

Lecture 6

Game Prototyping

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Game Prototyping

What is a prototype?

From Oxford Dictionary:

A first or preliminary version of a device or vehicle from which other forms are developed.

If we modify this for games:

An early version of a game from which further versions are developed.

What is a game prototype?

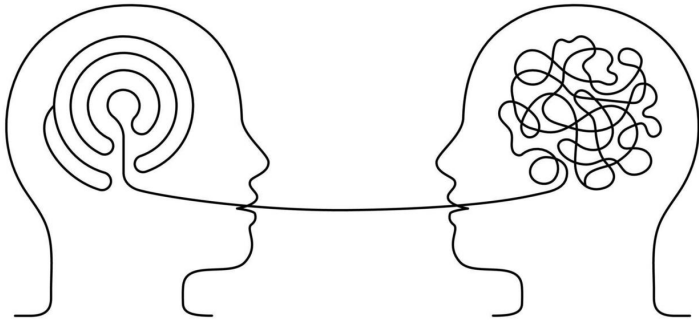
Make it complete:

An early version of a game made to *present* and *test* certain game mechanics and visuals, to receive *feedback* on these and to *guide* later development.

Keywords:

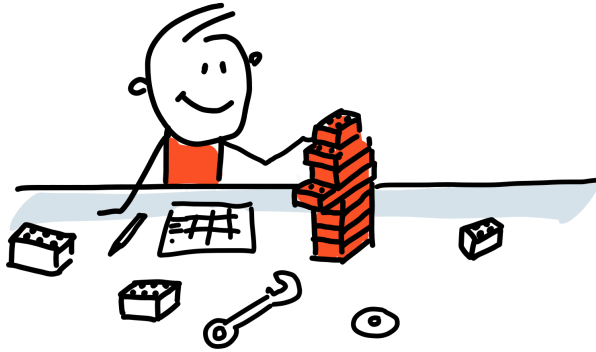
- Present
- Test
- Feedback
- Guide

Present an Idea



- Often times it is difficult to present an idea to another person just by *explaining*
- A game idea encompasses many deep and obscure features
 - Gameplay
 - Rules
 - Visuals
 - Controls
 - Theme
 - Perspective
 - View

Present an Idea



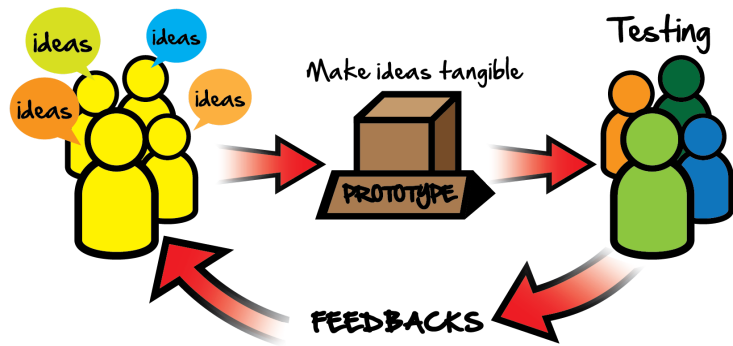
- A prototype helps clarify details to others when communicating your idea.
- Instead of explaining things, you can *show* them
 - Mostly core mechanics
 - Some textures, sketch art etc.
- Improves team communication

Test an Idea



- You can also test your idea and see what works and what not
- You can also make others test it
- This allows you to detect problems early and think about potential fixes

Receive Feedback



- A crucial part of prototyping is receiving feedback
- What you think is charming may be boring for others
 - Rule 1 of Game Design: **You are not designing for yourself!**
- Early feedback allows you to make major maneuvers before entering no-exit alleys
- The prototype feedback loop is a ...well... loop
 - Prototype
 - Test
 - Receive feedback
 - Repeat

Receive Feedback

- How to receive feedback
 - Accept feedback openly
 - Incorporate quickly
 - Modify and test as soon as possible
- How not to receive feedback
 - Do not fight against feedback
 - Do not adamantly defend your mistakes
 - Do not make lengthy discussions on feedback

Guide Design

- Once you have a successful feedback loop
 - Start converting prototype to design
 - What most intrigued your testers?
 - Emphasize it in design
 - What was most boring and disliked?
 - Remove it if possible, or replace
 - Did you receive any nice recommendations? Incorporate them.
 - Did you discover new mechanics? Use them.

Why prototype?

- Prototyping lets you see the problems in your *mental design*
- Prototyping allows you to take *feedback*
- Prototyping is *cheap and fast*
 - Saves you from blindly spending time and money
- Prototyping helps you *save* your ideas

When to prototype?

- Prototyping is to be done just before the game design phase
- Prototyping allows you to better organize your design
- It can also be considered as the first step of game design
- You can also exit prototyping with a prototype document which includes how to *read* your prototypes and comments on core mechanics testing

Types of Prototypes

Types of prototypes

- Game prototyping is usually done in 4 forms:
 - Physical
 - Digital
 - Visual
 - Textual

Physical Prototyping



- The most classical type of prototyping
- You use ordinary office material to build a prototype of the game
 - Pen
 - Paper
 - Scissors
 - Rulers
 - Figurines
 - Clay

Physical Prototyping

- Not all game ideas are immediately suitable for physical prototyping
 - Board games, puzzle games, strategy games are more suitable
 - Action games, Sports games are less suitable
- You do not try to prototype the whole game
 - Only prototype a certain mechanic, scene, level, theme, etc.

Physical Prototyping

- Physical prototyping can be really fun
- But do not be charmed
 - You have to be quick
 - You have to be rough
 - Your prototype must be open to modifications

Physical Prototyping

BC0652 - Oyun Prototipleme - Defeat The Dragon



Physical Prototyping

BCO652 - Oyun prototipleme



Physical Prototyping

BCO 652-Oyun Prototipleme (Wedding Day Prototip)



Physical Prototyping

BC0652 - Oyun Prototipleme Projesi



Digital Prototyping

- Digital prototyping is used to see how certain mechanics work in the game
- You use a software to digitally prototype your game
 - Quickly
 - Cheaply
 - Roughly
- Do not get lost in details
- You do not have to program every single mechanic
 - Focus on what you want to present/test

Digital Prototyping Tools

- Rapid game development tools and no-code/low-code tools are famous for prototyping
- Construct 2D
- GDevelop

The screenshot displays the GDevelop game engine interface. At the top, there are tabs for 'Home', 'Level1', and 'Level1 (Events)'. Below the tabs are icons for home, refresh, and save, along with 'Preview' and 'Share' buttons. The main workspace is a grid-based editor showing a maze-like level with yellow floors, red walls, and several rooms containing objects like 'Man', 'Soldier', and 'Door'. A 'Ring' object is currently selected.

Properties Panel (Left):

- Object - Ring
- [Edit object](#)
- Instance
 - X: 96, Y: 128
 - Angle: 0
 - Lock position/angle in the editor
 - Prevent selection in the editor
 - Z Order: 8
 - Layer: Base layer
 - Custom size
 - Width: 32, Height: 32
 - Animation: 0
- Instance Variables

Objects Panel (Right):

- Search objects
- Global Objects
- Scene Objects
 - YellowBackground
 - Man
 - Soldier
 - Wall
 - Door
 - Ring (Selected)
 - Bullet

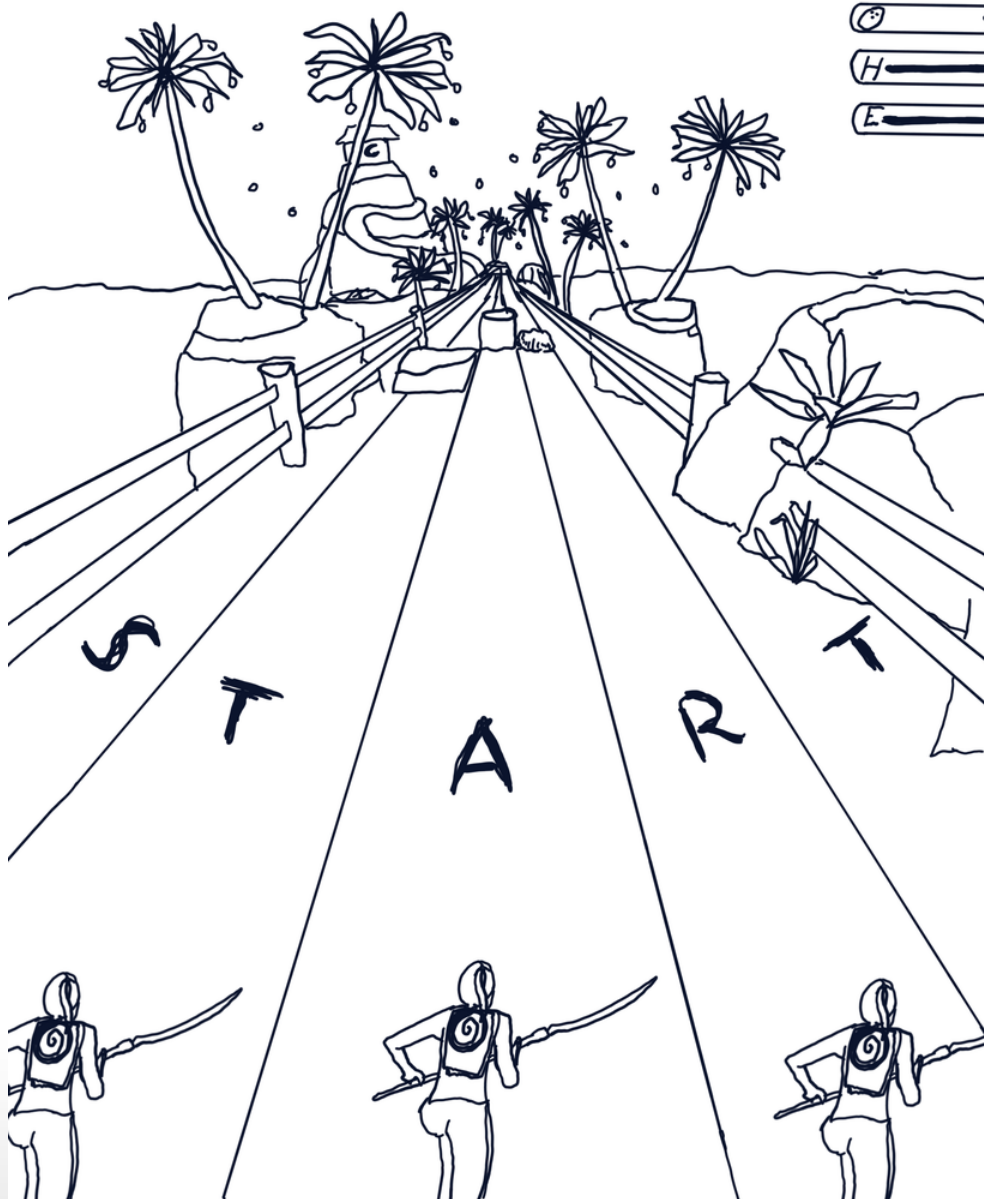
Layers Panel (Bottom):

- Base layer (Selected)
- Background Layer
- Background color
- [Add a layer](#)

GDevelop

- [GDevelop](#) is one of the best tools in the market for rapid prototyping.
- It is open source and completely free to use
- It supports 2D and *3D* development
- It doesn't require knowledge any programming languages
- It doesn't require an installation to use
 - [GDevelop Editor](#)

Visual Prototyping



- Visual prototyping is done to present the main looks and theme of a game
- It may include
 - texture,
 - character sketches,
 - object sketches,
 - environment sketches...
- It may also be used to show game flow or game mechanic
- It may also be used to show level layouts, world layouts, etc.

Visual Prototyping

- The differences between physical prototyping and visual prototyping
 - Physical prototypes are *interactable*
 - Visual prototypes are *static*
 - Object of prototyping
 - *Looks and appearance* in visual prototype
 - *Core mechanics* in physical prototype

Textual Prototyping

weap-343.txt Last edited 2004-08-15 for NetHack 3.4.3
Weapons, weapon skills, and combat modifiers in NetHack 3.4
Compiled for 3.2.2 by Kevin Hugo.
Updated for 3.4.3 by Dylan O'Donnell <psmith@spod-central.org>.

WEAPON (Table 1)	COST	WGT	PROB	MATL	APPEARANCE
Dagger	:	:	:	:	:
orcish dagger	: \$ 4	10	12	: IRON	crude dagger
dagger	: 4	10	30	: IRON	--
silver dagger	: 40	12	3	: SILV	--
athame	: 4	10	0	: IRON	--
elven dagger	: 4	10	10	: WOOD	runed dagger
Knife	:	:	:	:	:
worm tooth	: 2	20	0	: NONE	--
knife (shito)	: 4	5	20	: IRON	--
stiletto	: 4	5	5	: IRON	--
scalpel	: 6	5	0	: METL	--
crysknife	: 100	20	0	: MINL	--
Axe	:	:	:	:	:
axe	: 8	60	40	: IRON	--
battle-axe	: 40	120*	10	: IRON	double-headed axe
Pick-axe	:	:	:	:	:
pick-axe	: 50	100	tool	: IRON	--
dwarvish mattock	: 50	120*	13	: IRON	broad pick
Short sword	:	:	:	:	:
orcish short sword	: 10	30	3	: IRON	crude short sword
short sword (wakizashi)	: 10	30	8	: IRON	--
dwarvish short sword	: 10	30	2	: IRON	broad short sword
elven short sword	: 10	30	2	: WOOD	runed short sword
Broadsword	:	:	:	:	:
broadsword (ninja-to)	: 10	70	8	: IRON	--
runesword	: 300	40	0	: IRON	runed broadsword
elven broadsword	: 10	70	4	: WOOD	runed broadsword
Long sword	:	:	:	:	:
long sword	: 15	40	50	: IRON	--
katana	: 80	40	4	: IRON	samurai sword
Two-handed sword	:	:	:	:	:
two-handed sword	: 50	150*	22	: IRON	--
tsurugi	: 500	60*	0	: METL	long samurai sword
Scimitar	:	:	:	:	:
scimitar	: 15	40	15	: IRON	curved sword
Saber	:	:	:	:	:
silver saber	: 75	40	6	: SILV	--
Club	:	:	:	:	:
club	: 3	30	12	: WOOD	--
aklys	: 4	15	8	: IRON	thonged club
Mace	:	:	:	:	:
mace	: 5	30	40	: IRON	--
Morning star	:	:	:	:	:

- Textual prototyping is for main game mechanics balance
- It can be done with pen and paper
 - You can also use digital tools
- It is mostly about creating tables and balancing parameters
 - ...through extensive core mechanics testing
 - ...but you do the tests on paper, not on a physical prototype

Textual Prototyping

- It is recommended to check your core mechanics balance using textual prototyping
- You can also get help from Excel, programming etc.
- Game balancing in complex scenarios can be overwhelming
 - Sometimes you can figure out certain quirks only in testing

TASK

Exercise task

- Form groups of 2 and play the following game to test core mechanics balance
- You have three units to choose:
 - Warrior: 20 HP, 16 DMG, 8 AC, 50 G
 - Wizard : 12 HP, 24 DMG, 4 AC, 40 G
 - Rogue : 15 HP, 2x12 DMG, 6 AC, 60 G
- You have 180 G each.
- Build an army and fight each other
- See if you can find a dominating strategy
 - Is there an invincible army?
 - Is the rock-paper-scissors principle existing?

Exercise task

- You have to place your army in a 2 by 2 field

```
X3 X4 <- rear row
X1 X2 <- front row

Y1 Y2 <- front row
Y3 Y4 <- rear row
```

- Each unit can attack any unit in the opponent's front row
- Only wizards and rogues can attack from the rear rows
- When a unit in the front row dies, the one in the rear row moves to the front row
- Rogues can attack twice a single unit, or attack once to each of two units
- All units attack simultaneously each round
 - There is no priority of attack
 - Enemy units can kill each other at the same round