Game Design Document

based on **DOI:** 10.1109/CGames.2012.6314556

Date: 28.06.2021 (ver 0.4)
Name of the Game: Clean it Up!
Name of the Student: Viacheslav Romanov
Tutorial: 2
Link to the game repository: https://github.com/davinel000/cleanitup
Link to the scene: Assets/Scenes/SampleScene.unity

Table of content

0 Updates

28.06.2022

- Implemented animation of character using the Animator component (walking in 4 directions):
    - Depending on a direction of movement the AC component decides on which animation should be used to animate the character (Idle/Walking, Up/Down/Right/Left)
- Implemented animation for UI (Highlighting elements of Objectives section, Inventory appearance, dialogue appearance)
- Implemented cutscene effect (camera change, camera shaking when the call comes)
- Updated GDD (2.5D -> 2D game)
- Added sounds

21.06.2022:

- Implementation of an NPC character (Sis calling on the PC, answering the requests of a character)
- Dialog with an NPC during interaction with a PC (for getting a reward), communication with NPC during the quest
- Objectives implementation (answering the phone, collecting and applying the objects, as well as leaving the scene)
- Informing player about quest activation and completion.
- Shortcuts (“press b for banana”)

07.06.2022

- Implementation of basic game and player stats (Mood, Energy, Time)
- Implementation of time-based events
- Point-and-click navigation
- Inventory system
- Object interactivity

1 Overview

Clean it up is a 2D third-person point-and-click apartment-cleaning simulation game. The game's short slogan: Clean it up and celebrate! The aim of the game is to help the main character to tidy up his living room on the eve of his birthday, without forgetting to work, study, perform various daily tasks and keep his condition in order.

To do this, the player controls the character - a typical university student whose schedule is filled with to-do's, challenges. The seemingly simple task of cleaning a flat is in reality complicated by the constant need to be distracted by other important matters, as well as the character's fickle moods and fatigue. The game is limited to six days on the eve of your birthday, and the holiday is inexorably approaching.

The game is developed for the PC Windows platform using the Unity 3D development environment as part of the University of Bremen's Entertainment Computing course.

The game is intended for a single player and consists of chapters united by a common plot. It is designed in rough hand drawn aesthetics of a minimalistic casual game, accompanied by a short story inspired by real-life events and addressing the common personal experience of the unloved process of cleaning.

1.1 Game abstract

1.2 Objectives to be achieved by the game

Stay healthy and in good mood during the final 6 days of extreme survival - studying, maintaining relationships, working the dream out, cleaning the room before birthday. The 6 game days (Monday to Saturday) take a maximum of 144 minutes of real time, but most of the player's actions consume this time, leaving no time for reflection. By completing game quests, the player develops, increasing their chances of successfully completing the game. Fully or partially cleaned room in the end of Saturday days means a successful completion of the game and is taken into account when calculating the game result.

1.3 Core gameplay

The character navigates in a 2D pseudo-persperctive playing field, consisting of one's rented apartment. Charecter moves on click, interacts with the environment,

participates dialogues, drags and drops objects, uses inventory to fulfill the game objectives. Each significant move or interaction shortens the available time of the game. In-game system of physical and emotional states, as well as work tasks, change the ability of the character and the effects of completing quests.

1.4 Game features

1.4.1 Genre

The game is a third-person real-time point-and-click quest with simulator mechanics in a 2D space of the imaginary apartment.

The main character has a set of in-game characteristics (mood, energy, work-to-do, movement speed, inventory size), which change depending on game time, interaction with in-game items and game quest execution. In this way, a simulation of a real-life situation is achieved.

As the game progresses through the storyline, achieving the scores of completed quests, the player receives achievements that expand his playing abilities and chances of achieving a higher result. The game includes fixed events that require reactions, are tied to the game time and fulfil a narrative role.

During the game the character interacts with NPCs, receiving quests from them. The player can use the inventory to accumulate and use in-game items.

1.4.2 Number of players

The game is designed for one player. The game has a score indicator and High Scores at the end of the game as a way of determining the success and completeness of the game objectives, as well as the best game strategy. All quests are done by the player.

1.4.3 Game theme

The game's reality is a minimalist and roughly, 'hand-drawn' space of a rented flat in which the main game character resides. By simulating the processes of cleaning as well as work, study and various daily tasks, the game recreates the everyday world of the student, in which the everyday story unfolds and internal experiences are played out. The sloppy depiction of the game world and character harkens back to gameplay design methods of paper prototyping

Lack of time and the need to constantly rush and optimise efforts to get everything done lays down a dynamic in the game that requires the player to react quickly, prioritise and concentrate. With real-time mechanics at its core, the game inherits elements of turn-based strategies and RPGs, as the player's actions reduce the time available.

1.4.4 Story summary

We know a little about the backstory of the game space in which the player is placed. It is a rented flat of an ordinary modern student in a state of some decay, littered with junk - empty bottles, dirty dishes, tangled wires, covered with dust, with unwashed windows, and a dusty carpet. The flat obviously needs cleaning, and it is unclear whether the previous party, the owner's busy schedule or just plain laziness has put it in such a state.

The game focuses on the elements of the room, revealing through them the character's motivation and the individual elements of his story. Reality outside the flat is not shown, but exists, reminding one of tasks to escape to study, work, shop or to talk to a disgruntled neighbour.

As he performs the tasks, the character gets tired and it becomes harder for him to move on. He can lie on the couch to take a break, play a musical instrument to cheer him up, to work more to get rid of the ever growing list of cases, have time to vacuum the carpet and at the end of another day to collapse from exhaustion in the hope that the holiday in the sparkling shine of cleanliness flat, can fully enjoy (the main thing do not forget to invite friends).

The game scenario is packed with tasks and events that an average citizen of a metropolis encounters when he or she is at home: making work and personal calls, watching movies and reading the news. The aim of the game is to dissolve the player into the character's experience, to find common traits worthy of approval and criticism, to evoke empathy, and to reveal one's own individuality in the game strategy.

2 Mechanics

2.1 Game elements categories

Main Character (a Working student)

The main character in the game is an abstract and crudely drawn young man who wakes up in the middle of a messy flat and, upon coming to his senses, remembers that he is a student, in a bad mood, has a lot to do, and has a birthday coming up.

The character moves around the room-limited playing field, at the direction of the player's cursor. He interacts with objects, can move them from place to place. In some cases, the player can send the character to a non-game area - outside the flat - to perform individual quests.

The character has dynamically changeable characteristics that affect the effect of completing tasks.

By completing flat cleaning tasks, the character acquires additional skills that expand his or her abilities and facilitate user interaction.

Rubbish (Game item)
Clearing the flat of rubbish is one of the player's key objectives. Rubbish is items scattered around the game space - bottles, empty packages, scraps of dust, broken electronics - that need to be disposed of. Rubbish can be picked up when it is in the player's reach, is capable of blocking individual game elements, takes up space in the inventory, and is moved from place to place by the player. Rubbish can be placed in the bin to optimise the cleaning process. Interacting with trash is part of the quest and affects player characteristics.

Items (Game Item)
Items possessed by the character are scattered around the flat, but each has its own place to which it must be returned in order to restore order. The way to interact with them is the same as with trash - they take up space in the inventory, are an element of quests and affect the player's characteristics. Things can also be combined with other in-game items, for example, a rag can be used to wipe the floor or wash a window; several trash items can be placed in the bin.

Containers (Gaming item)
Locations on the map into which in-game items are placed when they are moved (cupboards, shelves, etc.).

Power-ups (In-game item)

Food, energy drinks, alcohol and other items can affect player's characteristics, increasing/decreasing/blocking them for a while. Allow more successful completion of resource-intensive tasks.

Interfaces (Game Object)
Interfaces are interactive elements that open up as quests are completed, expanding the player's capabilities. These include the desktop computer, synthesiser, guitar and projector - their "unlocking" from debris or setting up takes game time, but later allow them to be used to complete quests or improve the character's characteristics. Different objects can become interfaces, for example, after the carpet is cleaned you can lie on it and regenerate your strength.

Clock (Global Time)
A clock is an element of the game UI that reproduces the game's time. The time of day affects the player's characteristics. In fixed time slots, events which require timely, mandatory or optional reactions from the player take place.
Directing the player's character to perform small (pick up a dirty plate) or large (go to university) actions increases the time on the clock accordingly.

Game Resources
Time (T)
The game time is 6 days of 1340 minutes each. 1 game day takes 24 real minutes if the player does not undertake any activity. Time is additionally consumed when moving the character and performing in-game activities involving interaction with items. Not consumed when reading item descriptions.

Energy (E)
Maximal value is 100 points, 5 segments. Determines a character's ability to effectively complete tasks and interact with items. The higher the energy, the higher (within a certain range) the character's speed, and the less time it takes to complete in-game tasks. The outermost segments (1 and 5) are bonus or penalty segments, respectively.
Replenished by sleeping, resting, performing other enjoyable activities, and using Power-ups.
When energy expires, the character loses consciousness and recovers some energy, expending a resource of game time.

Mood (M)
Maxes out at 100 points, 5 segments. Determines the amount of points the player gets from completing tasks. Affects how quickly a character regenerates energy. Decreases while completing in-game quests, as well as depending on the in-game time of day.
Replenished by sleeping, resting, performing other pleasant activities, as well as by using Power-ups.
The outermost segments (1 and 5) are bonus or penalty segments respectively.
When the mood parameter is fully expired, the character loses the ability to interact with individual game items.

Work-to-do (W)
Maxes out at 100 points, 5 segments. Determines the amount of tasks the character needs to do - by completing one-off/day/repetitive tasks (work, study, socializing) as well as in-game quests. Slowly increasing over the course of the day, increasing at certain intervals when quests appear. When the maximum value of the parameter is reached, individual item interactions (e.g. entertainment) become inaccessible to the player.
The outermost segments (1 and 5) are penalty or bonus, respectively.

Out-of-game zones
Work, University, Shop, Courtyard - places that are not displayed in the game and are unavailable for in-game interaction. They are used as an element of quests or as an environment for performing individual in-game actions. Visiting out-of-game areas affects the character's characteristics. Zones are available during specific hours of in-game time.

Simulation element. In-game actions
Each in-game action affects the characteristics (resources) of the player. Most actions consume time, correspondingly increasing the time on the game clock).

Action	**T**	**E**	**M**	**W**	**Локация**
A little work	⇩	⇩		⇩	desktop
Study a little	⇩	⇩		⇩	desktop
Online call	⇩	⇩	⇳	⇩	desktop

Going to university	⇩	⇩	⇳	⇩	off-game area
Commute to work	⇩	⇩	⇳	⇩	off-game area
Homework	⇩	⇩	⇧	⇩	desktop
Eat	⇩	⇧	⇧		off-game area
Read the news	⇩	⇩	⇩		desktop
Lounge on the sofa	⇩	⇧			sofa
Lie on the carpet	⇩	⇧			carpet
Go to bed	⇩	⇧			off-game area
Play the keyboard	⇩		⇧		synth
Watch movies	⇩	⇧	⇧		sofa
untangle wires	⇩	⇩			room
Wash a window	⇩	⇩			window
Vacuum a rug	⇩	⇩			carpet
Clean the trash	⇩	⇩			room
Wipe dust	⇩	⇩			room

In-game interactive items

The player's inventory can contain three groups of items

1. Rubbish - objects that need to be removed from the playing area.
2. Interaction items (rag, bin) - combined with other items, do not leave the game space
3. power-ups - items applied to the character - energy drinks, coffee, etc.

Game achievements

Achieving game results separate from the quests in the course of the game, gives the player the opportunity to, for example

- sleep for 8 hours
- spend 6 game days without using separate power-ups

- to clear and customize all musical instruments
Achievements are counted and displayed when the game is summed up. Receiving certain Achievements can temporarily change a character's characteristics.

NPC
Presented as participants in a dialogue with a character online (colleagues, classmates) or in the game area (partner), give out in-game quests.

2.2 Rules

Main basic rules are listed below:

- To win the game, the player must complete all main storyline quests in a timely and consistent manner
- Game time runs both independently and according to the actions of the player.
- The performance of in-game actions and interaction with in-game items affects the character's characteristics
- Upon reaching zero energy, the character loses consciousness and recovers partially after a short period of gameplay time
- At the end of 6 game days, a game score is compiled to determine the success of quests completed, the total number of points and Achievements gained by the player
- The player cannot leave the game area
- Game events are tied to the game time
- The player can choose not to perform optional quests in the game
- Player can use power-ups and in-game time of day features to optimize the consumption of game resources
- Quests are initiated after active consent of the player

2.2.1 Interaction rules

Using the keyboard allows you to freely move the camera inside the game space without changing the angle (right-left-up-down)

Left mouse click to move the character to a specified point in the game space, avoiding in-game obstacles (couch, table)

Left click on an item within a character's reach shows information about the item.

Right-clicking on an item in the character area puts the item in the inventory, or applies an item in the inventory to an item in the character area (put the item in the waste bin or on the shelf).

Interaction with GUI: when pointing at a GUI element, clarifying information is displayed (number of E, M, W, T units).

When a door is clicked, if it is within the character's reach, it exits to a non-game area (before which an action selection menu is displayed).

2.2.2 Artificial Intelligence

The game does not include non-playable characters with as self-driving agents

2.3 Game world elements

The Flat
the area where objects, containers, interfaces are placed

Objects
rubbish, things and interfaces for interaction

Time
The central part of the game world moving in one direction

2.4 Game log elements

List of quests completed - compulsory and optional
Composition of Achievements received
Existence of power-ups that modify
Inventory list
Location of game items
Score points for completed quests
Game Time: determines at what point in the main storyline of the game the main character is
Save: determines the moment of the player on the playing field, a set of characteristics fixed for the player at that moment.

2.5 Other elements

2.6 Assets list

- Main Character
- Trash
- Stuff
- Interfaces
- Text commenting system with item descriptions
- Quest Assignment System with NPC dialogs
- Movement Model
- Camera
- Scoring Model and Game Stats

3 Dynamics

3.1 Game World

3.1.1 Game theme details

The game world is a space-limited flat area with a graphical background and sprites of items on it.
The game clock is the main element that defines gameplay, events that occur, quests, and the duration of the game. 1 game hour equals 2 real minutes. Various actions taken by the character also consume time according to the game's stats model.

The focus of the game is the main character, placed in an enclosed space, and his interaction with the environment, represented by rubbish, personal belongings and interfaces.

3.1.2 Missions/levels/chapters Flow

The system of game quests is based on their initiation at set periods of game time (phone call, scheduled activities), and on the interaction with individual items (collecting rubbish, placing items in positions).

Game time divides the scenario into 6 days, starting at 6:00 on each subsequent day:
1. difficult morning (Monday)
2. Kindness and reciprocity (Tuesday)
3. Evening challenge (Wednesday)
4. Dreaming of the future (Thursday)
5. Sticky work (Friday)
6. The final rush (Saturday)

3.2 Missions/levels/chapters elements

The scenario of each quest is determined by the prerequisites:

- the fact that previous quests have been completed
- weekday and the time of day and night
- availability of specific items in the inventory

After activating the quest the player gets a welcome inscription on the screen that the quest began and the objectives.

On successful completion of the quest, depending on the quest contents, the player receives points, paramater changes, power-ups, and the quest completion inscription. On unsuccessful completion of the quest the player receives a corresponding inscription. Some non-time-based quests can be reinitiated the next day.

3.2.1 Objectives

Typology of the quest elements:

- pick up all the rubbish and get rid of it
- rearrange the items to the right places
- use an item repeatedly in the given location
- complete a set of activities in the allotted time

3.2.2 Rewards

1. Successful completion of a quest gives the player points, achievements, power-ups and/or increases current character parameters
2. Successful completion of a particular sequence of actions gives the player a themed achievement
3. Completion of individual quests increases the size of a character's inventory

3.2.3 Challenges

The player's task is to complete as many cleaning tasks as possible by the end of the game time - these will determine the success of the final result.

In-game story quests serve the purpose of diverting the player's time and resources to complete them, as well as providing the replenishment of resources (characteristics) needed to successfully complete the cleaning tasks.

3.3 Special areas

The game provides special non-game areas that are part of the story quests. There is no interaction in these scenes.

3.4 Game interface

The game interface is represented by several main screens
Main menu (start a new game, continue from the last save, high scores, achievements, exit the game)
Pause menu (exit to main menu, save and exit the game)
Main game interface is represented by GUI, displaying current game time, player's parameters, inventory contents

3.5 Controls interface

LMB - move to a position, select a menu element
RMB - interact with an object / move to the object and interact
MMB - open the description or a comment on an object
WSAD - controlling the camera position
Esc - menu

3.6 Game Balance

Main character:
Energy (E)
Mood (M)
Work-to-do (W)
Speed

Game:
Time (T)

4 Visuals and Sounds

4.1 Game visuals

The game includes basic in-game visuals: the appearance of dialogue boxes, moving the character and items.

4.2 Game sounds

When a character interacts with items and interfaces, sounds symbolising the relevant item are emitted.

5 Document information

5.1 Definition, acronyms and abbreviations.

TBA in next revisions

Term or abbreviation	Definition and acronyms

5.2 Document references.

TBA in next revisions

6 Attachments

TBA in next revisions

7 Project plan

Start date	Deadline	Activity	Results

11.05.2022	25.05.2022	Game Concept, Paper prototype preparation and video recording	- Game Concept description - Video of a paper prototype - GitHub repository created - GDD created - Game Development plan published
26.05.2021	07.06.2021	Developing game Updating GDD Creating a playable prototype Arranging collision systems	- GDD updated - Physics Assets chosen, installed, tested, updated - Player controls tested - Main player model and basic texture - NavMesh implemented - Inventory system model tested and implemented - Player model tested - Quest made and tested
01.06.2021	14.06.2021	Arranging animations Updating GDD	- Moving animated character - Flying and special modes animations - GUI (stats, inventory, lives), HUD
08.06.2021	21.06.2021	Updating GDD Creating inventory system and objects	- Achievements implementation - Dialogue system - Inventory meny - Inventory objects (at least 3)
15.06.2021	28.07.2021	Game Polishing Game Evaluation Updating GDD Quest creation	- Success/Failure conditions testing - Testing quest
22.06.2021	05.07.2021	Game Polishing Game Evaluation Updating GDD Game menu Sound effects	- Game menu logic creation - Game menu modes tested - Sound effects assets added
29.06.2021	12.07.2021	Balance testing	- Achievements balanced - Difficulty tested and balanced
20.07.2021	19.07.2021	Game finalization and testing	Tested game with necessary scenes

8 Typical engine subsystems explanations:

Base game toolkit

Adventure Creator 1.74[1] is used as a suprasystem for optimizing game development: assets combining, time, parameters and quests are embedded in AC as subsystems.

[1] *Adventure creator: Game toolkits*. Unity Asset Store. (n.d.). Retrieved May 25, 2022, from https://assetstore.unity.com/packages/tools/game-toolkits/adventure-creator-11896

Game collision systems
Navigation with objects in the environment is implemented through the 2D Polygon Collider and Mesh Navigator. When using Point and Click navigation, the character moves to a given point, limited by the space of the map and bypasses objects

Event Handling and scripting
Interaction with each game item can be implemented through Examine or Use. In this case the game item can be accompanied by the player's annotation (text commentary).

Game Logic and Game Object Model
When an item that can be put in the inventory hits the cursor area and when you left click, a "Use" action is performed, which moves the character to the item. The item is teleported out of the playing field and its indicator appears in the inventory. When using an item from the inventory (left click) on another active item, the script is triggered (dialog box and removal of the item from the inventory)

Graphics
The graphical subsystem of the game involves referring to models loaded through the game's Assets. Camera position and settings determine the visual field.

User Input/Output
The data entered by the player from the keyboard and mouse are used to navigate the game and interact with the objects.