be able to intentionally cause these events to occur, to change the way they occur, or to prevent them entirely— which is part of what makes the story interactive.

■ Narrative events are events whose content the player cannot change, although he may be able to change whether they occur or not. A narrative event narrates some action to the player; he does not interact with it. Narrative events are described in the "Narrative" section following this one