Testing of Diamond City game using GDD

Game installation file (.apk):
https://drive.google.com/file/d/1Ii0g1JdJCm_Ihqu9890wOZXkbR_zS3gr/view?usp=sharing
Game Design Document:
https://docs.google.com/document/d/1LfkrUmyW_fgEyG8Id_YPXYH3ADQNxRKvjF7KPQvaHy8/edit?usp=sharing

Tasks:
1. Review GDD for in-game functionality for completeness/unambiguity and compliance with the current implementation.
2. Using basic test design techniques, create a checklist for testing this functionality.
3. Develop several test cases to test complex in-game mechanics.
4. Compile and describe bug reports for defects discovered during game testing and working with GDD.
5. Describe the basic approach and steps in testing.

1.
Issues found in the documentation:
Parking:

1. The parameter "Price" in the parking modal window is not described.
2. The "Revenue" parameter is missing in the parking modal window (3. Revenue - the amount of notes per second from 1 occupied space).
3. The "Total Parking Revenue" parameter is missing in the parking modal window (4. Total parking revenue - the sum of revenue from all occupied spaces), but it is displayed when clicking on the "Notes" icon in the upper left corner of the screen under "City's Revenues," displayed in notes per minute.
4. The parameters "Price" and "Movement Interval," which exist in the game, are not described in the documentation.
5. It is recommended to provide a more detailed description of the interaction cycle between the Car and the parking lot.

An approximate variant of the interaction cycle could include steps like:

- queuing
- car entry
- parking space occupation
- passenger disembarkation
- waiting
- passenger boarding
- car exit from the parking lot

6. The "Number of Available Spaces" parameter, which indicates the number of free spaces in the parking lot, is not described. Additionally, if there is congestion on the

parking lot (separate mechanic), a warning icon should be displayed instead of the number of available spaces until the congestion is resolved.

City's Cash Registers:

1. The "Visitor Growth" parameter is ambiguously described (6. Visitor Growth - increase in the number of visitors depending on the cash register level). The level of the cash register does not increase the number of visitors but only speeds up visitor processing if there is a queue. Also, this parameter is not present in the "Entrance and Cash Registers" modal window.
2. Discrepancy between the specification and the game: "Upgrading the cash register: Upon clicking the upgrade button, the cash register increases its current level by +1, without deducting money from the player." However, in the game, money is deducted from the player upon upgrading the cash register.
3. Discrepancy between the specification and the game: "Based on the level of the cash register, the following parameters change: 1. Number of visitors; 2. Level cost." Increasing the cash register level does not increase the number of visitors; it only increases the speed of visitor processing.
4. Ambiguous description: "Upon clicking the purchase button:

   1. An amount equal to the cash register's cost is deducted from the player based on the cash register number.

   2. A new level 2 cash register appears." It should be clarified as "A cash register is added based on the specified cash register number upon purchase."

City Buildings:

1. The operation cycle of the city buildings is not described in sufficient detail.
2. Possible parameters of the city buildings are not defined.

Helicopter:

1. Incomplete description of the object's parameters: when interacting with the helicopter, a modal window opens with an offer to watch a rewarded video for a reward, and when pressing the "No, thanks" button, the helicopter flies away.

4. Check-list

5. Test-cases:

ID:	TC001	**Target Description:**	Checking the cycle of interaction between the machine and the parking			
Type:	Functional		**Priority:**		High	
Pre-conditions:						
	1	Diamond City game is opened on the phone				
Steps						
		Step	Expected result		Status	Bug report ID
	1	Check the cycle of interaction between car and parking	The car drives up and queues for parking or stops in front of the barrier		Pass	
			If there are free parking spaces, the barrier opens		Pass	
			After the barrier opens, the car enters the parking		Pass	
			The car occupies a free parking space after entering parking		Pass	
			Characters are generated near the car and go towards the cash register building (characters get out the car)		Pass	
			Characters approach the car and disappear (characters get into the car)		Pass	
			The car leaves the parking through the exit		Pass	
			At the exit, a barrier opens in front of the car		Pass	
			The car left the parking		Pass	
Executor:		Artem Demeshchenko		**Date:**		17.06.2024

ID:	TC002	**Target Description:**	Checking the possibility of receiving a reward for watching a rewarded video from a helicopter			
Type:	Functional		**Priority:**		Medium	
Pre-conditions:						
	1	Diamond City game is opened on the phone				
		Steps				
	Step		Expected result		Status	Bug report ID
1	If the helicopter is on the helipad, tap on the helipad		A pop-up opens with buttons: "Нет, спасибо", "Получить" (with a video icon) and an additional window with an offer to purchase the opportunity to receive instant profit for real money and also with the "Получить" button		Pass	
2	In the main window that opens, check the proposed amount of a possible reward for watching the reward video		The window shows the amount of N soft currencies and N hard currencies		Fail	QBR-3
3	Tap on the "Получить" button (with the video icon)		A 30-second advertising video begins to play and at the end of the viewing a button to close the video "X" appears		Pass	
4	Watch the video for 30 seconds and after watching, close the video with the close button "X"		The video closed		Pass	
5	Check the correctness of crediting profit and currency value after watching the reward video		The previously specified currency value N is credited to the account		Pass	
Executor:		Artem Demeshchenko		**Date:**		17.06.2024

6. Bug reports:

ID	QBR-1				
Reporter:	Artem Demeshchenko	**Assignee:**	<developer>	**Status:**	New
Type:	functional	**Severity:**	minor	**Priority:**	medium
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14

Summary:	Number of cash desks is 8 in the cash register building
Description:	Inappropriate number of cash registers in the cash register building ("Вход и кассы") - 8

Pre-conditions:	
1	Diamond City game is opened on the phone

Steps to reproduce:	
1	Move screen to cash register building
2	Verify amount of possible cash register

Actual result:	
1	The amount of possible cash registers is 8

Expected result:	
1	The amount of possible cash registers is 9

Attachments:

Additional info:

ID	QBR-2						
Reporter:	Artem Demeshchenko	**Assignee:**	<developer>	**Status:**	New		
Type:	functional	**Severity:**	minor	**Priority:**	medium		
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14		
Summary:	The helicopter returns to helipad 1 minute after leaving the helipad						
Description:	Wrong interval between helicopter's departure and arrival - The helicopter returns to helipad 1 minute after leaving the helipad						
Pre-conditions:							
	1	Diamond City game is opened on the phone					
Steps to reproduce:							
	1	Move screen to helipad					
	2	Verify that helicopter located on helipad (arrived)					
	3	Tap on helipad zone					
	4	In opened pop tap on button - "Нет, спасибо"					
	5	Verify the amount of time that the helicopter will be absent from the moment of takeoff until the moment of landing					
Actual result:							
	1	After tapping "Нет, спасибо" button, helicopter left the helipad					
	2	The helicopter returns in 1 minute					
Expected result:							
	1	After tapping "Нет, спасибо" button, helicopter left the helipad					
	2	The helicopter returns in 2 minutes					
Attachments:							
Additional info:							

ID	QBR-3				
Reporter:	Artem Demeshchenko	**Assignee:**	<developer>	**Status:**	New
Type:	functional	**Severity:**	minor	**Priority:**	High
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14
Summary:	When interacting with helicopter, displays a suggestion watching a Rewarded video with rewards only in the form of Soft currency				
Description:	_				
Pre-conditions:					
1	Diamond City game (City_0.1.3(3.02) hotfix) is opened on the phone				
Steps to reproduce:					
1	Move screen to helipad				
2	Verify that helicopter located on helipad (arrived)				
3	Tap on helipad zone				
4	In opened pop verify the reward indicated in the offer				
Actual result:					
1	The offer indicates a reward only in the form of Soft currency				
Expected result:					
1	The offer includes a reward in the form of Soft and Hard currency				
Attachments:					
Additional info:					

ID	QBR-4				
Reporter:	Artem Demeshchenko	**Assignee:**	<developer>	**Status:**	New
Type:	functional	**Severity:**	minor	**Priority:**	High
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14
Summary:	The train arrives at the station 30 seconds after leaving the station				
Description:	Wrong interval between train's departure and arrival - The train arrives at the station 30 seconds after leaving the station				
Pre-conditions:					
	1	Diamond City game is opened on the phone			
Steps to reproduce:					
	1	Move screen to train station			
	2	Verify that train located on station (arrived)			
	3	Wait until the train departs			
	4	Record the time from the moment the train departs until the moment it arrives			
Actual result:					
	1	Interval between train departs and arrives is 30 seconds			
Expected result:					
	1	Interval between train departs and arrives is 60 seconds			
Attachments:					
Additional info:					

ID	QBR-5				
Reporter:	Artem Demeshchenko	**Assignee:**	<developer>	**Status:**	New
Type:	functional	**Severity:**	minor	**Priority:**	medium
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14
Summary:	Wrong multiplier when purchasing multiplication for hard currency - x3 in the offer for multiply profits during absence from the game (offline time)				
Description:	Wrong multiplier when purchasing multiplication for hard currency - x3 in the offer for multiply profits during absence from the game (Mechanics of crediting profits during offline time)				

Pre-conditions:

1	Diamond City game is opened on the phone

Steps to reproduce:

1	Quit the game
2	Wait 5 minutes
3	Open the game
4	In appeared pop up, look at lower window
5	Verify the value of the profit multiplier when purchasing multiplication for hard currency

Actual result:

1	Multiplier value is x3 when purchasing multiplication for hard currency

Expected result:

1	Multiplier value is x5 when purchasing multiplication for hard currency

Attachments:	
Additional info:	

ID	QBR-6						
Reporter:	Artem Demeshchenko	**Assignee:**	<developer>	**Status:**	New		
Type:	functional	**Severity:**	minor	**Priority:**	High		
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14		
Summary:	Price in form of hard currency is 20 units in the offer for multiply profits during absence from the game (offline time)						
Description:	Price in form of hard currency is 20 units in the offer for multiply profits during absence from the game (Mechanics of crediting profits during offline time)						
Pre-conditions:							
	1	Diamond City game is opened on the phone					
Steps to reproduce:							
	1	Quit the game					
	2	Wait 5 minutes					
	3	Open the game					
	4	In appeared pop up, look at lower window					
	5	Verify the price form of currency in the offer for multiply profits for x3 multiplier					
	6	Verify the price value in form of hard currency in the offer for multiply profits for x3 multiplier					
Actual result:							
	1	The price value in the offer for multiplying profits for the x3 multiplier is 20 units of hard currency					
Expected result:							
	1	The price value in the offer for multiplying profits for the x3 multiplier is 30 units of hard currency					
Attachments:							
Additional info:							

ID	QBR-7						
Reporter:	Artem Demeshchenko	**Assignee:**	UI	**Status:**	New		
Type:	UI	**Severity:**	minor	**Priority:**	low		
Device:	OnePlus 9 5G	**OS:**	Android	**OS Version:**	14		
Summary:	Button "Пробка" is incorrectly positioned and partially extends off screen						
Description:	A button in the upper right corner of the screen with a proposal to clear the traffic jam ("Пробка") is incorrectly positioned and partially extends off screen						
Pre-conditions:							
1	Diamond City game is opened on the phone						
Steps to reproduce:							
1	On the main screen look in the upper right corner of the screen						
2	Verify positioning of button with a proposal to clear the traffic jam ("Пробка")						
Actual result:							
1	Button "Пробка" is partially extends off screen						
Expected result:							
1	Button "Пробка" is correctly positioned and not extends off screen						
Attachments:							
Additional info:							

7. In this project, I mostly used functional testing to verify the functionality compliance with requirements and user expectations. I conducted integration testing to check the interaction between different components and mechanics of the game. I reviewed the documentation (GDD) for completeness, clarity, and consistency with the current implementation. I created a checklist for testing the main components of the mechanics described in the documentation and developed several test cases to verify complex in-game mechanics. During actual testing, I first familiarized myself with the game and its structure. I performed superficial testing of key aspects such as game installation, entering and exiting the game, and checked the interface and basic functionality for significant defects. During the superficial testing, I found only 1 defect related to the UI component. Later, I tested the game based on documentation and delved deeper into each mechanic and component. In the testing process, 8 functional bugs were found along with 1 bug related to a UI element misplacement, for which I created bug reports and described them.