

# Automate, Streamline, Win!

Creating custom workflows  
for content heavy games

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 Out of Bounds



GAME DEVELOPERS CONFERENCE™ EUROPE  
CONGRESS-CENTRUM OST KOELNMESSE · COLOGNE, GERMANY  
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THE  
ADVENTURES  
OF  
"Bertram  
Fiddle"



RUMPUS!

**Systems driven games are like a stew**



# Content driven games are like mosaics



**...and missing pieces stand out much more!**



# Tons of assets!

1227(ish) lines of dialogue

2899 sprites

603 animations

39 scenes

1608 audio files

53 characters

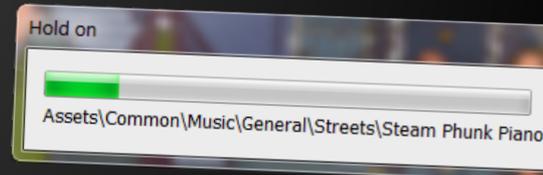
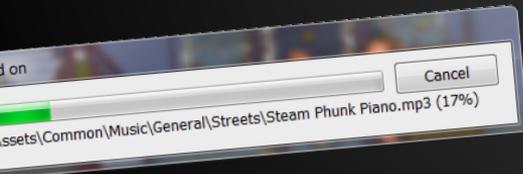
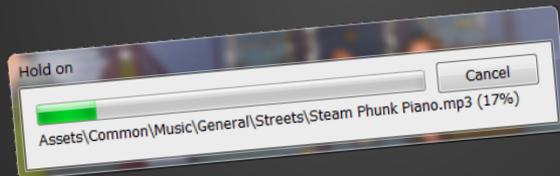
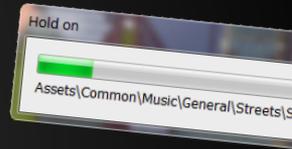
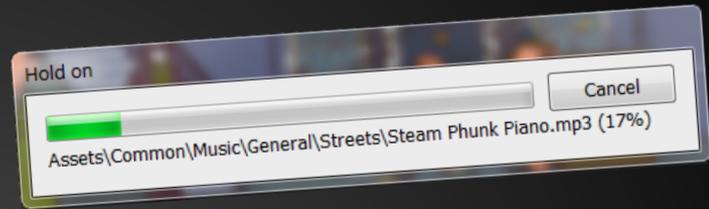
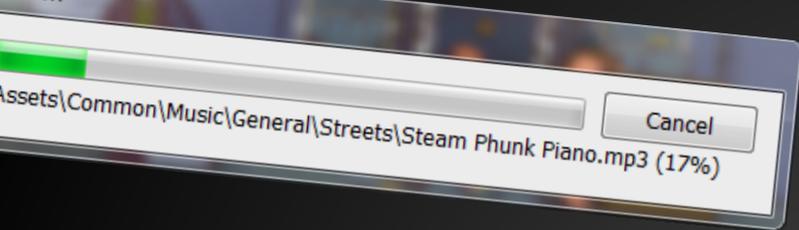
# Principle #1

Automate - Brain waves are precious  
so don't waste them

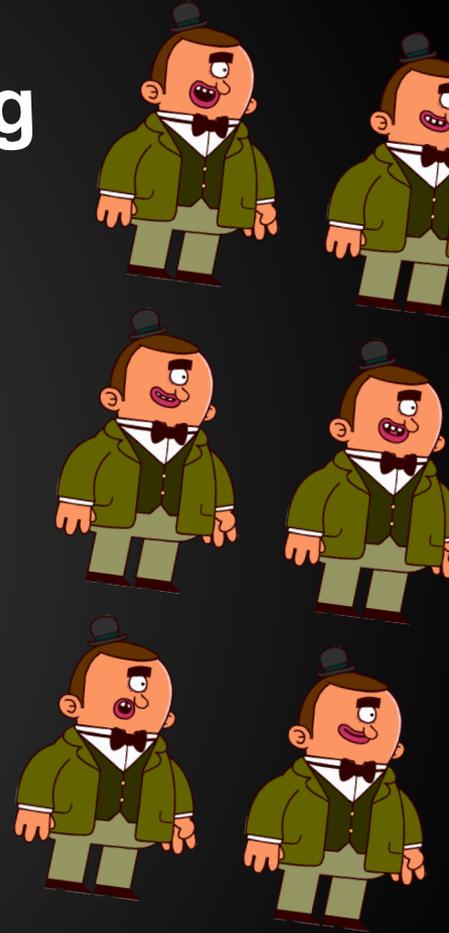
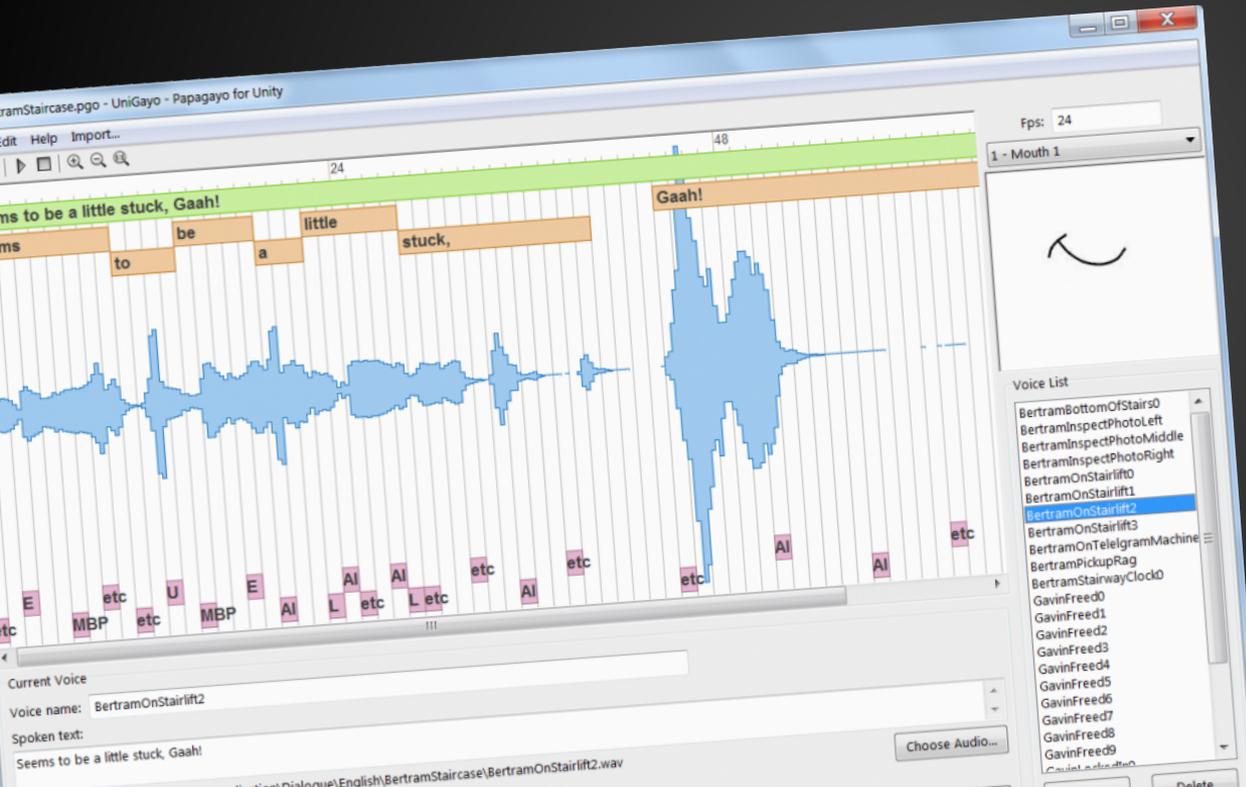
brain... waves?



# Unity Asset Importing



# UniGayo - Semi Automatic Lipsyncing



RavishamStaircase.pgo - UniGayo - Papagayo for Unity

File Edit Help Import...

Look out Mir. Fiddle

Look out Mir. Fiddle

Fps: 24

1 - Mouth 1

U etc AI etc AI AI etc L

L etc O MBP etc FV etc L

Current Voice

Voice name: InspectHole1

Spoken text: Look out Mir. Fiddle

Audio path: ...1\Assets\Common\Localisation\Dialogue\English\RavishamStaircase\InspectHole1.wav

Choose Audio...

Phonetic breakdown: English Breakdown MOHO All Export...

Voice List

- ParrotAfterChestOpen1
- ParrotInAttic0
- ParrotInAttic1
- PickupBridgePicture
- PickupFootstool
- UseGavinPushBertram
- UseGavinVinePuzzle
- UseOarOnHole
- UseVineFail
- UseVineSuccess0
- InspectHole1

New Delete

Papagayo Stopped

# Automation used to locate missing work

1. What dialogue is still missing in the game?
2. What subtitles are too long to fit on the screen?
3. What lines have yet to be lipsynced?
4. What dialogue have we yet to use in the game?
5. Fix configuration bugs in puzzles

In short, it should not be work to figure out what work is left.

## Principle #2

If it can't be automated  
make the workflow a breeze!



# Our workflow



Story &  
Puzzles



Illustration &  
Animation



Music, SFX &  
Voice acting



Lipsyncing &  
Timing

# A story = sequence of events



# Storyline Tool

The image shows a software interface for a Storyline Tool, divided into two main panels: the Inspector and the Story Chain.

**Inspector Panel:**

- Script:** PlayAnimationStoryEvent
- Sprite To Animate:** ClockSprite (SpriteAnimator)
- Clip To Play:** UseClockStill
- Finish Immediately:**
- Duration:** 0.5
- Loop:**

**Story Chain Panel:**

Current Chain: GettingUpFromBed

Reload Chains

The Story Chain consists of 14 events, numbered 22 to 36:

- 22: PlaySound : SteepOutOfBed
- 23: Delay : 1.4 seconds
- 24: SetSpriteState : disable BertramGettingOutOfBed
- 25: SetInteractiveCharacter : NightgownBertram
- 26: ChangeInputState : Enable
- 27: TeleportCharacter : NightgownBertram to (1.7, -1.7)
- 28: IF InteractionCondition : UseCurtains
- 29: Dialogue : Bertram "BertramDarkness"
- 30: Hint : Activate HintShowInteractions
- 31: AllInteractionsHighlighted : No Description
- 32: InteractionClickState : UseCurtains - clickable
- 33: InteractionClickState : DummyUseCurtains - unclickable
- 34: Hint : Deactivate HintShowInteractions
- 35: InteractionClickState : UseCurtains - unclickable
- 36: TeleportCharacter : NightgownBertram to (5.9, -1.7)

At the bottom of the Story Chain panel is a button labeled "Add StoryEvent".

# Storyline Tool

The image shows a screenshot of the Storyline Tool interface. On the left is the Inspector panel, and on the right is the Story Chain panel.

**Inspector Panel:**

- Script: `ChangeInputStateStoryEvent`
- State:
- Affects GUI:

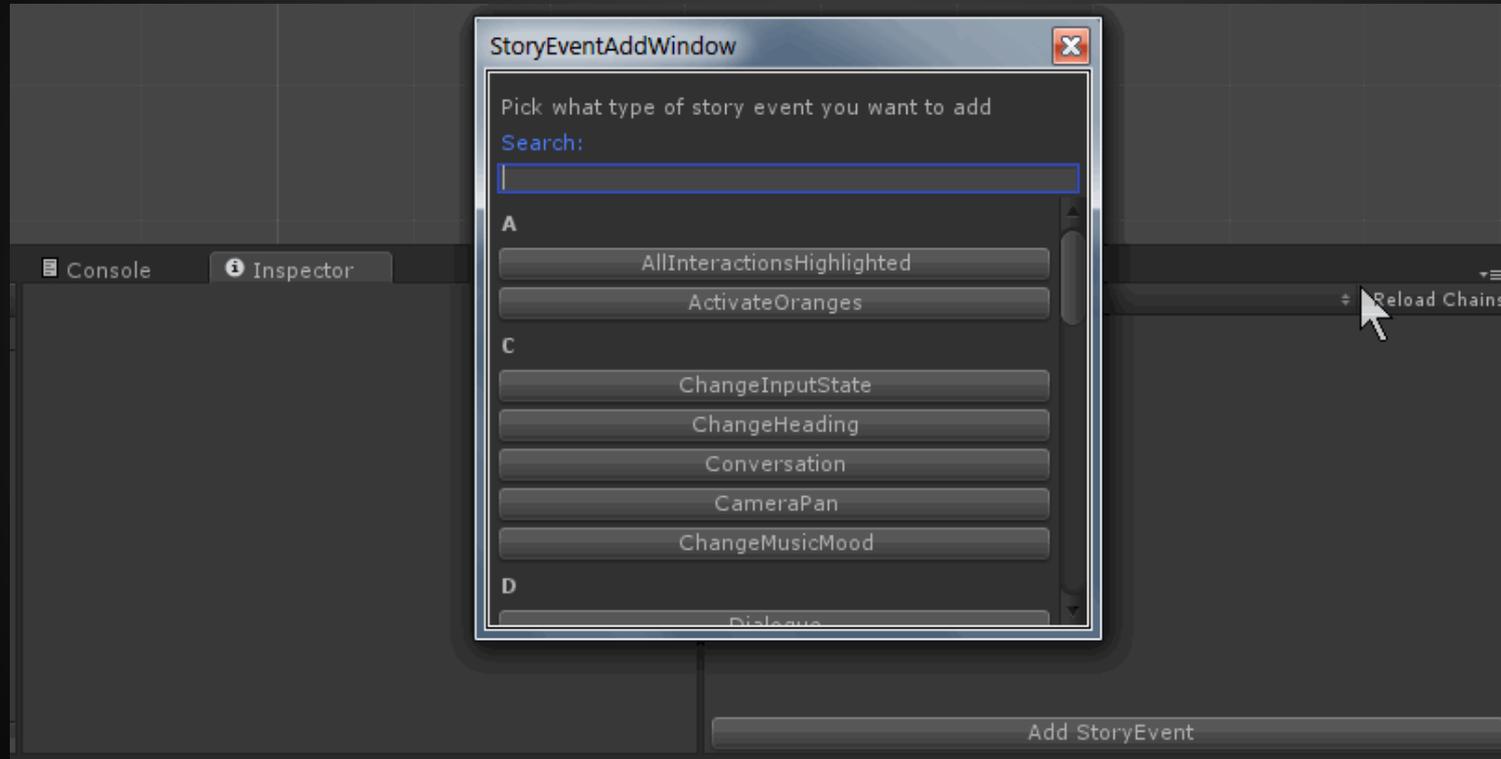
**Story Chain Panel:**

- Current Chain: GivingCrackerToParrot
- Reload Chains:
- Chain List (Index | Event Name | Action):
  - 0 | GivingCrackerToParrot | GiveHorn
  - 1 | SpeakToRavisham | ToParrot
  - 2 | PickUpGramophoneChain | not - unclickable
  - 3 | PickUpRing | not - clickable
  - 4 | GiveToken : FedParrot
  - 5 | TakeItem : Cracker
  - 6 | HasTokenCondition : GivenHorn
  - 7 | Walk : Bertram to (-1.0, -2.0)
  - 8 | Conversation : SpeakToParrot1
  - 9 | GiveToken : ChestCombination
- Bottom Button: Add StoryEvent

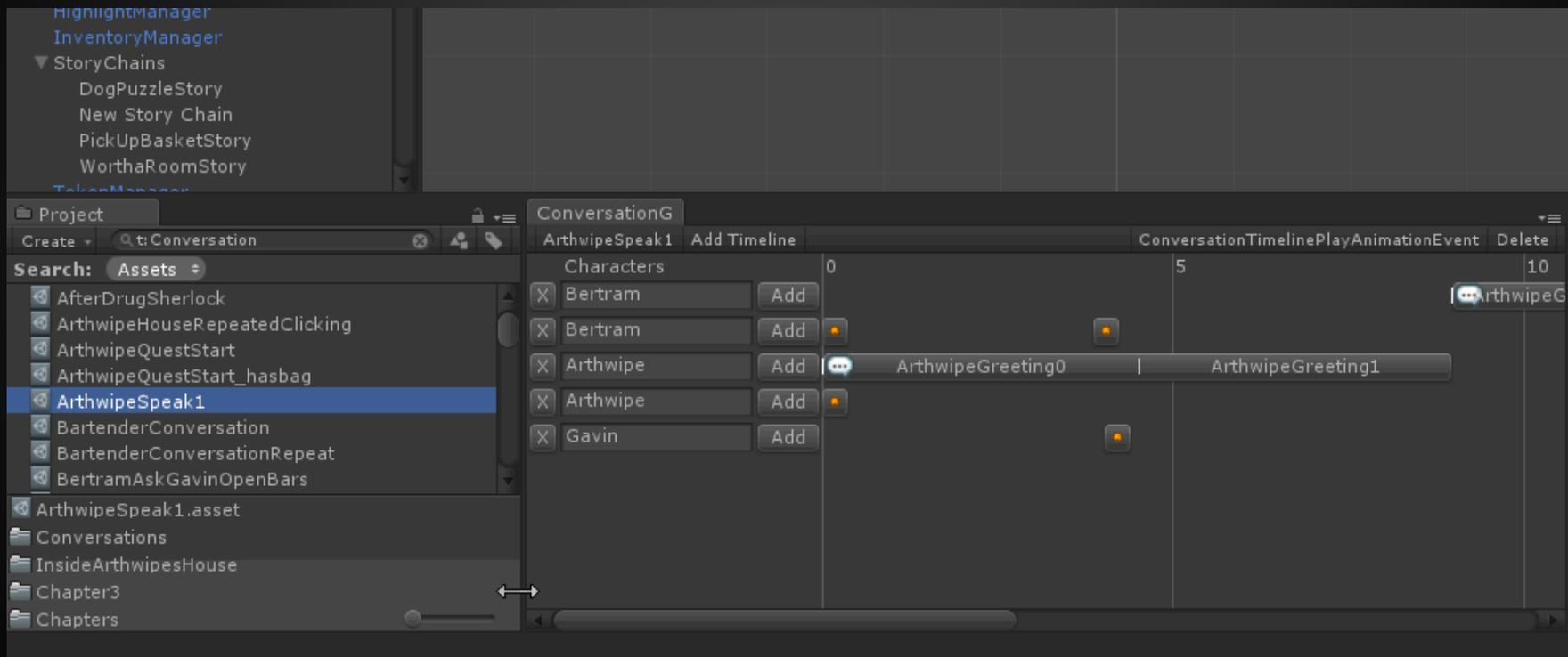
A context menu is open over the Story Chain list, showing the following options:

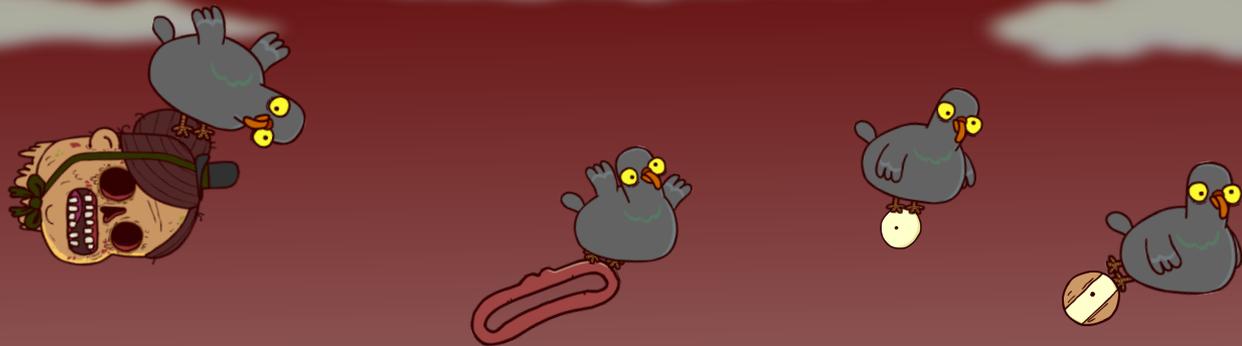
- GivingCrackerToParrot
- SpeakToRavisham
- PickUpGramophoneChain
- PickUpRing

# Storyline Tool



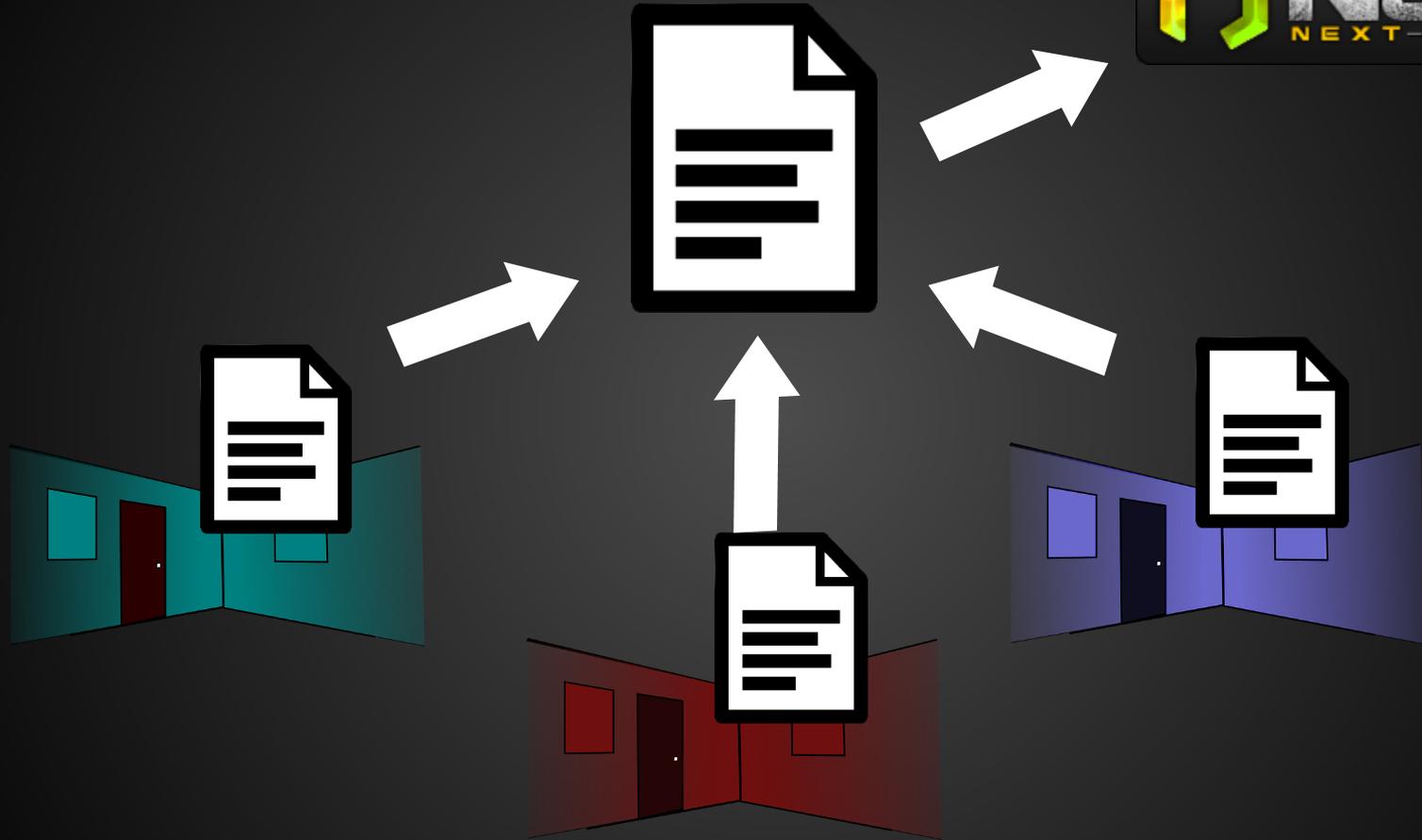
# Cutscene Tool



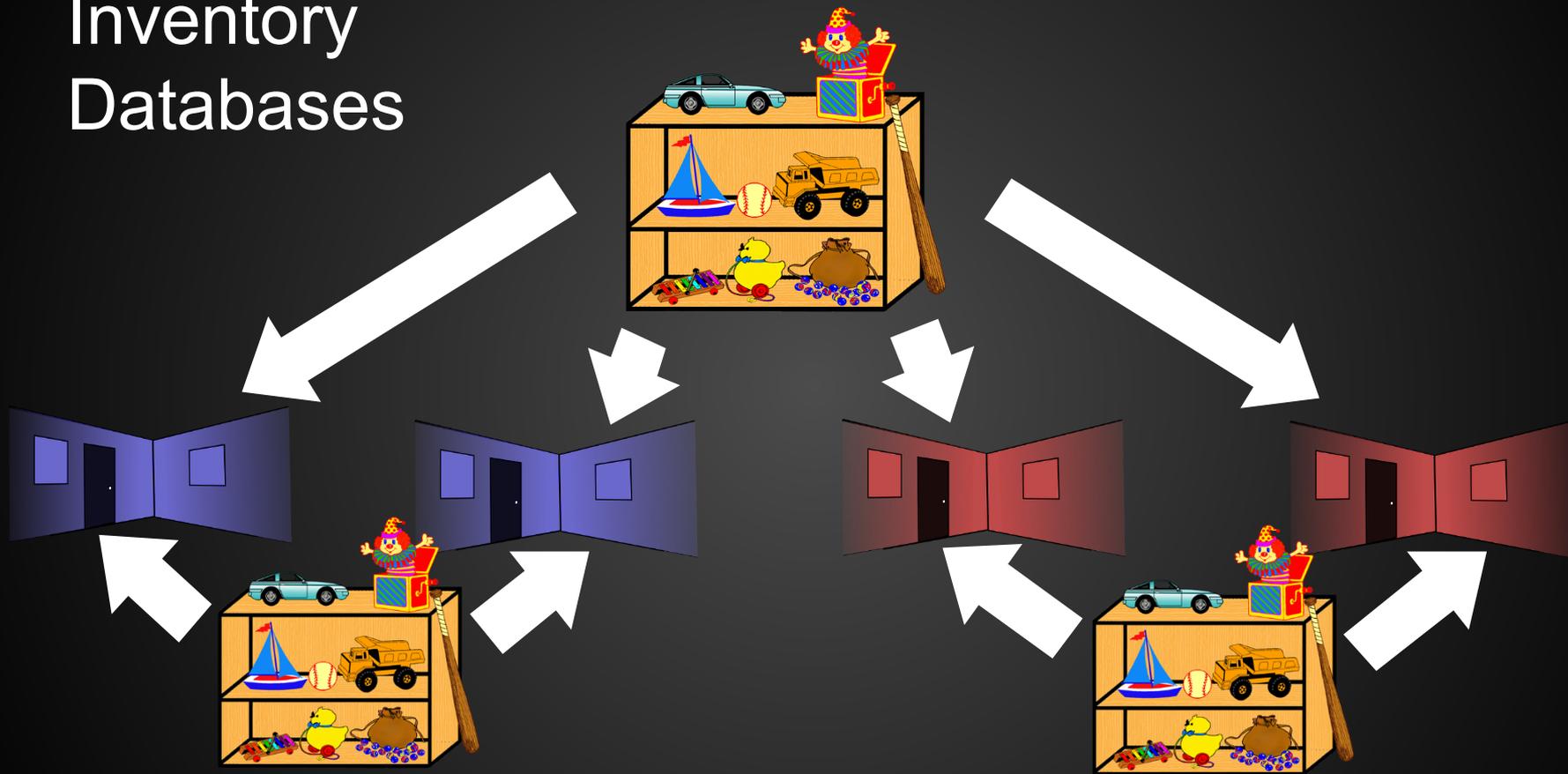


## Principle #3

Structure your files around the workflow that best suits your team



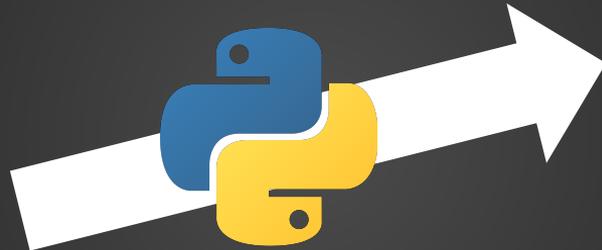
# Inventory Databases



# Importing external files



Dropbox



Python  
scripts



Git  
repository

## Principle #4

Great games are built on a ton of mistakes - create tools that let you find them fast!



# Visualise errors

The screenshot displays a game engine interface with a menu bar at the top: File, Edit, Assets, GameObject, Component, NGUI, Utilities, Bertram, Window, Help. Below the menu bar are navigation and pivot controls, including a hand icon, a crosshair, a refresh icon, a square icon, and buttons for Pivot and Local. The main interface is divided into three panels: Hierarchy, Story Chain, and Game/Animator.

The Hierarchy panel on the left shows a tree structure with the following items:

- Characters
- Interactions
  - ClickOnGlobeInteraction
  - EnterExclusiveHallway
  - GiveTeaToSherlock** (highlighted with a mouse cursor)
  - SherlockFirstTalk
  - SpeakToWatsonAfterDruggingHolmes
  - SpeakToWatsonAfterDruggingHolmesRepeat
  - SpeakToWatsonBeforeDruggingHolmes
  - TeacupInteraction
- LoopingClouds
- Main Camera
- Managers
- NavigationGraphs
- PanTriggers
- Scalezones
- Scenery

The Story Chain panel on the right shows a sequence of events for the current chain "SpeakToHolmes". The events are:

- 20 TakeItem : Rose
- 21 SetSpriteState : disable GeoffBag\_Head
- 22 SetSpriteState : enable GeoffBag\_Empty
- 23 GiveItem : DeadHead1
- 24 ChangeInputState : Enable
- 25 IF InteractionCondition : GiveTeaToSherlock
- 26 ChangeInputState : Disable
- 27 Walk : Bertram to (0.5, -2.1)
- 28 InteractionClickState : GiveTeaToSherlock - unclickable
- 29 InteractionClickState : SpeakToWatsonBeforeDruggingHolmes - unclickable
- 30 GiveToken : GivenTeaToHolmes
- 31 InteractionClickState : SpeakToWatsonAfterDruggingHolmes - clickable
- 32 Conversation : UseTeaOnSherlock

At the bottom of the Story Chain panel is a button labeled "Add StoryEvent".

# Visualise the state of the game



The image displays a game engine interface. On the left is a 2D scene of a character on a staircase. On the right is a state machine editor with 16 states and a 'Fast Forward' button.

**State Machine Editor:**

State	Event	Action	Icon
0	InteractionClickState : WalkUpstairs - unclickable		⊕
1	InteractionClickState : WalkDownStairs - unclickable		#
2	IF InteractionCondition : UseStairlift		IF
3	ChangeInputState : Disable		👤
4	Walk : Bertram to (2.9, -0.3)		👤
5	ChangeHeading : Bertram - W		🕒
6	Delay : 0.1 seconds		*
7	Dialogue : Bertram "BertramOnStairlift0"		💬
8	Delay : 0.5 seconds		*
9	SetSpriteState : enable BertramOnStairlift		👁
10	PlayAnimation : StairliftMoving StairliftFalling		▶
11	TeleportCharacter : Bertram to (6.6, -4.3)		🌈
12	PlayAnimation : BertramOnStairlift BertramGettingOnStai		▶
13	PlaySound : LiftSound		🔊
14	Delay : 1 seconds		*
15	CameraPan : No Description		📷

**Fast Forward**

# Be able to change the speed of time



# Fast Forwarding

Free Aspect    Maximize on Play    Stats    Gizmos

Current Chain: PickupBasketStory    Reload Chains

0 InteractionCondition : PickupBasketInteraction

1 ChangeInputState : Disable

2 Walk : Bertram to (-0.7, -2.0)

3 ChangeHeading : Bertram - W

4 yCharacterAnimation : Bertram BertramPickingU

5 Delay : 1 seconds

6 SetSpriteState : disable dog\_basket

7 Delay : 1.2 seconds

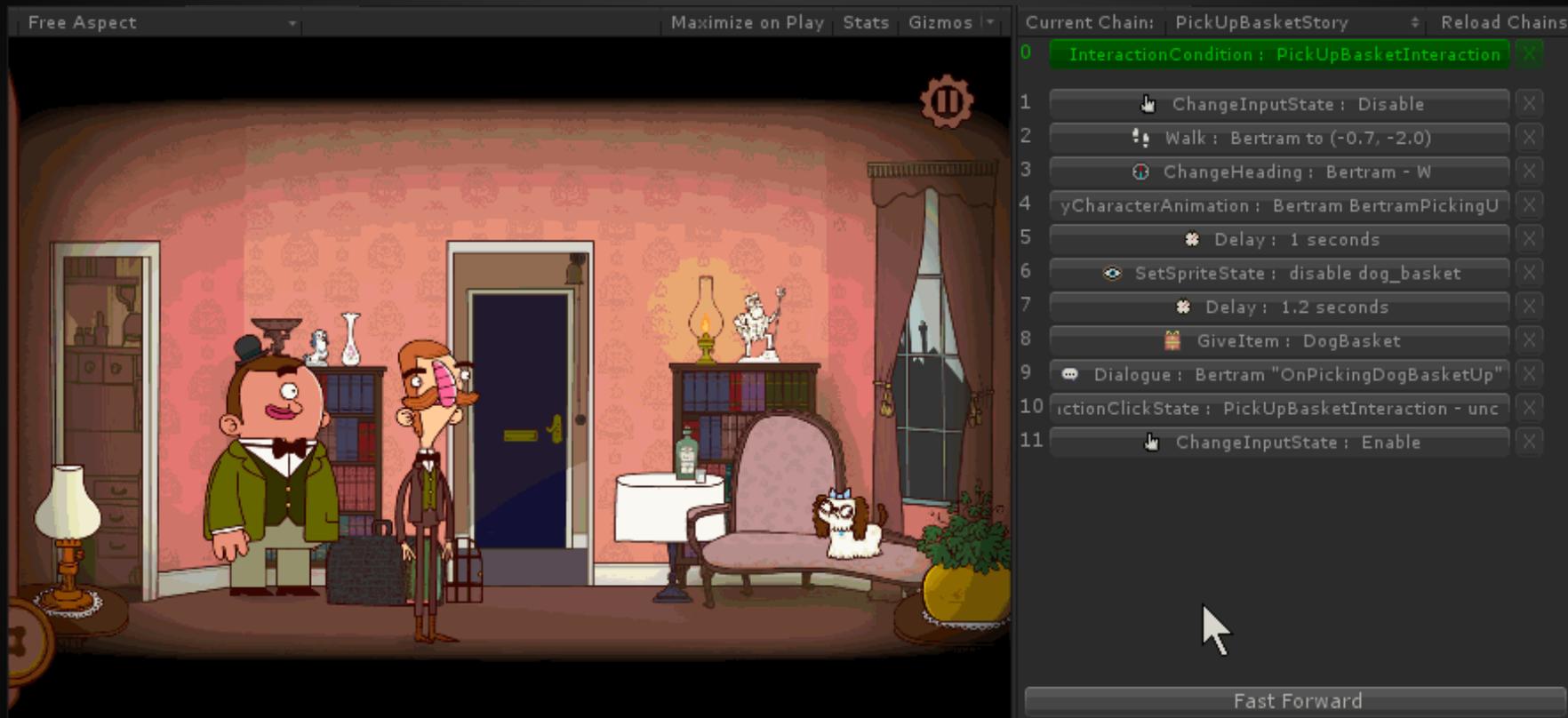
8 GiveItem : DogBasket

9 Dialogue : Bertram "OnPickingDogBasketUp"

10 ictionClickState : PickupBasketInteraction - unc

11 ChangeInputState : Enable

Fast Forward



The image shows a game engine interface. On the left is a 2D cartoon scene of a room with two characters, a dog on a chair, and various furniture. On the right is a sequence editor with a list of actions and a 'Fast Forward' button at the bottom.

# Principle #5

Tools & workflow won't fix everything



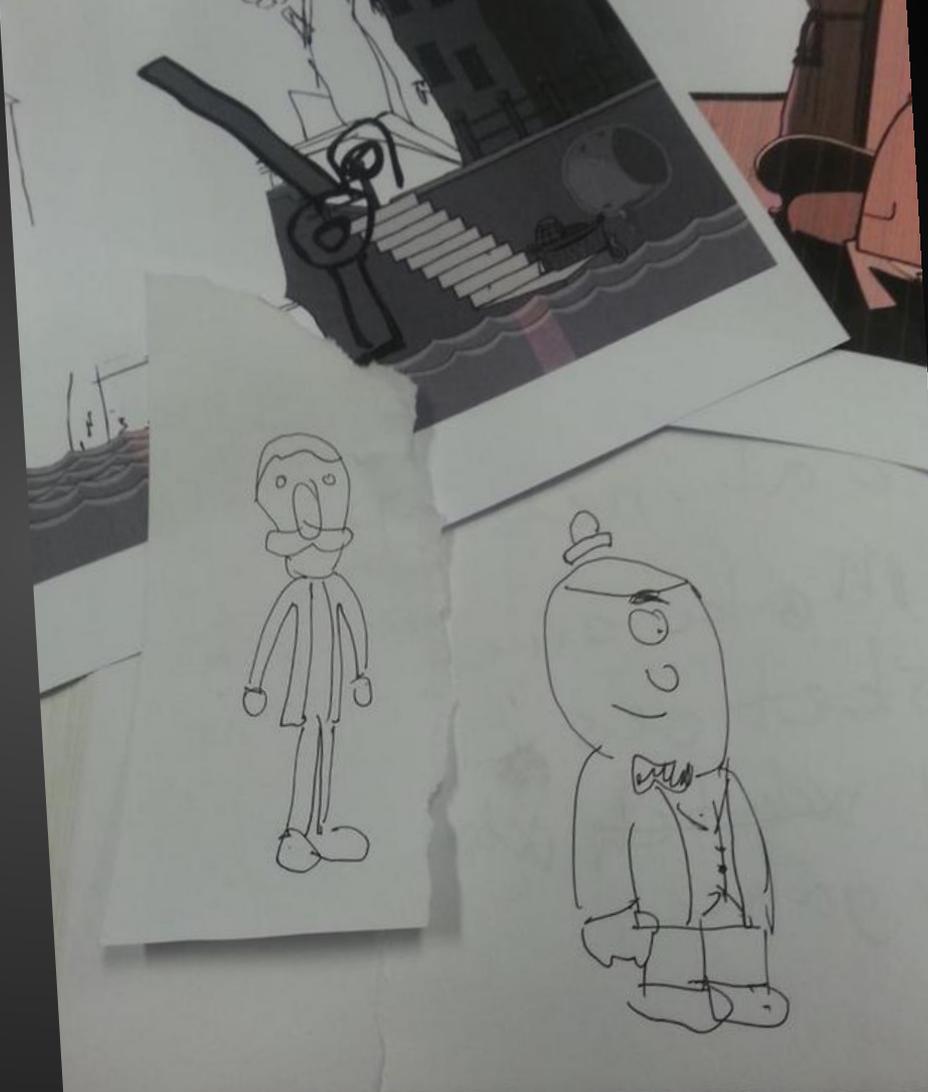
Gavin, when did we decide to cut this from the game?!?

# Design Documents: What...`

- happens when you enter the scene?
- can you interact with?
- puzzles?
- scenes can you go to?
- items do you pick up?

# Paper Prototyping

Fast, flexible  
and cheap



# Start with placeholder Assets



Who needs pretty art anyways?

# Wrapping up

1. Automate everything that can be automated
2. Make your workflow juicy and effortless
3. Organize your files so it makes sense for you team
4. Make it easy to spot mistakes
5. Remember that technology don't solve everything

# Thank you!



@AlexanderBirke  
outofboundsgames.com



@BertramFiddle  
bertramfiddle.com

**Deleted** ~~**Slides**  
**Scenes**~~

# The future!

How will we make games 10 years from  
now?

# Collaborative realtime editing

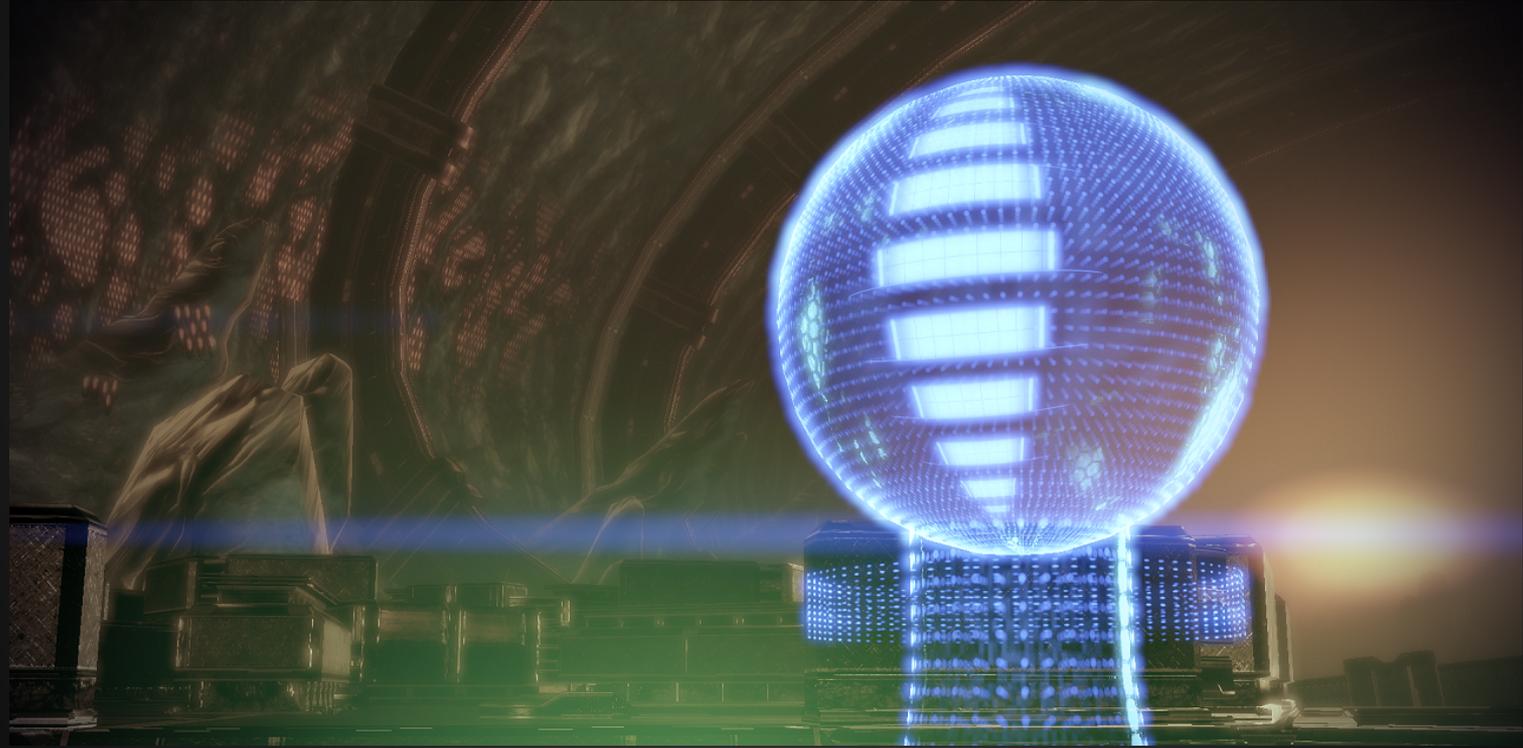
The screenshot displays the 'Public Pad' interface. At the top, there are navigation links: 'Public Pad', 'Read-only Version', 'Pad Options', 'Import/Export', 'Saved revisions', 'Time Slider', and 'Home'. Below this is a rich text editor toolbar with icons for bold, italic, underline, strikethrough, bulleted list, numbered list, indent, link, unlink, image, video, and a copyright symbol. To the right of the toolbar are icons for undo, redo, and a zoom dropdown set to 100%. The main editing area contains the following text:

1 **Game Mechanics**  
2 • moving left and right  
3 • jump  
4 • Collect coins  
5 • eat mushroom to gain the ability to take extra hit (what if you also get bigger to show it?)  
6  
7 **Visuals**  
8 • Player character is a plumber  
9 • Coins hidden in boxes  
10

On the right side, there is a chat window with a header 'Mario' and a list of participants: 'Mario' (highlighted in light blue) and 'Toad' (highlighted in light green). Below the chat list is a 'Share this pad' button. At the bottom of the chat window, a date separator reads 'January 24, 2015'. The chat log contains the following messages:

- Mario: Hey would it not be totally awesome if the princess is just like in this castle? 20:37
- Toad: would it not make the game too short? 20:37

# AI assisted development



# Automatic Audio Normalization with sox

```
$ sox track1.wav track1-processed.flac remix - norm -3 highpass 22
gain -3 rate 48k norm -3 dither

Input File      : 'track1.wav'
Channels        : 2
Sample Rate     : 44100
Precision       : 16-bit
Duration        : 00:02:54.97 = 7716324 samples = 13123 CDDA sectors
Sample Encoding: 16-bit Signed Integer PCM
Endian Type     : little

Output File     : 'track1-processed.flac'
Channels        : 1
Sample Rate     : 48000
Precision       : 16-bit
Duration        : 00:02:54.97 = 8398720 samples ~ 13123 CDDA sectors
Sample Encoding: 16-bit FLAC

sox: effects chain: input      44100Hz 2 channels 16 bits (multi)
sox: effects chain: remix     44100Hz 2 channels 16 bits (multi)
sox: effects chain: norm      44100Hz 1 channels 16 bits
sox: effects chain: highpass  44100Hz 1 channels 16 bits
sox: effects chain: gain      44100Hz 1 channels 16 bits (multi)
sox: effects chain: rate      44100Hz 1 channels 16 bits
sox: effects chain: norm      48000Hz 1 channels 16 bits
sox: effects chain: dither    48000Hz 1 channels 16 bits
sox: effects chain: output    48000Hz 1 channels 16 bits (multi)

$ play *.ogg

01 - Summer's Cauldron.ogg:

Encoding: Vorbis
Channels: 2 @ 16-bit   Track: 01 of 15
Samplerate: 44100Hz   Album: Skylarking
Album gain: -7.8dB    Artist: XTC
Duration: 00:03:19.99 Title: Summer's Cauldron

In:20.8% 00:00:41.61 [00:02:38.38] Out:1.84M [ ====|==== ] Clip:0
```