



CS3005: DIGITAL MEDIA AND GAMES



Designing Interactions for Games

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How do we interact with the game?

- Broken into two parts
 - 1. a device that can sense a player's physical motion (we're assuming we're not using mental devices just yet...)
 - 2. how the game interprets the movement into the virtual world
- Part 2 is related to mechanics/dynamics
- Part 1 can be decoupled from games a bit and discussed independently

Categories of Devices

- Touch-based
- Inertial-based
- Sound-based
- Camera-based
- “Advanced sensing”
- Each of these has subcategories as well

Touch-Based

- This category involves all devices that require physical contact to sense user input
- By far the largest/most common category
- Most are all electric circuit based, wherein a player completes a circuit by a motion, thus triggering a signal to the system

Touch-Based

- Binary Circuits
 - Button unpressed = low voltage
 - Button pressed = high voltage
- Angular Sensors (potentiometer)
 - Analog joysticks vary the voltage with position
- Electromagnetic Field
 - Surface with baseline electromagnetic state is disrupted by a finger touch
 - Resistive completes a circuit beneath

Controller Examples

- Keyboard
- Mouse
- Console Controller
- Specialized Console Controller

WASD and the Mouse

- The keyboard has been around for a LONG time (relatively speaking)
 - Devised in the early 1900s
 - With computing devices in the 60's
- The mouse... not as long, but still for a while
 - 1984
 - Xerox PARC and Apple and Microsoft

WASD and the Mouse

- What sort of games make sense for this control structure?
- Why?
- How does that affect the game play?

Inertial-Based

- Accelerometer
 - Senses the direction of acceleration and gravitational force on a single axis
- Magnetometer
 - Effectively a compass sensing the Earth's magnetic field
- Gyroscope
 - Senses angular velocity and change in force on a spinning mass

Handling Noisy Input

- Uncertain input can make games frustrating
- Player intention has to match game interpretation
- This breaks down into a *state estimation* problem
- By increasing or decreasing sampling rate, we can have a better prediction as to what state the device is in

Light Guns

- Flashing on the screen is interpreted by the device
- A ray can be traced from the gun aperture to the screen to determine the angle of attack

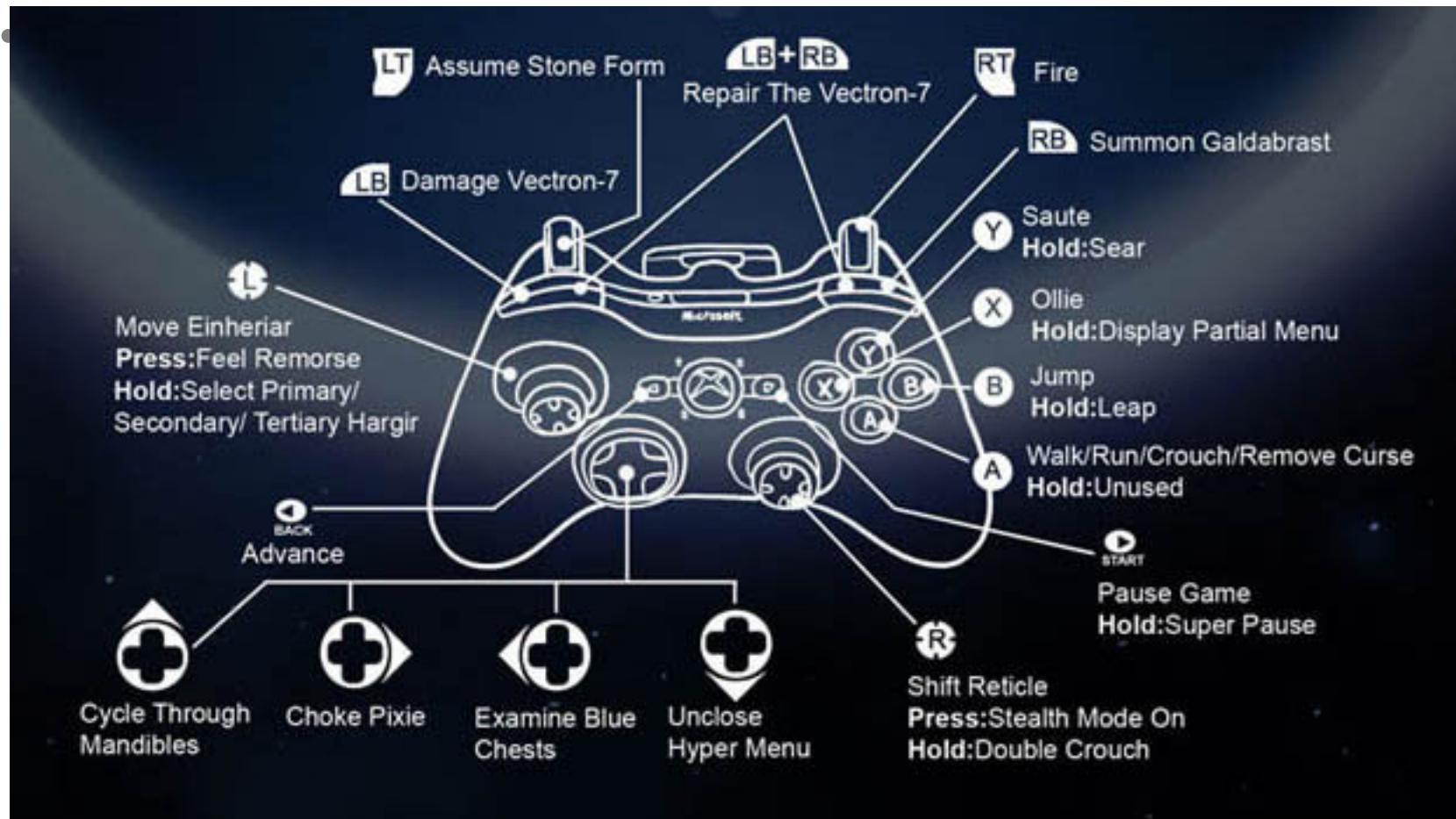
Sound-Based

- Speech Commands
- Calculate the Euclidian distance from a normalized sound clip to training clips stored in a database
- Additional training models can be layered on top of this
- Or you could ignore all of that and just go for pitch (i.e. Rock Band)

Camera-Based

- Blobfinding – latching on to specific colored things in the environment
- Background subtraction – over n frames, what hasn't changed? That's the background

Input Schemes



Input Schemes

- The bane of several genres
 - Sports
 - FPSSs
- The bane of touch screen games
 - Virtual sticks
 - Touch-to-move
- The bane of keyboard games
 - ... that's a lot of buttons...

“Accepted” Input Schemes

- How are these communicated to users?
- How do we get over the problem of “training” new gamers?

Okay... so that's control

- Now how do we relay info back to the user on screen
- The User Interface is essential to the feedback construct of games

Let's Take This Out of Video

- How do you consider user interface for non-digital games?
- What provides feedback?
- How is it enforced?

How “Easy” is “Easy”?

- Ease-of-use vs. Ease-of-learning
- Ease-of-use
 - If you already know what you want to do, how quick / easy is it to pull it off?
- Ease-of-learning
 - If you are new to a game, how easy is it to figure out what you are allowed to do and how to do it?
- Usually, there is a linear trade off between these two concepts

How “Easy” is “Easy”?

- Consider any WASD game
 - Tons of hot keys
 - ... tons of keys period
- Very quick to do many different actions
- How do you know which button to press?

How “Easy” is “Easy”?

- Consider a complex board game
 - Usually, there are tons of charts, symbols, icons, etc.
 - Very easy for an experienced player to know exactly what's going on
 - Intimidating to novice players

How “Easy” is “Easy”?

- Sometimes you can do both
- The concept here is called *recognition over recall*



Super Models

- The User Model
 - How the user “thinks” the system will behave
- The Program Model
 - How the game ACTUALLY will behave
- Program Model is always “right” with video games
 - This isn’t always true with board games!

Super Models

- You want these models to match as much as possible
 - Even if there is some “behind the scenes” shenanigans going on to make it look right
- Which is easier to change?
- How do you know if you need to change something?

Super Models

- Play testing!
- This is actually much more robust than in other software development
- You watch people play
 - See what buttons they press
 - When they press
 - How they press
 - How they interact
 - Watch lots of people!

If the Models are Wrong

- Frustration, embarrassment, anger are all reactions to an incorrect user model
- Probably not a central aesthetic to your game
 - (maybe...)

How important is UI design?

- If you screw up your UI for a text editor
 - The user might get a little frustrated
 - Might read the manual
 - Might realize they are using EMACS and quit
- If you screw up your UI for a game
 - The user gets very frustrated
 - The user may get angry
 - The user will never buy your game again
 - The user will leave lots of nasty comments

What are you trying to convey?

- The state of the world
- The rules
- The available actions/interactions
- How do you do this?
- How do you show the state while keeping gamers immersed?

Game

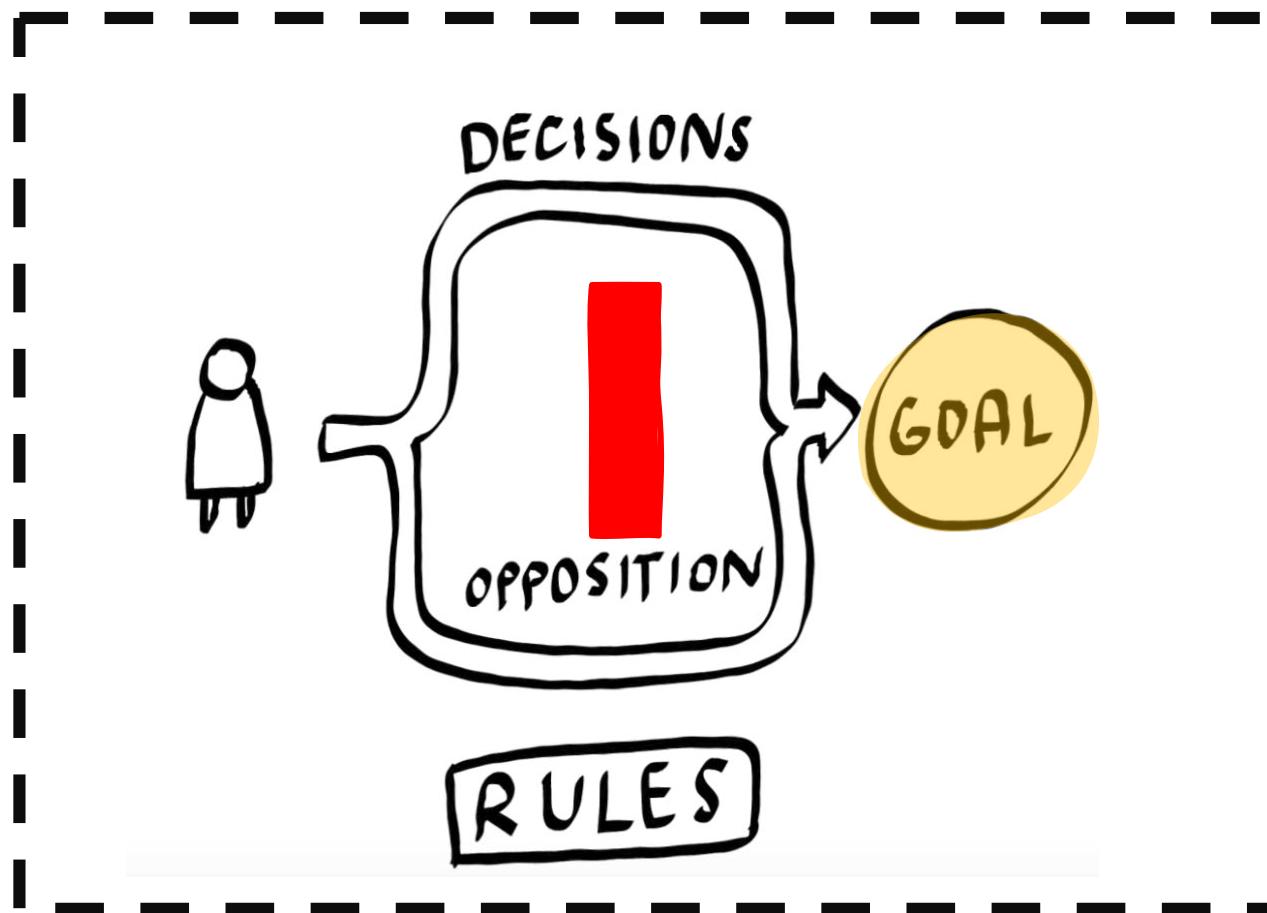
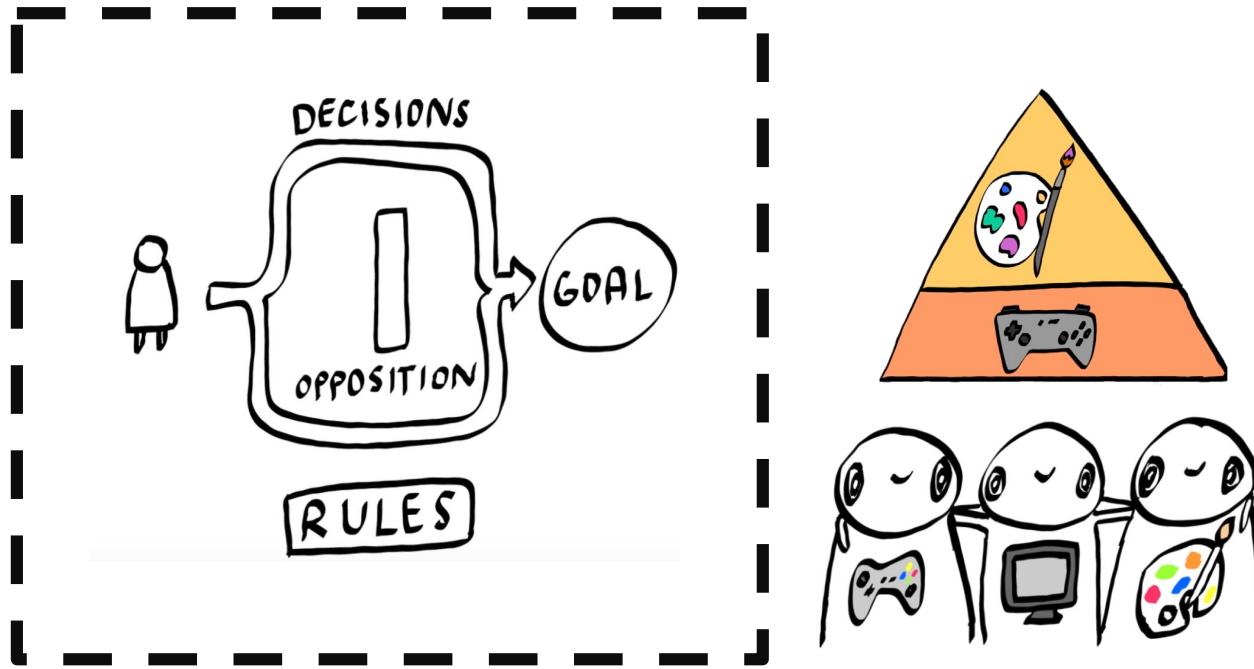


chart based on an picture by
Stone Librande

<http://stonetronix.com/>

Game



- art can effect gameplay
- game design can effect thematic, tone and game mechanics

Game Interface



targeting system

helmet displays



Game Interface



ammo counters

character action icon

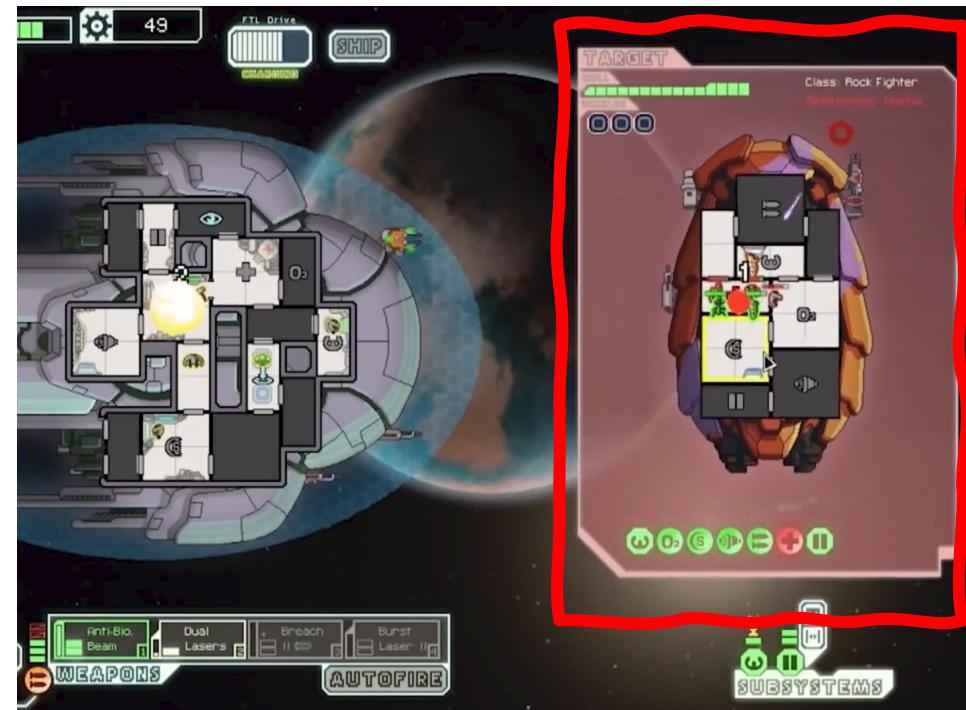


Game Interface

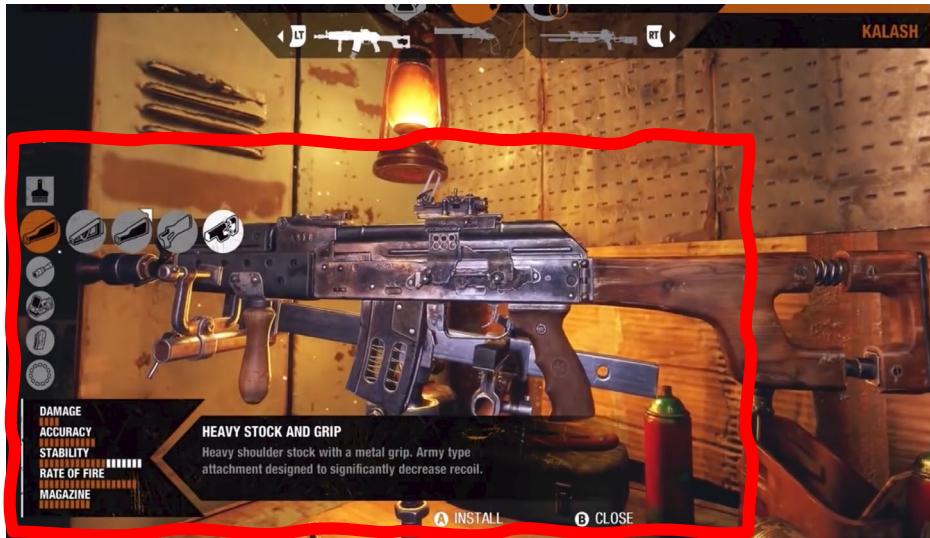


district management menu

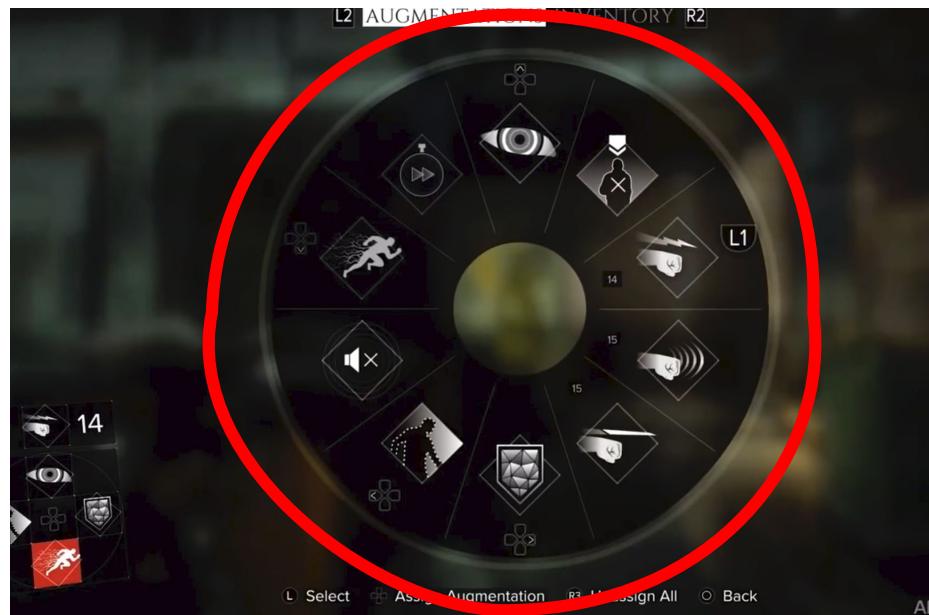
spaceship diagnostics



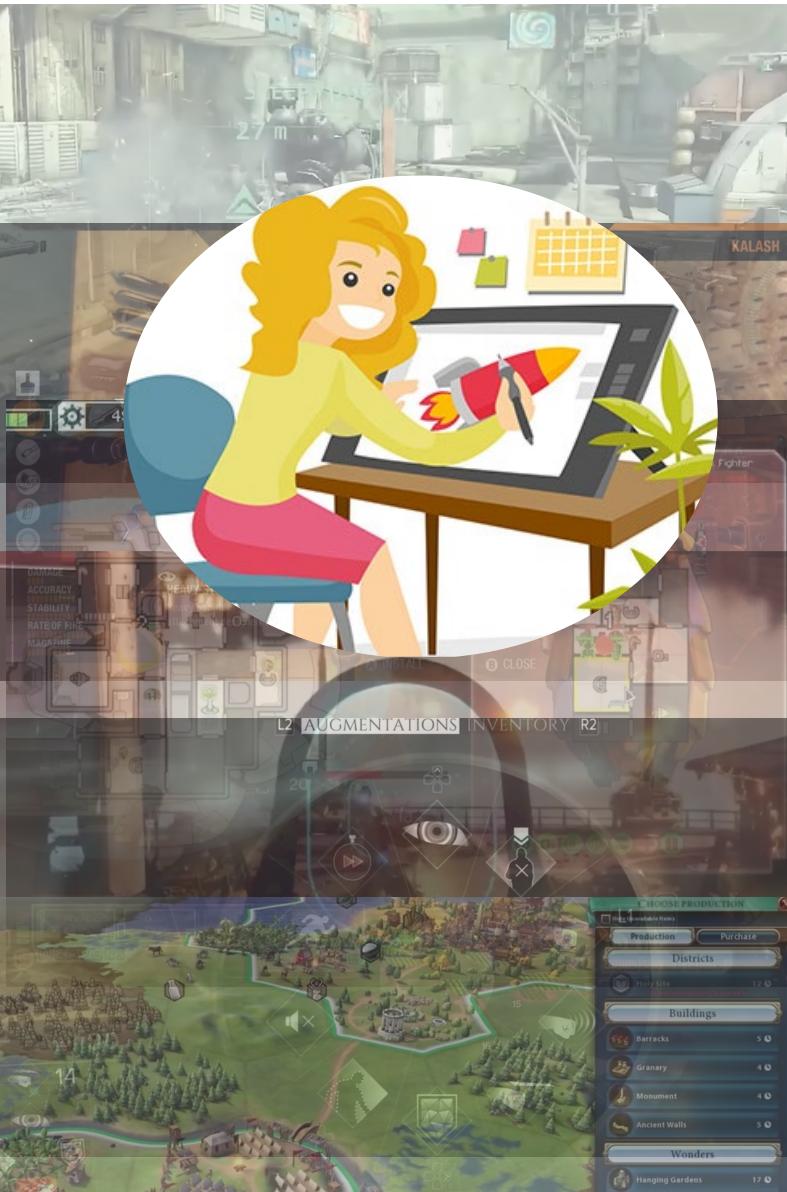
Game Interface



gun crafting interface



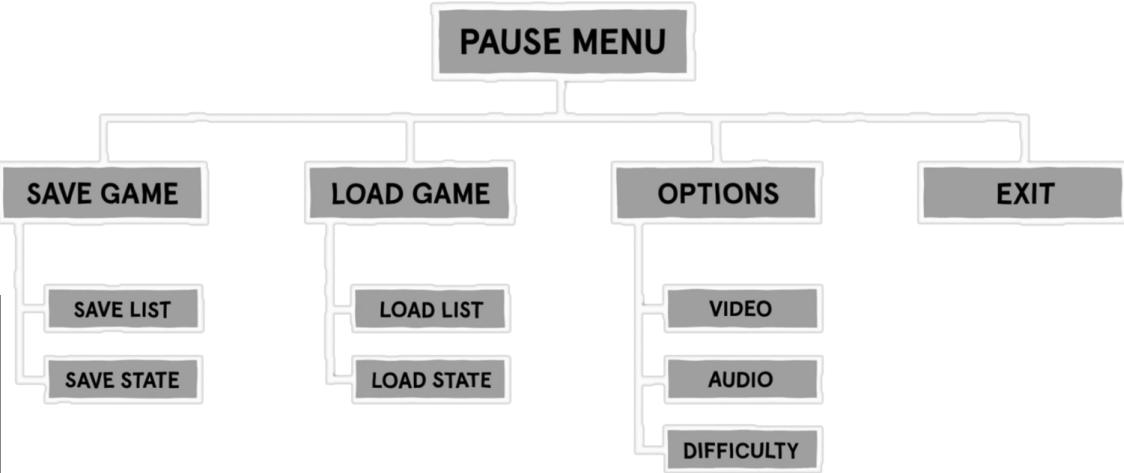
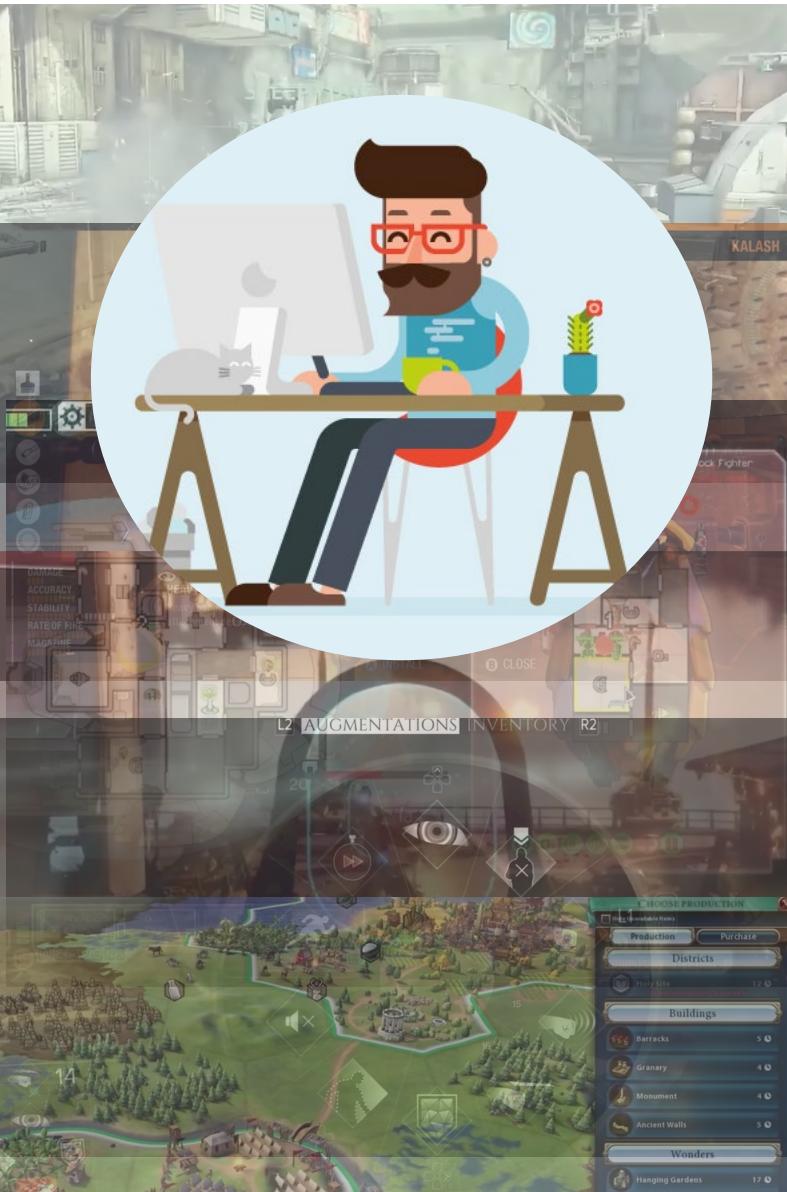
User Interface UI



UI is the interface through which a player interacts with a game

UI designer

User Experience UX

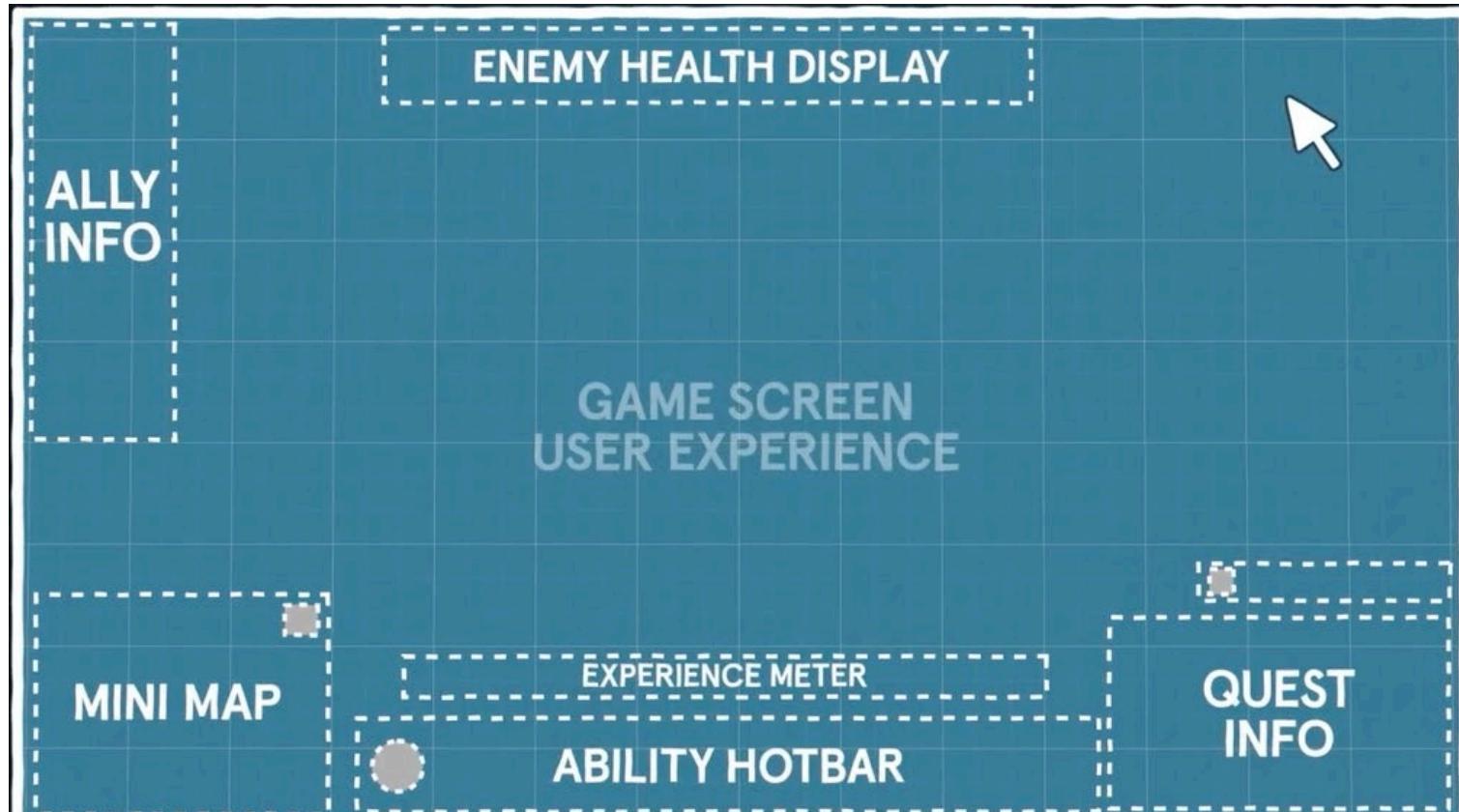


UX is the entire information architecture of a game

UX designer

UI and UX

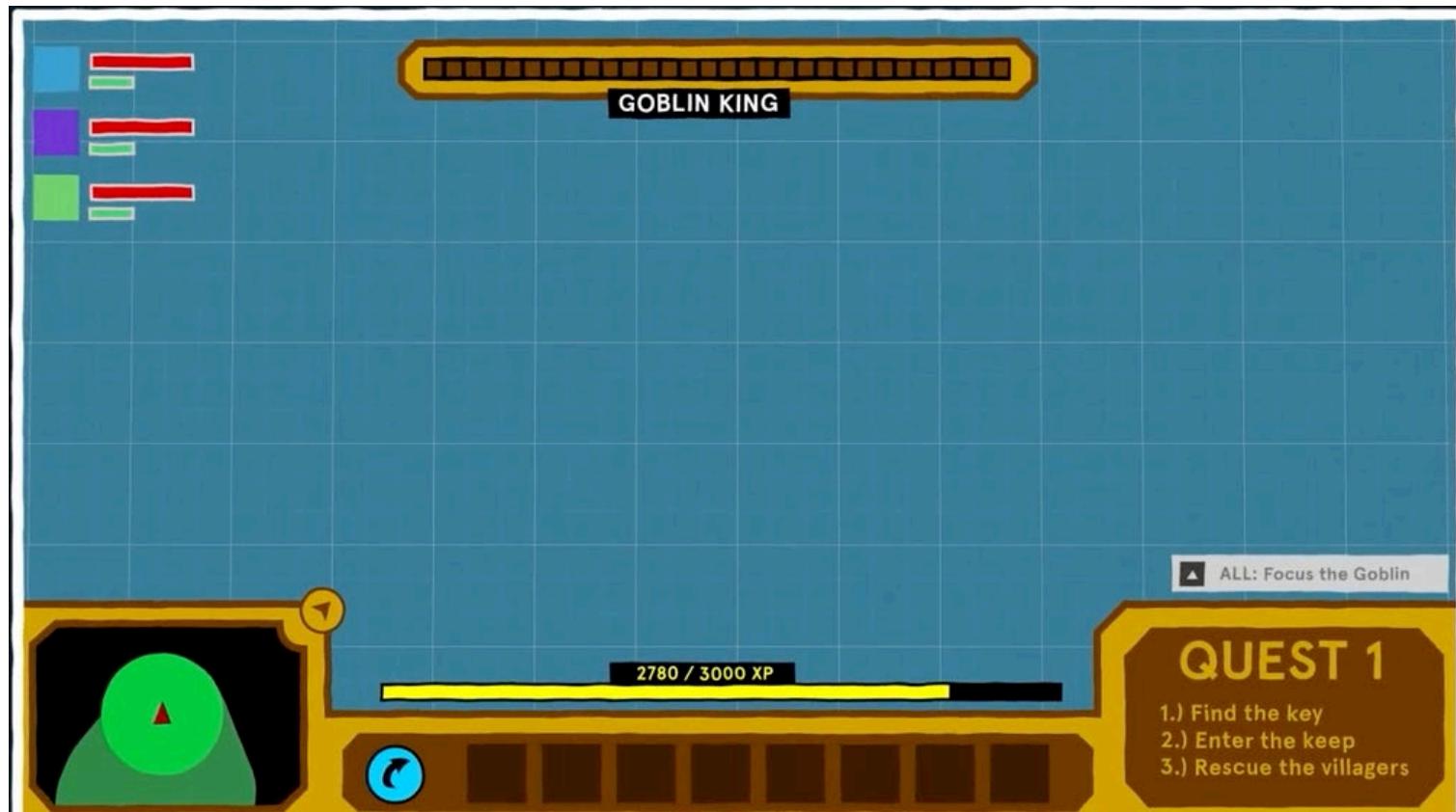
UX designer



helping the player get the information they need with the fewest necessary actions

UI and UX

UI designer



takes the UX design and builds out
the actual visuals and details

UI and UX



UI designer



UX designer

UI designer and UX designer work very closely
and even combined into the same rule

Visual Design Principles

- Recognise Diversity
 - many types of players should be able to intuitively understand and act upon the presented information
 - playing a game on PC is very different than playing the same game on mobile or console

Visual Design Principles

MOBILE



Mobile

PC



Fortnite

Visual Design Principles



Fortnite

Visual Design Principles



Visual Design Principles



Visual Design Principles

Game Genre

- some genres require a very robust UI
 - importance/role of UI varies per game
- UI makes a lot of information easily accessible and clear

Visual Design Principles

- trading card games
- 4x games
- simulation games

Visual Design Principles

- trading card games
- 4x games
 - [eXplore, eXpand, eXploit, and eXterminate]
- simulation games

Visual Design Principles



Faeria

Visual Design Principles



Faeria is 90% UI

In-class Activity



Could anyone give me any more examples of games where 90% is UI?

Visual Design Principles

- Informative feedback
 - narrative games:

might have a minimal UI if the player doesn't require as much real-time information



The Walking Dead

Visual Design Principles

- How do you make it all work together?

the goal is for every part of the game experience to feel unified and share a high level of flow

Consistency

Visual Design Principles

□ Consistency

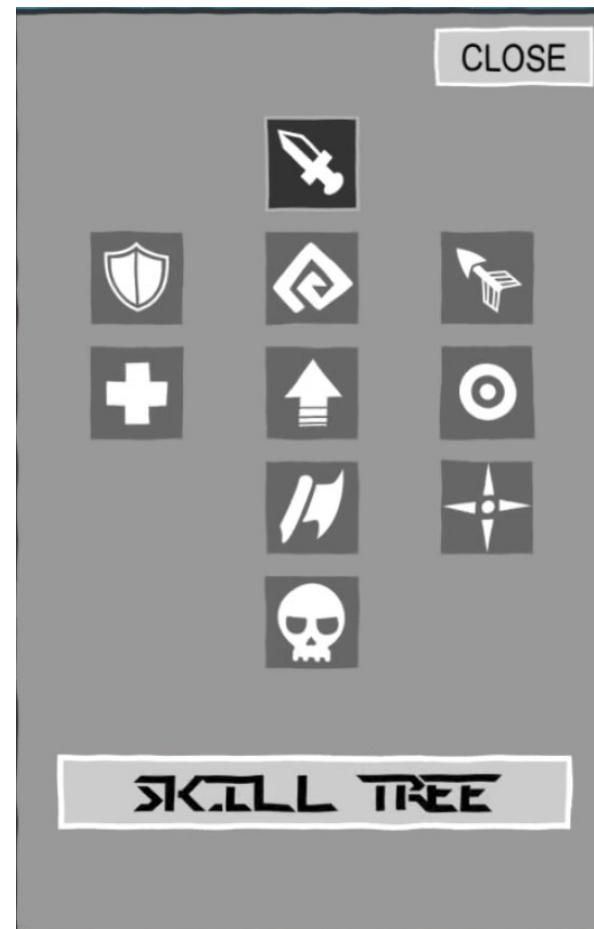
- consistent actions in similar situations
- identical terminology
- consistent color, capitalization, fonts
- style

Visual Design Principles

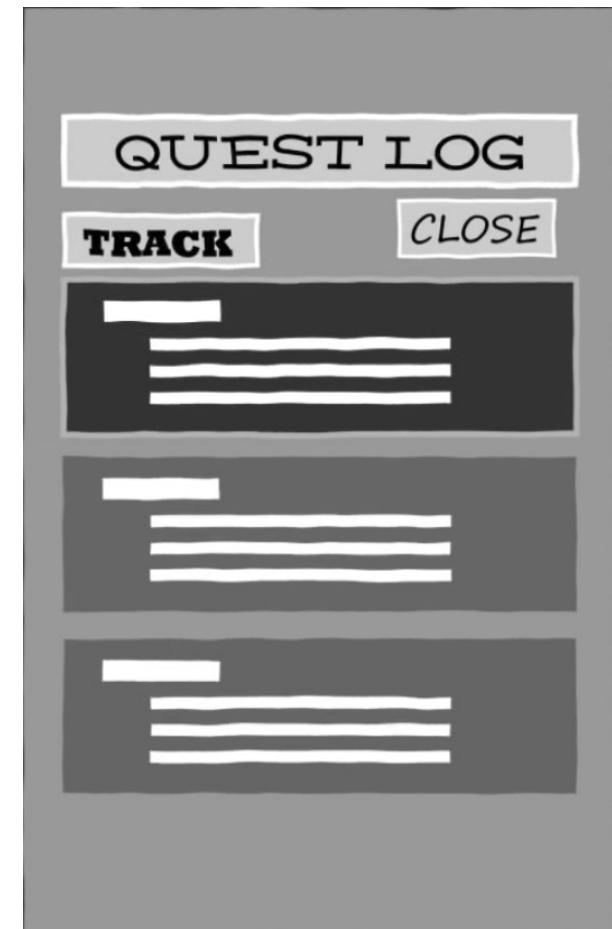
crafting window



skill tree window



quest window



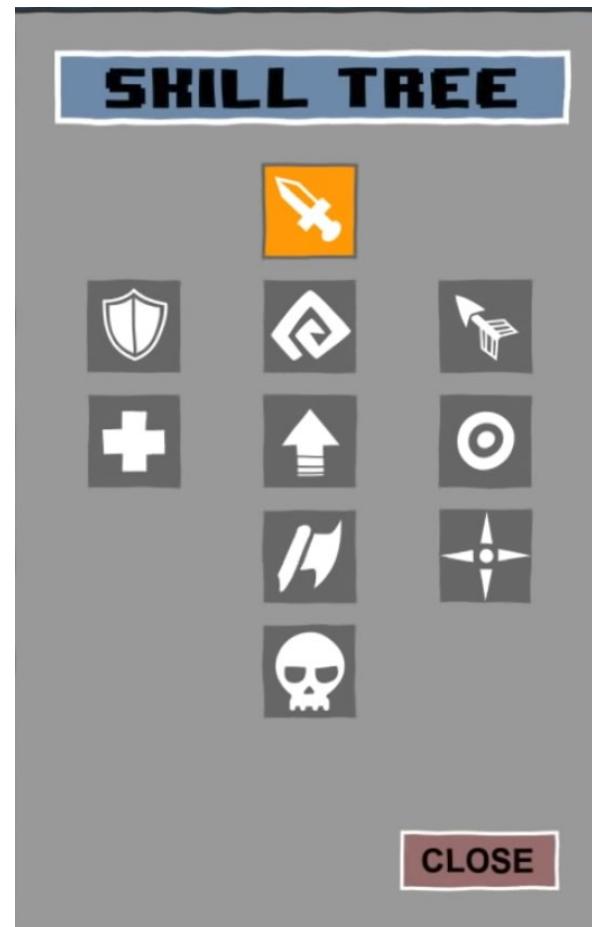
inconsistent

Visual Design Principles

crafting window



skill tree window



quest window



consistent

Visual Design Principles

Case Study



**League of Legends
client**

League of Legends Client

- They start by defining the core thematic behind UI
- Then they came up with very specific rules and guidelines for the style like typography, iconography, color, shape language, animation
- One of core parts of the thematic is **hextech** magic

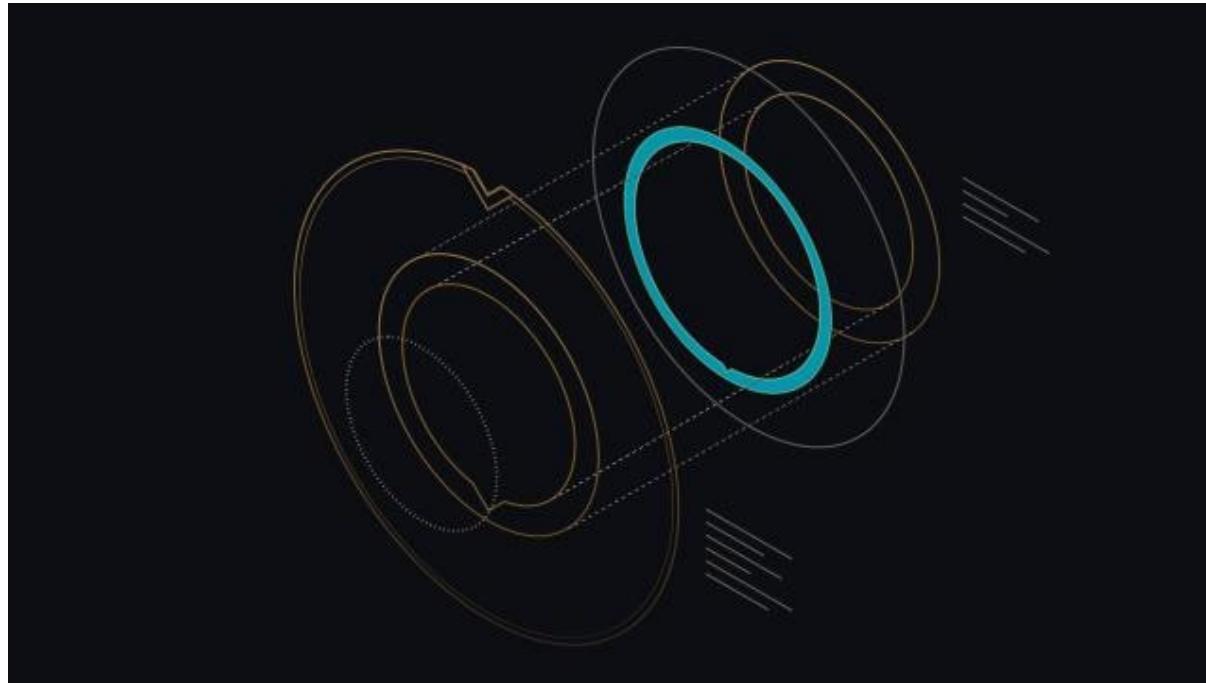
League of Legends Client

CORE THEMATIC



one of core parts of thematic
is: **hextech** magic

League of Legends Client

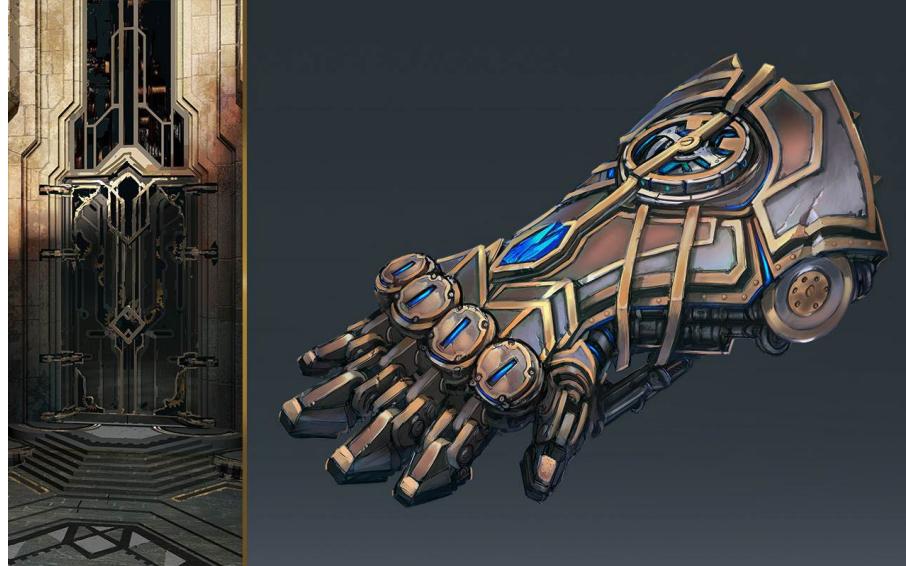


- hextech** brings the **magic** to the UI
- UI elements with **gold** metalwork.

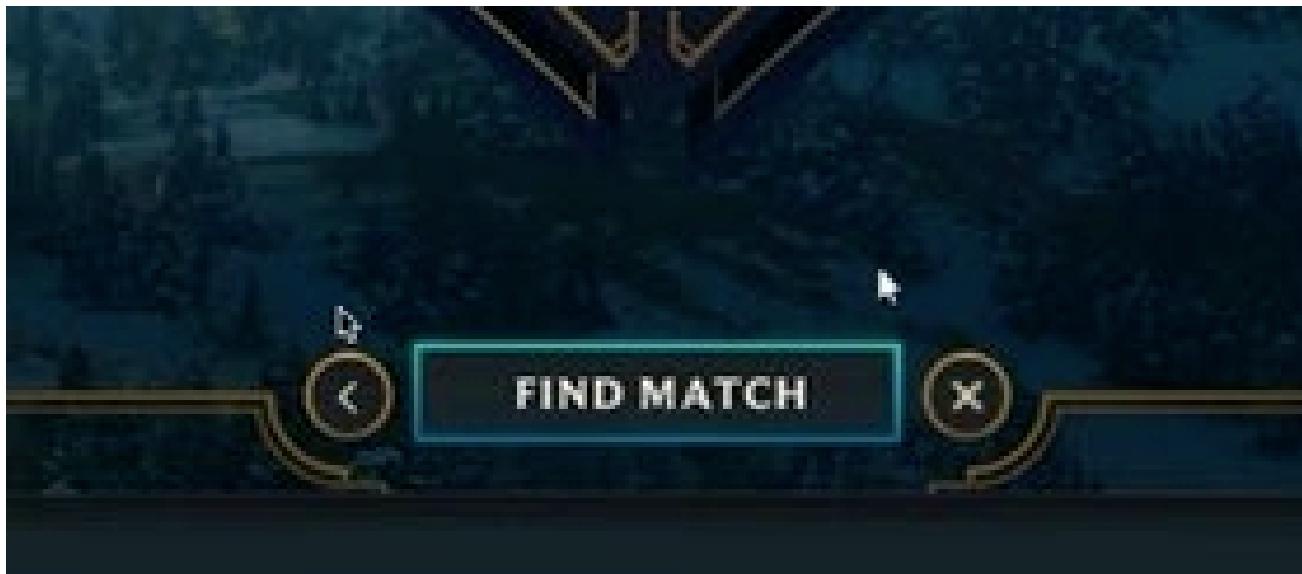
League of Legends Client

Hextech is a type of technology:

- that's half **magic**
- half **machinery**
- It allows non-magic users to harness magical power



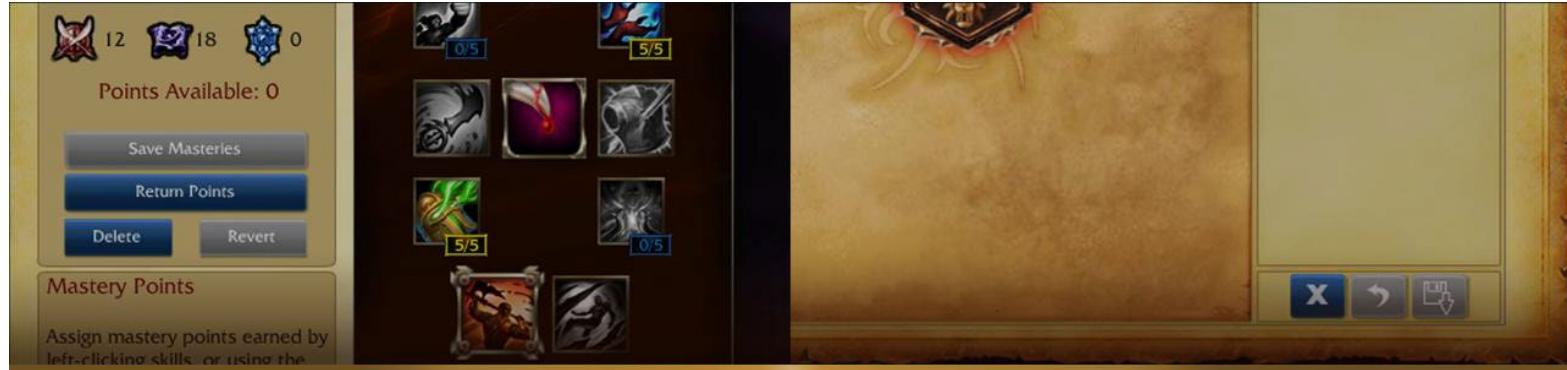
League of Legends Client



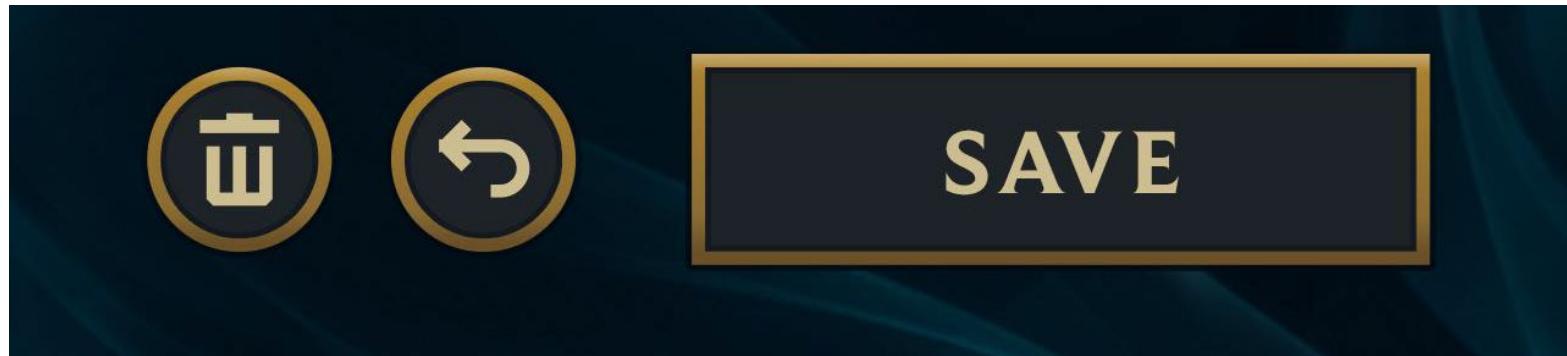
cohesive visual style:

- unify similar operations
- under consistent interaction patterns.
- making stuff simpler by using fewer crazy buttons.

League of Legends Client



UI elements from the legacy client



UI elements from the updated client

League of Legends Client



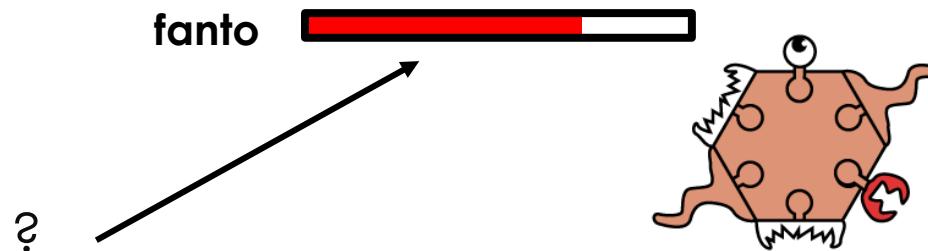
To read more:

<https://nexus.leagueoflegends.com/en-us/2016/12/the-visual-language-of-hextech/>

Visual Design Principles

□ Layout

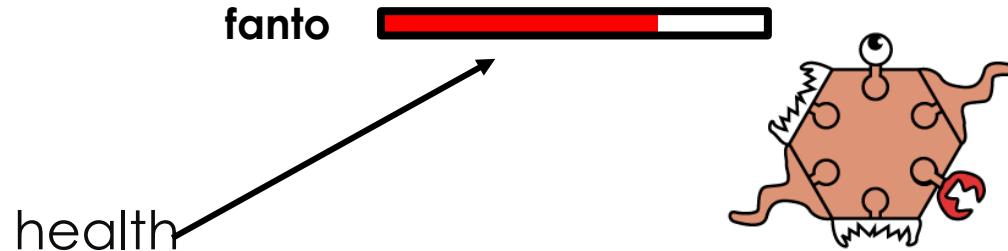
- designing layout is like a puzzle and you need to figure out all the different ways that it can come together
- layout is critical because it effects the way the viewer understands information on screen



Visual Design Principles

□ Layout

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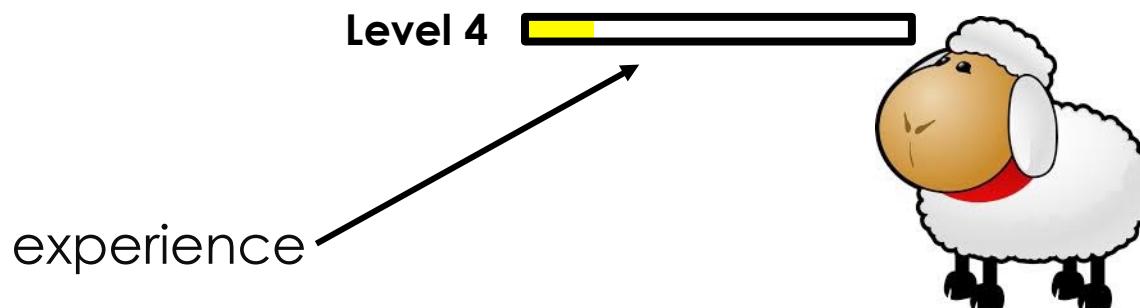


brain makes association between something like a proximity between word and images

Visual Design Principles

□ Layout

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brain makes association between something like a proximity between word and images

Visual Design Principles

□ Layout



Dead Space is a third-person
shooter/horror game

Visual Design Principles

□ Layout



Dead Space is one game that does the User Interface extremely well

Visual Design Principles

□ Layout



?

integrates the user interface with
the character

Visual Design Principles

□ Layout



integrates the user interface with
the character

Can you identify the UI/UX elements in the game?



watch
identify

share

When poll is active, respond at PollEv.com/nadineaburum700



94%

100%



health
stasis
current weapon
ammo

[DIALOGUE TEXT HERE]

RIG-LINK



map
chat
inventory



watch again



**immersive UI in video games
non-diegetic UI vs diegetic UI game**



meta UI game

CALL OF DUTY



spatial UI game

Fable 3



Assassin's Creed?

- non-diegetic UI**
- diegetic UI**
- spatial UI**
- meta UI**



Assassin's Creed?

- non-diegetic UI**
- diegetic UI**
- spatial UI**
- meta UI**

Game Interface

□ data



Game Interface

□ Head-Up Display [HUD]

any transparent display that presents data without requiring users to look away from their usual viewpoints



Game Interface

□ menus



What are the most common game interface mistakes?



World of Warcraft



CS3005: DIGITAL MEDIA AND GAMES

Questions?

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