

TESTING IN GAME DEVELOPMENT

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TUTORIAL STAGE

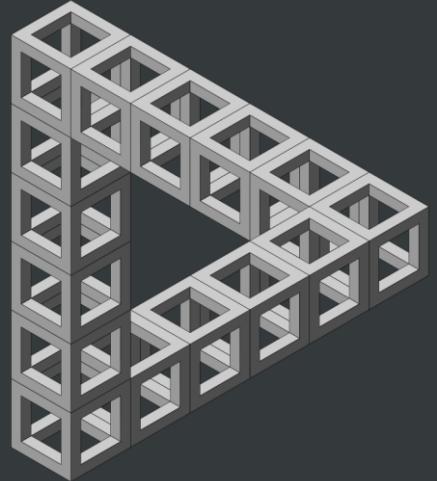
INTRODUCTION

”A delayed game is eventually good, but a rushed game is forever bad”

-Shigeru Miyamoto

- Why test games
- The game team
- Game production cycle

► INTRODUCTION: Why test games



Complexity



Budget

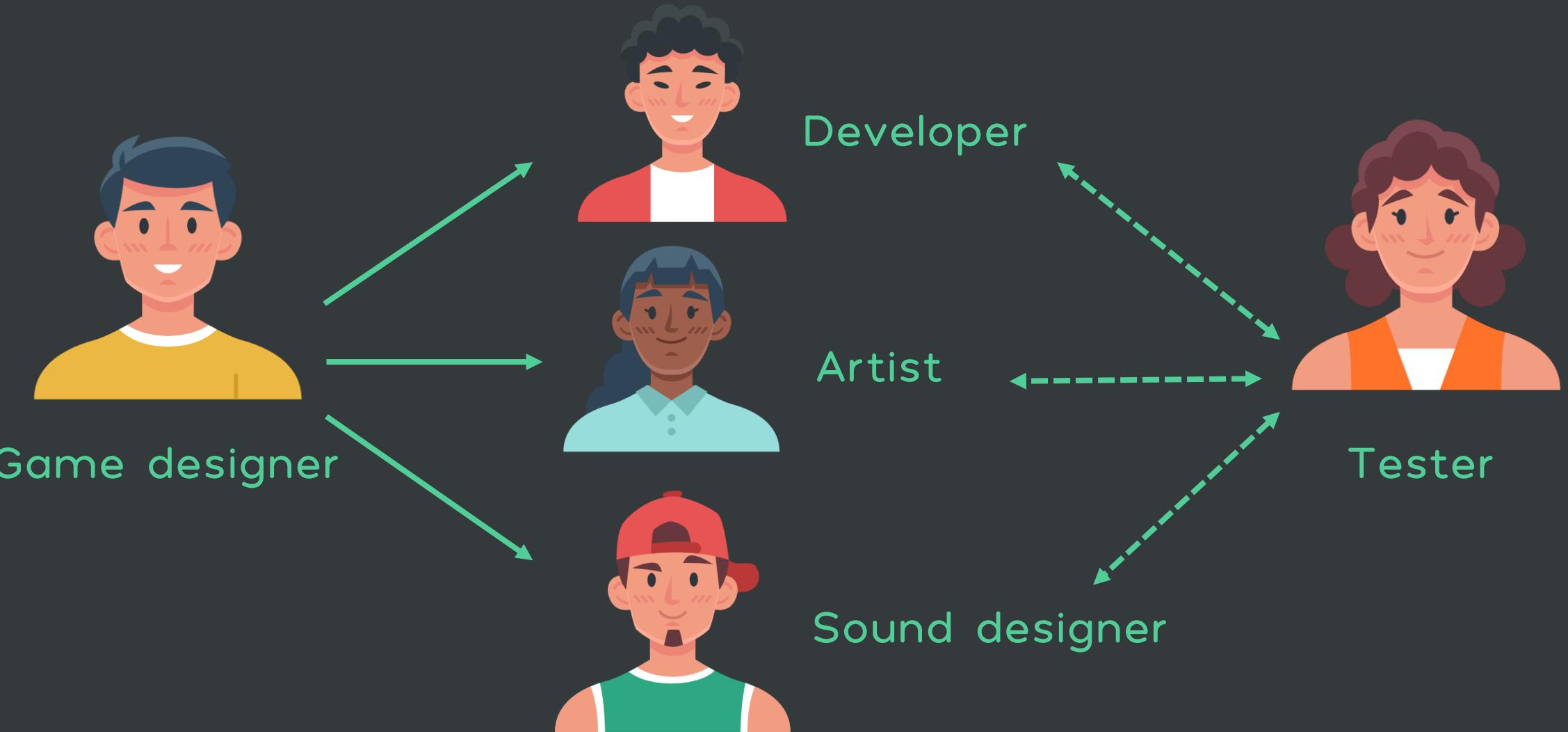


Multiple Platforms

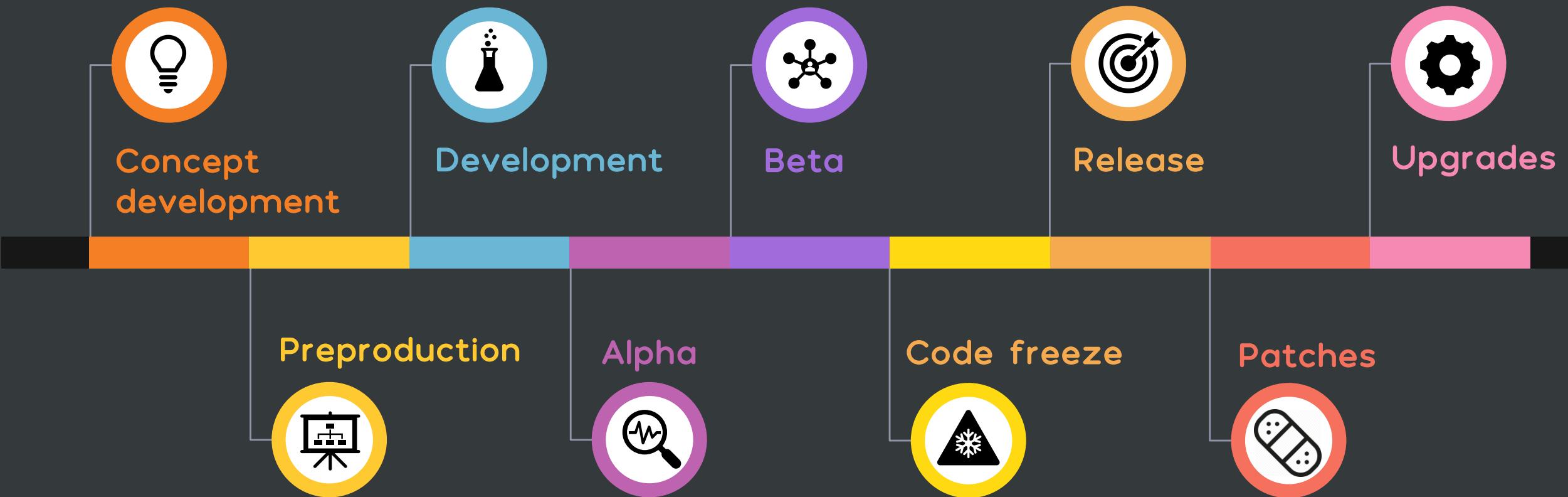


Critics

► INTRODUCTION: The game team [1]



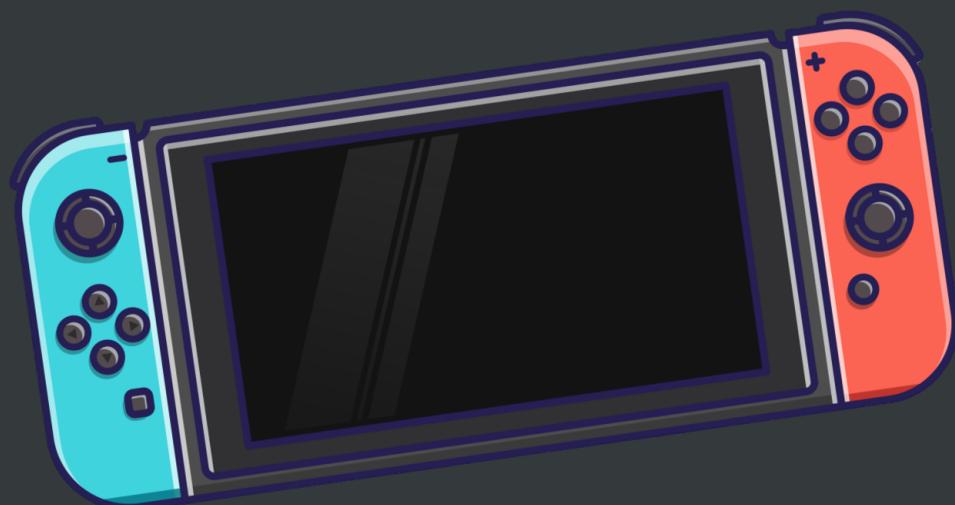
► INTRODUCTION: Game production cycle [1]



INTRODUCTION

STAGE 1

GAME TESTING

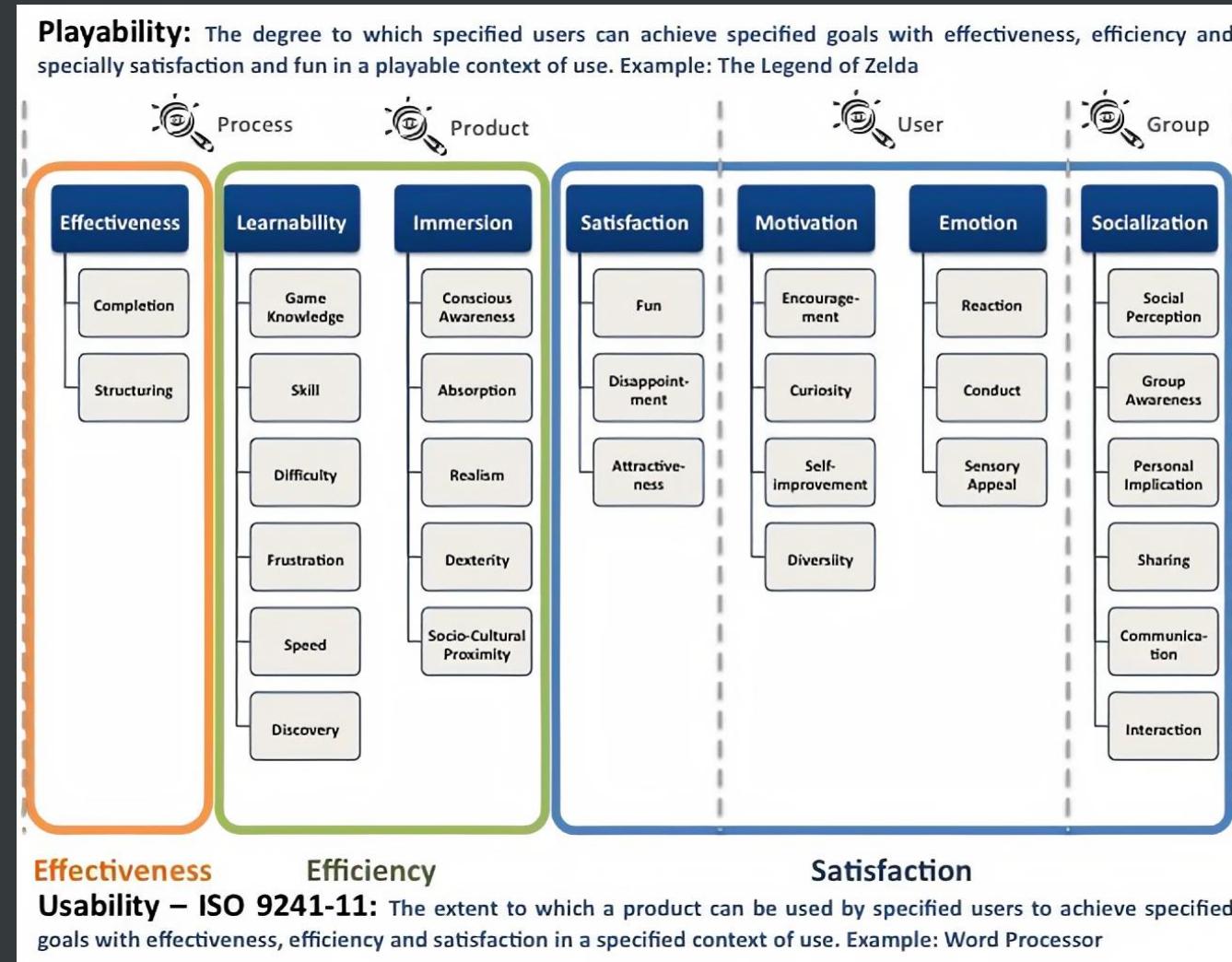


- Quality factors
- Types of game testing
- The test process

► GAME TESTING: Quality factors [1][2]



► GAME TESTING: Quality factors (cont.) [2]



► GAME TESTING: Quality factors (cont.) [3]

	Short-term	Long-term
Motivation	Interest	Rewards
Choices	Tactics	Strategy
Balance	Variables	
Usability	Control	Mastery
Aesthetics	Sensory	Contemplative

First
↓
Last

► GAME TESTING: Types of game testing [1]

Compliance testing

Functionality testing

Performance testing

Localization testing

Play testing

Ad-hoc testing

Balance testing

Accessibility testing

► GAME TESTING: Types of game testing (cont.) [1]

Combinatorial testing

Gender	Light Saber
Male	1H
Male	2H
Female	1H
Female	2H

Pairwise Combinatorial Table - BioShock

Test No	Setting 1	Setting 2	Setting 3	PASS/FAIL	Comments
1	PlayerJump	PlayerShoot	N/A	PASS	
2	PlayerMove	PlayerShoot	N/A	PASS	
3	NoAmmo	PlayerShoot	N/A	FAIL	This is right.
4	PlayerMove	PlayerJump	PlayerShoot	PASS	
5	PlayerMove	MoveCamera	N/A	PASS	
6	MoveCamera	PlayerShoot	N/A	PASS	
7	PlayerCrouch	PlayerMove	N/A	PASS	
8	PlayerCrouch	PlayerShoot	N/A	PASS	
9	PlayerCrouch	PlayerMove	PlayerShoot	PASS	

► GAME TESTING: Types of game testing (cont.) [1]

Cleanroom testing

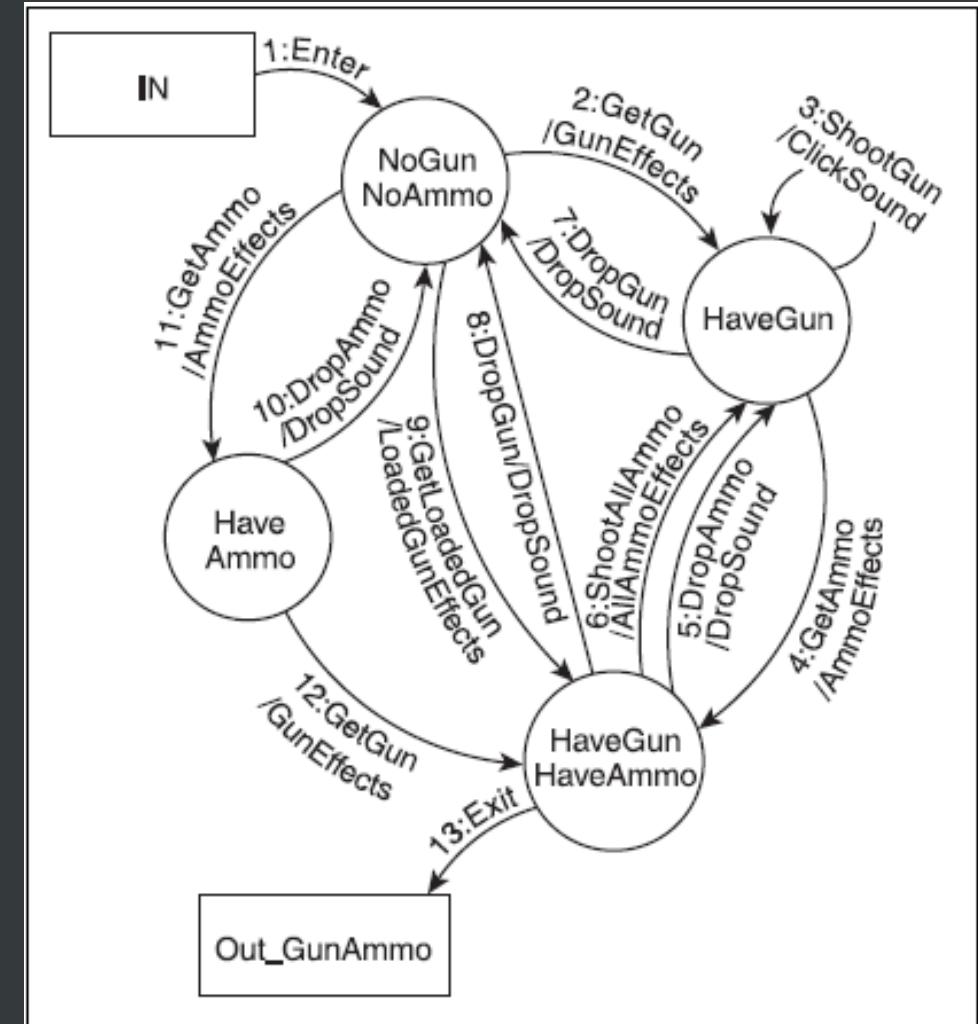
- Mode-based usage
- Player-type usage

Auto-Center	Casual	Achiever	Explorer	Multiplayer
Yes	30	0	20	10
No	70	100	80	90
TOTAL	100	100	100	100

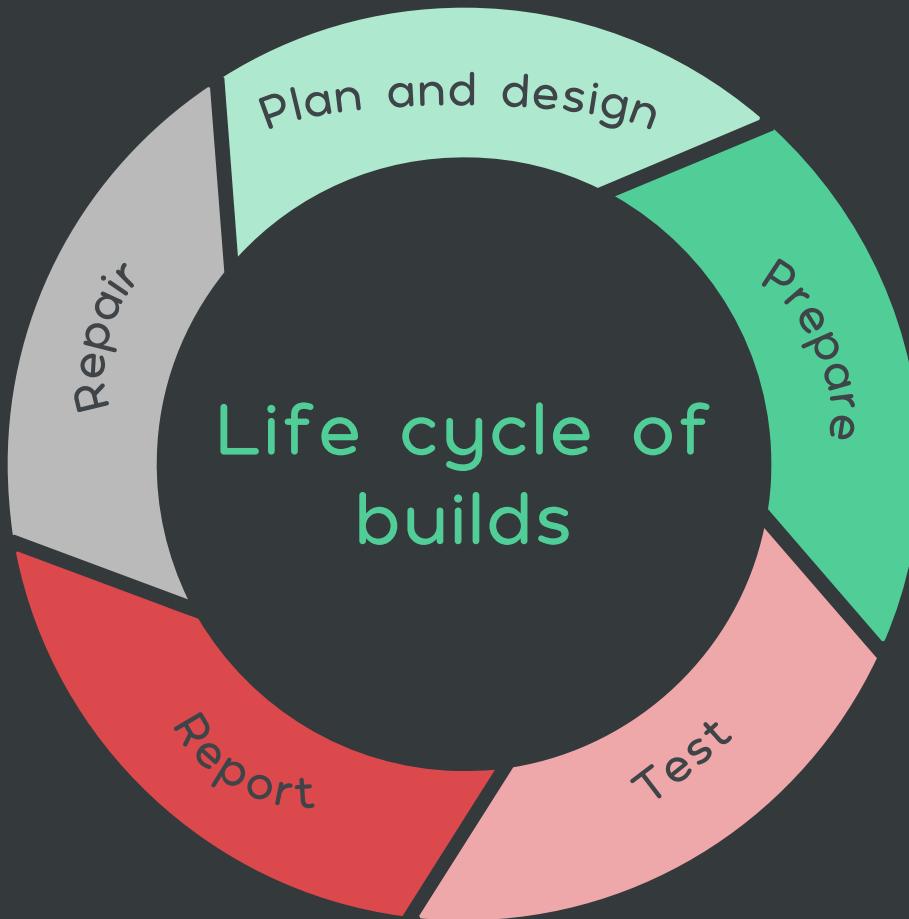
Test	Look Sensitivity	Invert Thumbstick	Controller Vibration	Invert Flight Control	Auto-Center
1	3	NO	YES	YES	YES
2	3	NO	YES	YES	NO
3	3	YES	YES	NO	YES
4	3	NO	NO	NO	YES
5	3	NO	YES	NO	NO
6	10	NO	YES	NO	YES

► GAME TESTING: Types of game testing (cont.) [1]

Test flow diagram

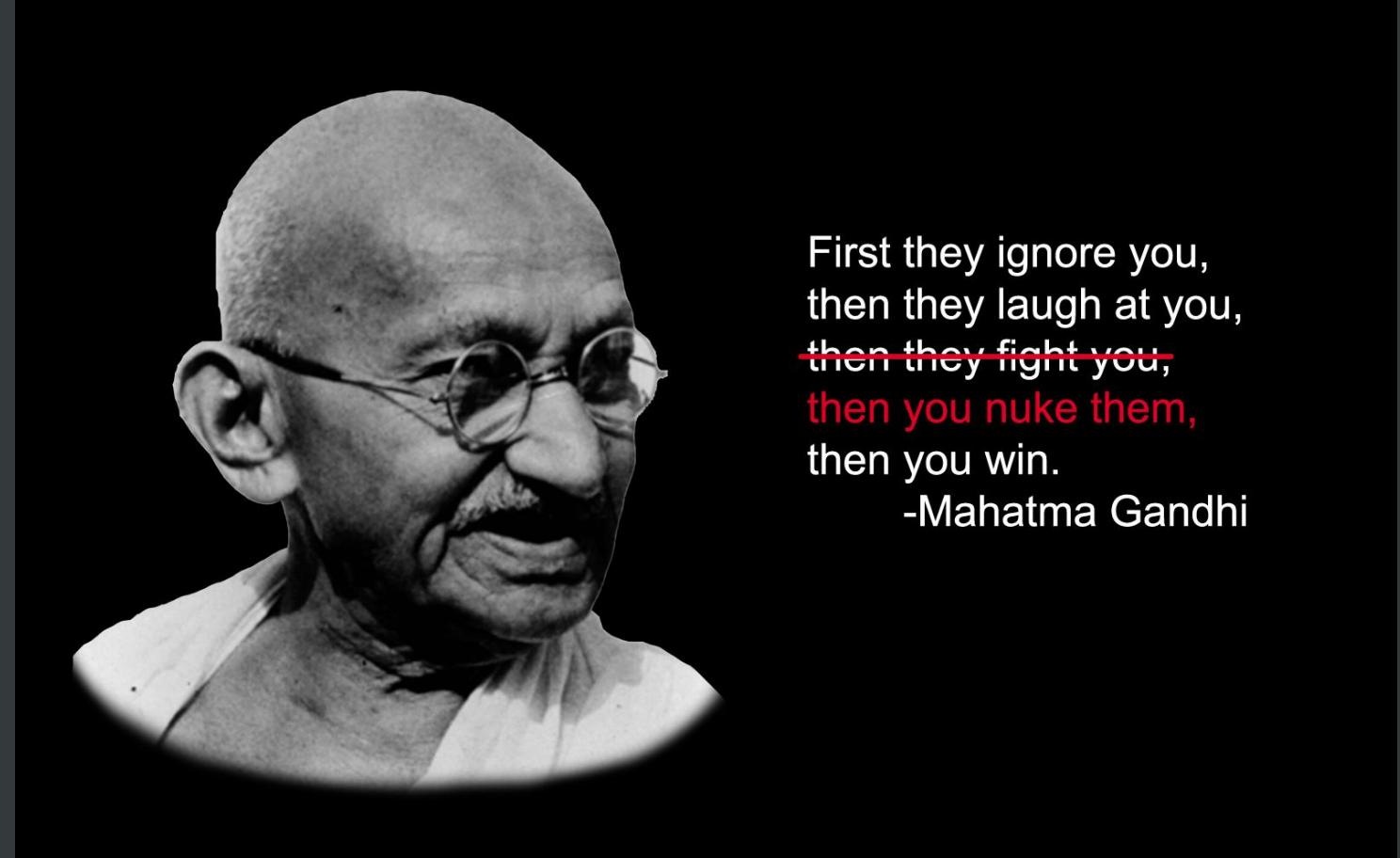


► GAME TESTING: The test process [1]



► SECRET STAGE: A famous glitch

Nuclear Gandhi



First they ignore you,
then they laugh at you,
~~then they fight you,~~
then you nuke them,
then you win.

-Mahatma Gandhi

INTRODUCTION

GAME TESTING

STAGE 2

AUTOMATION



- What to automate
- Automation techniques
- Tools

► AUTOMATION: What to automate [1]

UI interactions
Customizers
Settings



► AUTOMATION: What to automate (cont.) [1]

Load and stress testing

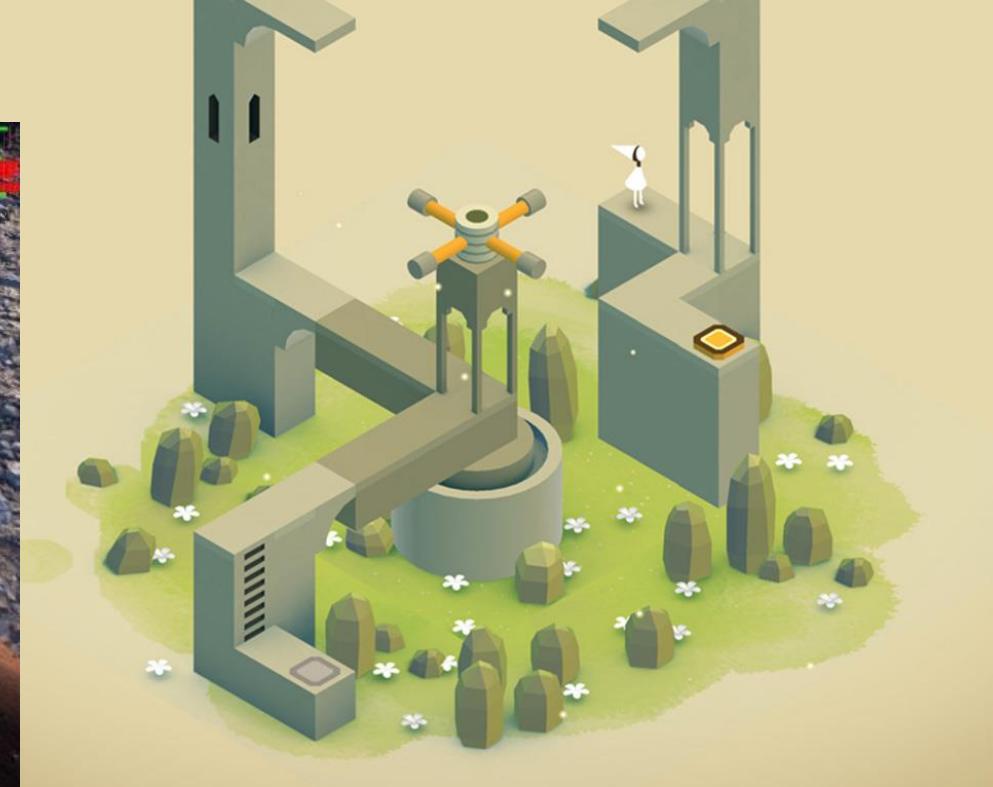
Multiplayer testing



► AUTOMATION: What to automate (cont.)

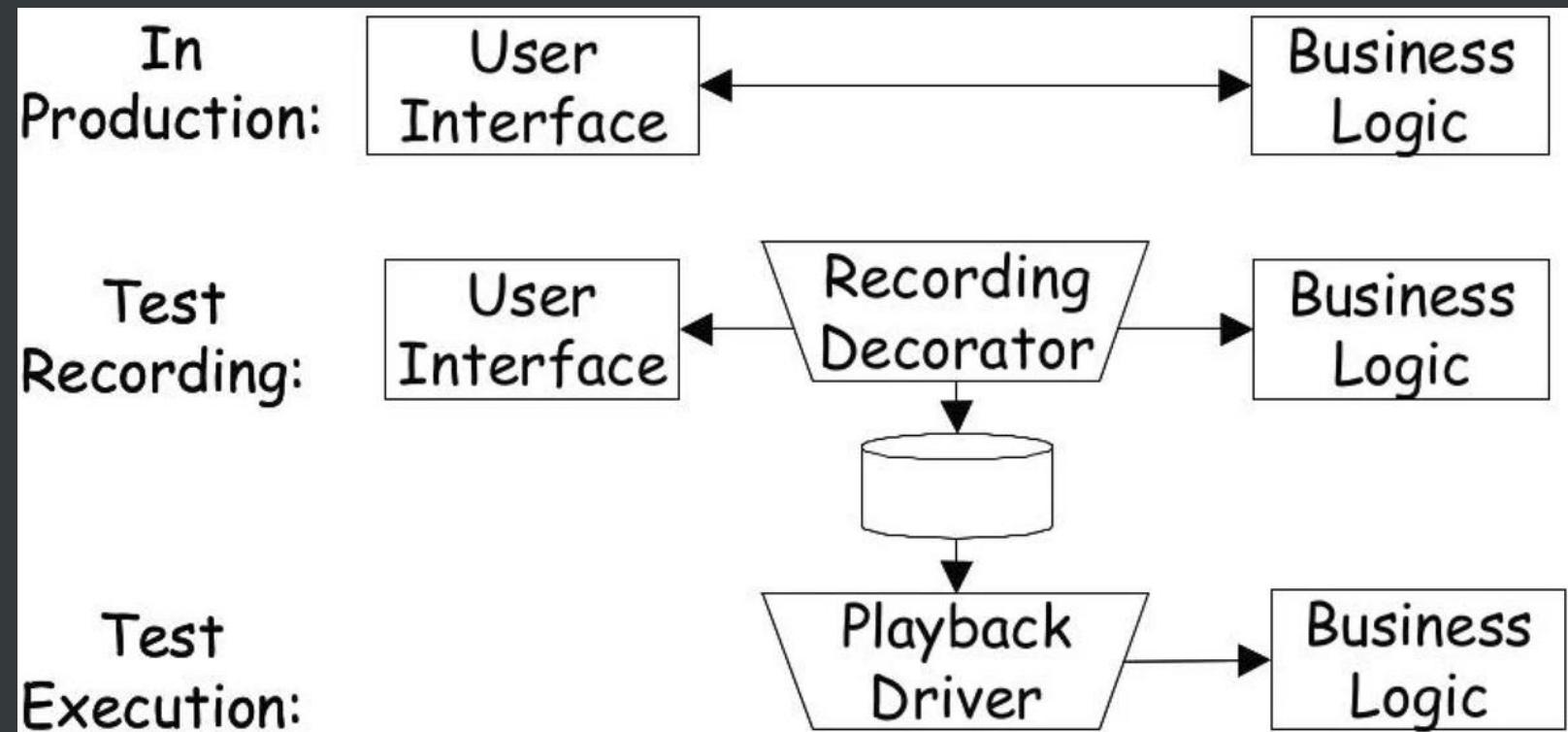
Puzzles

Clipping and collision testing



► AUTOMATION: Automation techniques [1][5]

Capture/Playback testing



► AUTOMATION: Automation techniques [4]

Regression testing

1. Smoke and sanity testing
2. Requirements analysis
3. Identifying critical test cases
4. Test case selection

► AUTOMATION: Automation techniques

Events and triggers

Startup trigger

Exception triggers

Stress triggers

Restart triggers

Progress triggers

Purchase triggers

► AUTOMATION: Automation techniques

AI and CV

Intelligent play testing

- Can detect render problems

- Can find no-collision walls

- Can play thousands of levels

- Can purposefully break the game

Intelligent reports

- Identify useless features

- Finds best control layout

► AUTOMATION: Tools

Engine tools

AltUnity

Unreal's Automation driver

GameAnalytics

GameDriver.io

INTRODUCTION

GAME TESTING

AUTOMATION

BOSS STAGE

CHALLENGES



- Testing the untestable
- Different controls
- Different people
- Different platforms
- Game testing is not a game

► CHALLENGES: Testing the untestable

Renders
Sounds
Feels



► CHALLENGES: Different controls

Touch
Motion
Steering wheel
Analog vs digital
Microphone



► CHALLENGES: Different people

Disabilities

Vision

Hearing

Mental

Physical



►CHALLENGES: Different people

Age
Phobias



► CHALLENGES: Different platforms

Android

iOS

Switch

PC

Xbox

PlayStation

VR



► CHALLENGES: Game testing is not a game

Permutations

Time to finish

Levels

Time-based triggers

Balance

You really think testers actually test
the game? Think mark! think



► CONCLUSION



Games are not just softwares,
they're immersive experience.

► CONCLUSION [6]

Rotating the screen	
Check that rotating the device works on all game stage, on all screens	Passed
Check that rotation is carried out smoothly	Passed
Check that Splash screen is displayed correctly in all device rotation	Failed
Check that rotation is carried out correctly on loading screens	Passed
Check rotation functionality if it turned off in device settings	Passed

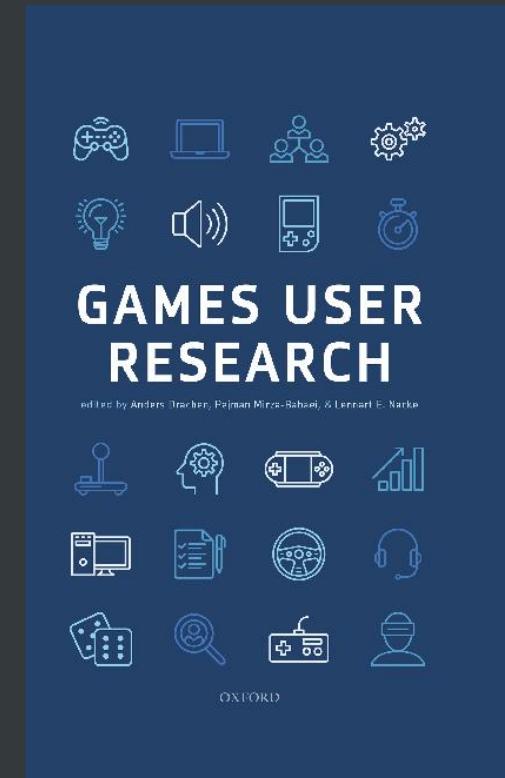
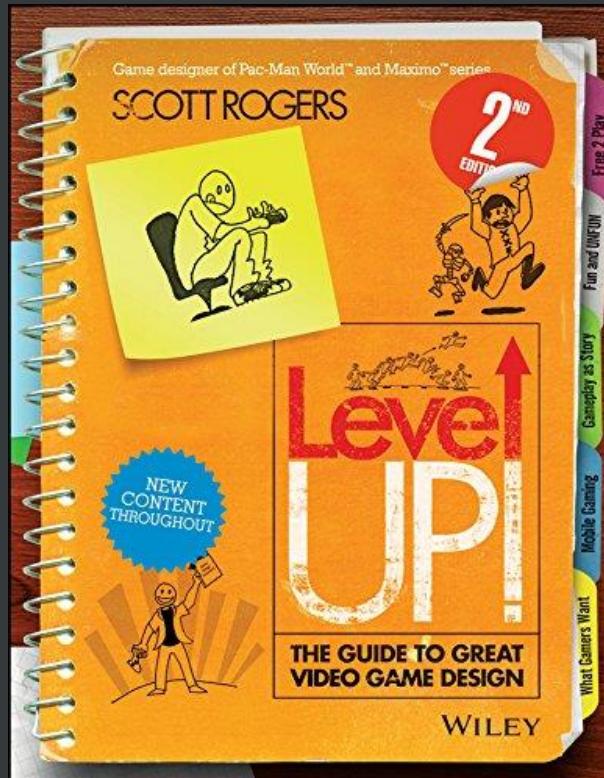
2	The map is not saved when you press the Power button and return to the game.	Major	Xiaomi MI3 Android 4.4.3	Steps to reproduce: 1. Run the application 2. Start playing the game 3. Open Map 4. Press the Power button 5. Press the Power button again 6. Continue playing the game Actual result: The map is not saved when you press the Power button and return to the game. Expected result: The map should be saved when you press the Power button and return to the game.
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► REFERENCES

- [1] Charles P. Schultz, Robert Bryant, Tim Langdell, 2005, Game Testing All in One, Mercury Learning and Information
- [2] Sánchez J.L.G., Zea N.P., Gutiérrez F.L. (2009) Playability: How to Identify the Player Experience in a Video Game
- [3] John Ferrara, 2011, The elements of player experience
- [4] iXie Gaming, 2017, Regression testing for a game software
- [5] MacKenzie, B. (2012). Top 10 mobile application testing automation tool requirements
- [6] QA Madness, 2015, Mobile game testing report

► DLC STAGE: Recommendations

- What Is Games ‘User Experience’ (UX) and How Does It Help?
- Graphical Glitch Detection in Video Games Using Convolutional Neural Networks





QUESTIONS

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THANKS, HAVE A GREAT TIME