

the DARK KNIGHT



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Date: 11.01.25

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1 Game Concept

1.1 Summary of the Game

The Dark Knight

*In shadows where the darkness weeps,
A cursed knight stirs from his sleep.
His armor black as starless night,
His eyes ablaze with haunted light.*

*His noble heart, now torn and sworn,
By ancient curse at break of morn.
With blade upheld in armored hand,
He meets the friend who dares to stand.*

*Their weapons clash in torch-lit halls,
As echoes ring through castle walls.
Two warriors locked in deadly dance,
While shadows mock each shifting stance.*

*The battle rages, fierce and strong,
Between the right and ancient wrong.
Which force shall claim this fateful night—
The curse of dark or saving light?*

Summary

Step into a world both beautiful and treacherous, where you, a noble knight, seek to rescue your cursed friend. A curse put on himself, by obsessing over a book of dark magic. His use of dark magic eventually claimed him as his honor, nobility, and even sense of self drifted away.

Armed with courage and steel, you now brave the castle's dark halls, filled with deadly traps and hidden treasures. Engage in fierce combat, facing relentless waves of enemies and confronting your once-noble friend, now twisted by darkness.

To succeed, you will need not just bravery, but unyielding resolve. Few dare venture into such a place, but you are not alone. A loyal friend, skilled in the arcane arts, will accompany you. Although lacking physical strength, his magic will be invaluable, turning the tide of battle in your favor at crucial moments.

Gather gold and ancient runes, and seek out the enigmatic merchant who deals in powerful equipment, potent spells, and rare artifacts. Each trade could mean the difference between victory and defeat.

As the story reaches its climactic end, a question will find its answer: Who will triumph—a beacon of saving light or the shadow of encroaching darkness?

1.2 Central Game Mechanic

In The Dark Knight, the player assumes the role of a knight whose mission is to defeat a possessed friend, the dark knight, and free him from the dark magic that controls him. The player is accompanied by a magic-wielding ally, who is controlled by an AI.

Progress in the game involves moving from room to room within the castle. Each time the player enters a new room, they are locked inside and must defeat the dark knight's minions (AI controlled) and the dark knight (AI controlled). The dark knight will try to flee just before being defeated. To defeat him, the player needs to navigate through the maze-like structure of the castle. In the room furthest away from the first room, the player can defeat the dark knight. Both player and ally become stronger as they defeat enemies, while the dark knight scales in power by dealing damage to the player and ally.

Gold and runes act as currencies to buy better equipment, upgrades, spells, and other items from the merchant.

2 User Interface

This chapter shows the structure of the user interface and provides descriptions for every screen.

2.1 User Interface Structure

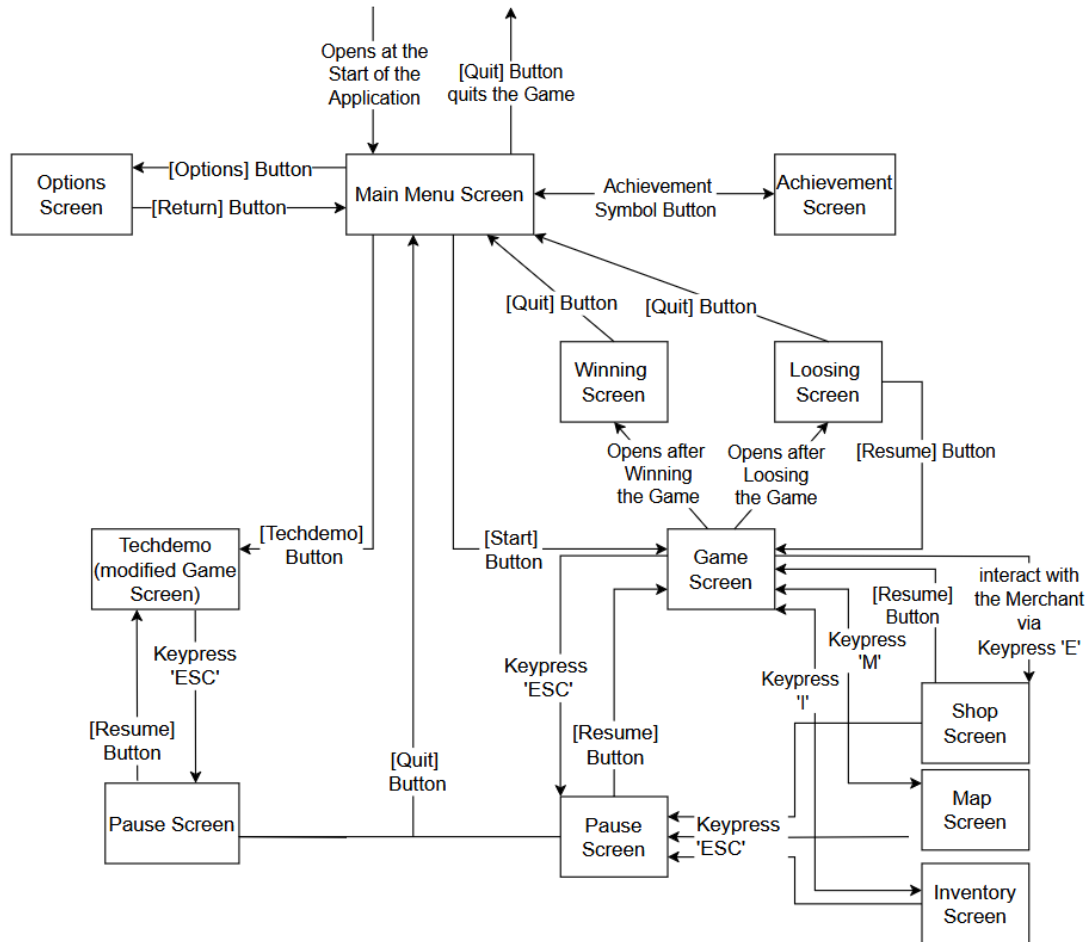


Figure 1: MenuStructure

The above Figure 1 shows an overview of all screens, as well as how they can be accessed.

2.2 User Interface Descriptions

This chapter explains every screen in greater detail.

Game Screen

Figure 2 shows the view of the player once the game is entered. The game is 2-dimensional and viewed from above. The camera moves automatically with the player character. The game features a HUD that contains the following elements:

- Player health bar
- Player inventory
- Gold display
- Health bars for non-player characters (NPCs)
- Health bar and mana bar for the ally



Figure 2: Screenshot of the game screen (post-processing: markers inserted)

The key assignment is as follows:

- Movement: up — left — down — right : [W] — [A] — [S] — [D]
- Interact with object: [E]
- Use Weapon: [Space]
- toggle fullscreen/windowed screen [F4]
- zoom in/out: [Mousewheel]

From the game screen, the following screens can be accessed:

- pause screen by pressing the [ESC] key
- winning screen by defeating the dark knight
- loosing screen by dying (Health of the player drops to 0)
- shop screen by interacting with the merchant (press the [E] key while the player character is near the merchant)
- map screen by pressing the [M] key
- inventory screen by pressing the [I] key

Main Menu Screen



Figure 3: Screenshot of the main menu screen

Figure 3 shows the main menu screen, which opens up at the start of the application. From the main menu screen, the following screens can be accessed:

- Game screen via the [Start] and [Resume] buttons
- Techdemo screen via the [Techdemo] button
- Achievement screen via clicking on the symbol in the top right corner
- Options screen via the [Options] Button
- You can close the Application with the [Quit] Button

Achievements Screen

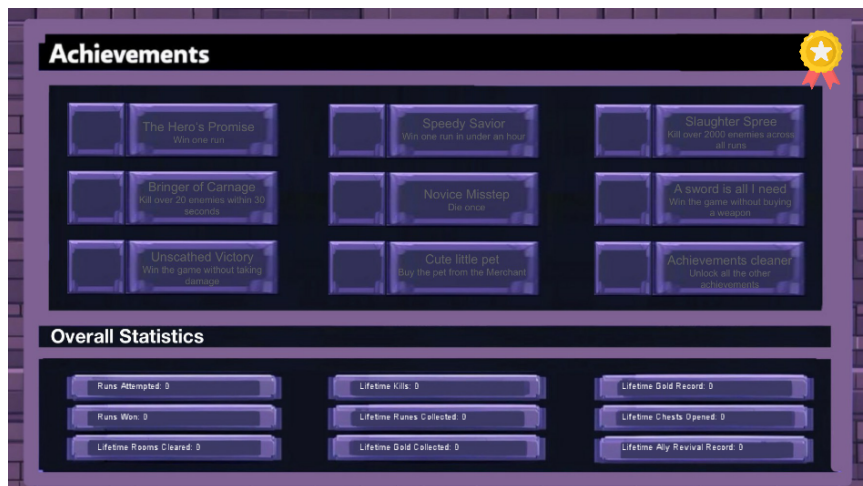


Figure 4: Screenshot of the Achievement Screen

Figure 4 shows the achievement screen, which displays the achievements and the overall statistics. From the achievement screen the main menu can be accessed by clicking on the symbol in the top right corner.

Pause Screen



Figure 5: Screenshot of the pause screen

The in Figure 5 shown pause screen can be opened from within the game screen or techdemo screen at any time by pressing the [ESC] key. Upon opening the pause screen, the current game state is paused and automatically saved to a file. The [Resume] button can be used to return to the game screen / techdemo screen (depending on from where it was opened). The [Quit] button can be used to return to the main menu screen.

Options Screen

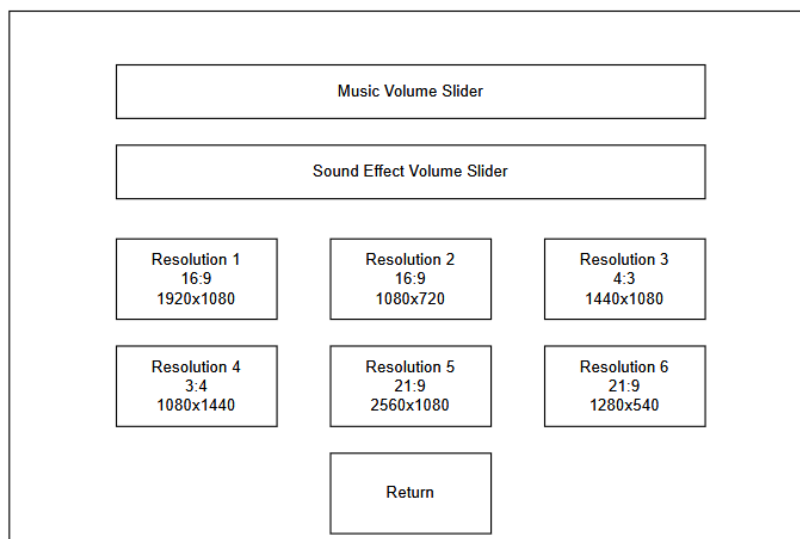


Figure 6: Diagram of the options screen

Figure 6 shows the the options screen. In the options screen the sound effect volume and music effect volume can be controlled via sliders and different resolutions can be selected via buttons. The [Return] button leads back to the main menu screen.

Shopping Screen



Figure 7: Screenshot of the shop screen (early stage of development)

Figure 7 shows the shop screen. This screen serves as the user interface for trading with the merchant. It allows the player to buy items, upgrade weapons and potions and refill health potions. The game is paused while the player is in the shop screen. From the shop screen, the following screens can be accessed:

- Game screen by pressing the [resume] button
- Pause screen by pressing the [ESC] key.

Inventory Screen

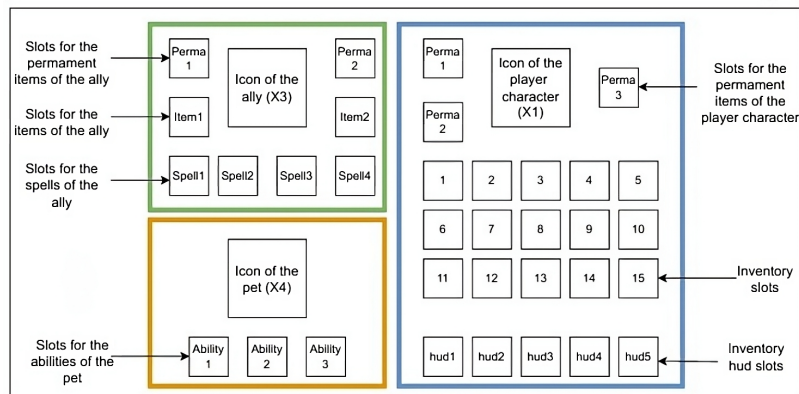


Figure 8: Diagram of the inventory screen

Figure 8 shows the inventory screen. In this screen the player is able to:

- view his items (blue frame)
- view the abilities of the pet (orange frame)
- view the spells, items, permanent items of the ally (green frame)
- view the items and permanent items of the player character
- transfer items from the inventory to the inventory hud slots
- transfer items from the inventory hud slots to the inventory

The inventory screen is rendered above the game screen. The game screen is still visible in the background and the game is not paused while the player is in the inventory screen. From the inventory screen, the following screens can be accessed:

- Game screen by pressing the [resume] button
- Pause screen by pressing the [ESC] key.

Map Screen

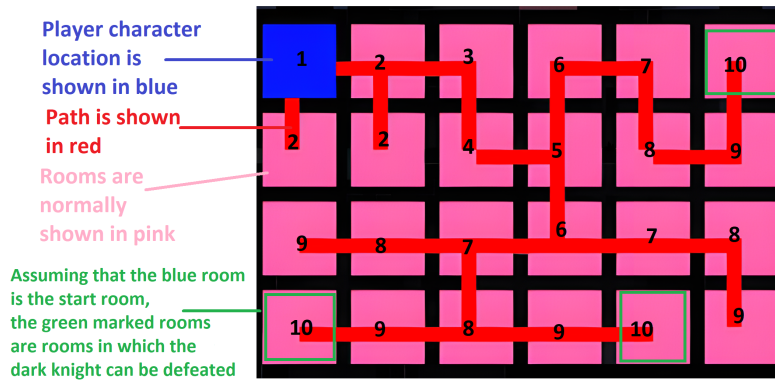


Figure 9: Map screen screenshot of debug view (early stage of development)

The Screenshot Figure 9 shows a debug view of the map screen. The map screen serves as a navigational help for the player to travel through the maze-like castle. Rooms not entered yet by the player will be blacked out, while rooms that have been entered before will be shown on the map (not done in the debug view). The map screen is rendered above the game screen. The game screen is still visible in the background and the game is not paused while the player is in the map screen. From the map screen, the following screens can be accessed:

- Game screen by pressing the [M] key.
- Pause screen by pressing the [ESC] key.

Loosing Screen

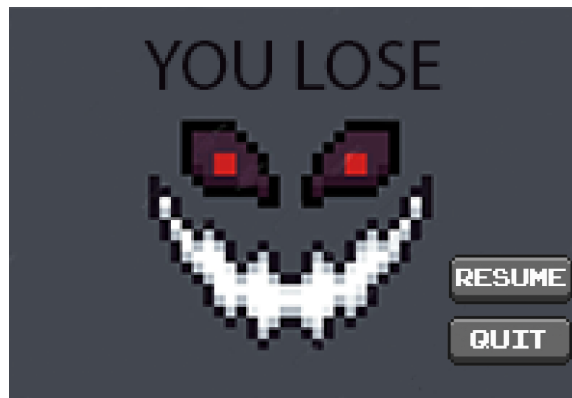


Figure 10: Loosing Screen

Figure 10 shows the loosing screen that automatically opens when the player character dies. From the loosing screen, the following screens can be accessed:

- Main menu screen via the [Quit] Button
- Game screen via the [Resume] Button (will load the last saved game state)

Winning Screen

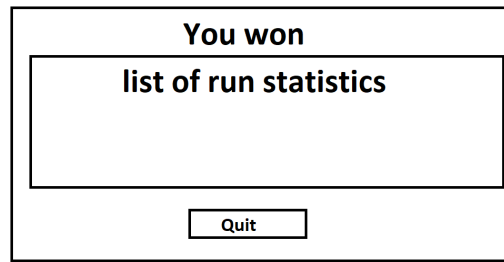


Figure 11: Diagram of the winning screen

Figure 11 shows a diagram of the winning screen, that automatically opens when the player has defeated the dark knight. The winning screen includes a list of the run statistics. From the winning screen, the main menu screen can be accessed via the [Quit] button.

3 Technical Specifications

The Game runs in real time, but can be paused at any point in time by opening the pause screen, which automatically saves the game state. The game keeps one save file, so saving will overwrite the previous save if it exists. If [resume] instead of [start] is used in the main menu screen and a save file exists, then this save file is loaded. If it does not exist, the [resume] behaves like the [start] button (creates a new run)

Sound effects and music are provided, though a sound device is not necessarily needed to run the game (so not part of the minimal requirements).

The game can be switched from full screen to a windowed screen by pressing the [F4] key.

3.1 List of used Technologies

The following technologies and software are used in the creation of this game and the game design document:

- Microsoft C# 12
- Microsoft .NET 8
- MonoGame 3.8
- Visual Studio Code
- Visual Studio
- JetBrains Rider and JetBrains Resharper
- Audacity
- LaTeX
- Sopra Services: Gitea, Jenkins, SonarQube, Mattermost, Discourse
- Gimp
- Tiled

3.2 Minimal system requirements

We assume the following system requirements are needed for our game to be playable without any issues:

- Operating System: Windows 10/11 or Linux
- Display Resolution (width x height): 1080x720
- CPU: Quadcore 2.8 GHz
- Memory: 8 GB
- GPU: Skylake GT2 HD Graphics 520
- Storage: 2 GB

3.3 Debug Console



Figure 12: Debug console with game screen in the background

The Game features a debug console (Figure 12) that can be accessed within the game screen and techdemo screen by pressing the [F1] key. The game state is paused while the debug console is open. The following keys are used within the debug console:

- "[F1]" to close the debug console
- "[delete]" to clear the debug console
- "[backspace]" to remove the last character in the debug console
- "[space]" to separate arguments from the command
- "[enter]" to activate a debug code
- All alphanumerical keys for entering debug codes

A list of all available debug codes with short descriptions is returned if the debug code `help` is entered and activated. All other debug codes will return a status message that tells if the debug code was executed successfully or is unknown and could not be executed. The debug console is not case sensitive.

3.4 Techdemo



Figure 13: Screenshot of the Techdemo Screen

Figure 13 shows the techdemo. It reuses the game screen (fig. 2), but consists of a different map, that has one large room (larger than the rooms used for the game). The techdemo can be accessed from the main menu screen (fig. 3) by pressing the [Techdemo] button. The techdemo consists of a large map, with collidable obstacles. The debug option **godmode** (player character is made invulnerable) will automatically be turned on inside the techdemo, but can be turned off by using the debug console. Useful debug options for the techdemo are especially **speedup** to increase the player character speed and **spawnenemy count** where **enemy** is replaced with the enemy type (for example **spawnskeleton count**) and **count** is replaced with a positive number to spawn count enemies of that type.

4 Game Logic

This chapter explains all interactions and objects of the game.

4.1 Options and Actions

This chapter explains all interactions of the game. It is divided into the following tables that explain different types of interactions:

- table 1 defines actions related to interacting with the screens described in chapter 3 User Interface.
- table 2 defines actions related to attacking
- table 3 defines actions related to the defeat of characters
- table 4 and table 5 define actions that involve items
- table 6 defines other actions

ID/Name	Actors	Event Flow	Initial Conditions	Completion Conditions
A1: Opening the Map	player	The player presses the [M] key.	The player is in the game screen (fig. 2).	The game screen is replaced by the map screen fig. 9.
A2: Closing Map	Player	The player presses the [M] key.	The player is in the map screen.	The map screen is replaced by the game screen.
A3: Pause the Game	Player	The player presses the [ESC] key	The player is in one of the following screens: game screen, map screen, shop screen (fig. 7) or inventory screen (fig. 8).	The game screen is replaced by the pause screen (fig. 5).
A4: Continue the Game	Player	The player presses the [resume] button	The player is in the pause screen.	The pause screen is replaced by the game screen.
A5: Open the inventory	player	The player is in the game screen and presses the [I] key. The inventory screen is rendered above the game screen.	The player is in the game screen.	The player is in the inventory screen.
A6: Close the inventory	player	The player is in the inventory screen and presses the [return] button. The inventory screen closes and the player returns to the game screen.	The player is in the inventory screen.	The player is in the game screen.
A7: Open the shop	player, merchant	The player is in the game screen and interacts with the merchant by pressing the [E] key. The game screen is replaced by the shop screen.	The player is in the game screen. The player character is close to the merchant.	The player is in the shop screen.
A8: close the shop	player, merchant	The player is in the shop screen and presses the [resume] button. The shop screen is replaced by the game screen.	The player is in the shop screen.	The player is in the game screen.

Table 1: Options and Actions Table: User Interface Actions

ID/Name	Actors	Event Flow	Initial Conditions	Completion Conditions
B1: Player attack	Player, enemy	Player presses the [Space] key. An attack animation is played. The attack decreases the health points of the enemies close and in front of the player character.	At least one enemy is in front of and close to the player character.	The attack animation of the player is finished and the health points of the enemy are decreased. If the health points of the enemy/dark knight are at zero or lower the appropriate defeat action(table 3) is executed.
B2: Pet Ability: Earth Spikes	Pet, enemies	The pet creates spikes to its left and right side	The ability is not in a cooldown phase and enemies are near the pet. If enemies are hit by the spikes their health points are decreased.	The spikes vanish after a few seconds. If the health points of the attacked character are at zero or lower the appropriate defeat action (table 3) is executed.
B3: Trap attack	trap, any character	character triggers a pressure plate that activates a trap. The characters health points are decreased by the trap.	The character steps unto a pressure plate.	The character steps away from the trap or the health points of the character decrease to zero or lower resulting in the appropriate defeat action (table 3)
B4: Enemy attack	Player, pet, ally, enemy	An enemy attacks the player character, ally, or pet. The health points of the attacked character decrease.	player character, ally, or pet is close to an enemy. Enemy attacks.	The attack animation of the enemy is finished and the health points of the attacked character are decreased. If the health points of the attacked character are at zero or lower the appropriate defeat action (table 3) is executed.
B5: Ally attack	Ally, enemy, dark knight	Ally attacks the enemy/dark knight using one of his attack spells (S1), (S3), (S4). The health points of the attacked character decrease.	ally has enough mana to use the spell.	The attack animation of the ally is finished and the health points of the attacked character are decreased. If the health points of the attacked character are at zero or lower the appropriate defeat action (table 3) is executed.
B6: Enemy attack spell	Player, ally, pet, dark knight, bringer of death	The dark knight uses one of his attack spells (S5), (S7), (S9) or the bringer of death uses on of his attack spells (S10), (S11)	This spell is not in a cooldown period.	The spell stops and enters a cooldown period.
B7: Dark knight portal spell	dark knight, enemies	This spell creates portals that spawn a enemies as described in (S6).	The spell usages are not exhausted.	The spell breaks after the set number of enemies have been spawned.
B8: Dark knight sphere spell	dark knight, enemies	The spell creates a black sphere that buffs enemies (randomly increases their health points, attack damage or speed) as described in (S8)	This spell is not in a cooldown period.	The spell breaks after 10 seconds and enters a cooldown period.

Table 2: Options and Actions Table: Attack Actions

ID/Name	Actors	Event Flow	Initial Conditions	Completion Conditions
C1: Defeat of an enemy	Player, trap, ally, pet, enemy	The health points of the enemy decrease to zero or below due to one of the initial conditions and his death animation plays	One of the following actions was performed: B1, B2, B3, B5.	After the death animation they enemy disappears. Items of table 14 are placed in the location where the enemy has died.
C2: Defeat of the ally or pet	pet, ally, enemy, trap, dark knight	the attacked characters health points decrease to a value smaller or equal to zero due to one of the initial conditions	One of the following actions was performed: B3, B4, B6 and and his death animation plays.	After the death animation of the character was played. The character will stay in it's position and does not react to it's environment till Action C6 is executed.
C3: Defeat of the player character	Player, enemy, trap, dark knight	player characters health points decrease to a zero or below due to one of the initial conditions and his death animation plays.	One of the following actions was performed: B3, B4, B6.	After the death animation was played for the player character, the player loses the game.
C4: Dark knight flees	Player, trap, ally, pet, enemy	Dark Knight health points decrease to 0 or below due to one of the initial conditions. Dark Knight flees from the fight.	One of the following actions was performed: B1, B2, B3, B5. The player is not in one of the rooms that are the furthest away from the start room.	The dark knight fled and will reappear with restored health points in the next room that the player character enters.
C5: Dark knight is defeated	Player, ally, trap, dark knight	Dark Knight health points decrease to 0 or below due to one of the initial conditions and his defeat animation plays.	One of the following actions was performed: B1, B2, B3, B5. The player is in one of the rooms that are the furthest away from the start room.	After the defeat animation of the dark knight was played, the player wins the game.
C6: Revive ally or pet	player, pet, ally	The player walks to the defeated pet or ally and presses the [E] key to use a potion of life (C6) to revive the character. The revival takes several seconds in which the player character is unable to move.	The character is defeated. The player has at least one potion of life in his inventory.	The health points of the character are increased to their maximal value.

Table 3: Options and Actions Table: Defeat Actions

ID/Name	Actors	Event Flow	Initial Conditions	Completion Conditions
D2: Move item to Inventory	Player	In the inventory screen the player moves the selector via the [Arrowkeys] to on an icon of an item in the HUD inventory slots and presses [Enter]. This causes the item icon to fill an empty inventory slot. The original HUD inventory slot becomes empty.	There is at least one item in the inventory HUD slots and at least one inventory slot is empty. The player is in the inventory screen. The item is not a weapon (See D6).	The moved item is in one of the inventory slots.
D3: Move item to HUD	Player	In the inventory screen the player moves the selector via the [Arrowkeys] to on an icon of an item in the inventory slots and presses [Enter]. This causes the item icon to fill an empty hud inventory slot. The original inventory slot becomes empty.	There is at least one item in the inventory slots and at least one HUD inventory slot is empty. The player is in the inventory screen. The item is not a weapon (See D6) or an item that is usable by the ally (See D7).	The moved item is in one of the HUD inventory slots.
D4: Player heals using a healing Potion	Player	The item health potion (C1 or C2) is in one the HUD inventory slots and is selected ([Arrowkeys] are used to shift the Selector to the left/right). The [Enter] key is pressed. The player is healed.	Health points of the player Character are below their maximum value. Health potion with at least one usage left is in one of the HUD inventory slots.	Health points of the player character increase to the maximum value. Health potion loses one usage.
D5: Player heals ally using a healing Potion	Player, ally	The item health potion (C1 or C2) is in one the HUD inventory slots and is selected ([Arrowkeys] are used to shift the Selector to the left/right). The keys [E] and [Enter] are pressed while the player character is near the ally. The ally is healed.	Health points of the ally are below their maximum value. Health potion with at least one usage left is in one of the HUD inventory slots. The player character is near the ally.	Health points of the ally increase to the maximum value. Health potion loses one usage.
D6: Change weapon	Player	In the inventory screen the player moves the selector via the [Arrowkeys] to on an icon of a weapon (table 7) in the inventory slots and presses [Enter]. The current weapon in the HUD inventory slot and the selected weapon in the inventory slot change places. The player now uses the new weapon.	the player is in the inventory screen and has at least one weapon in the inventory slots.	The selected weapon in the inventory slots and the current weapon in the HUD inventory slots have changed places.

Table 4: Options and Actions Table: Item Actions Part 1

ID/Name	Actors	Event Flow	Initial Conditions	Completion Conditions
D7: Give Item to to Ally	Player, ally	In the inventory screen the player moves the selector via the [Arrowkeys] to on an icon of an item in the inventory slots and presses the [Enter] key. This adds the item to the ally inventory. The original inventory slot becomes empty.	The player is in the inventory screen. The selected item can be used by the ally: Mana Bracelet (P5), Mystical Flower (L3), Tier 2 Mana Potion (C4), all spells (table 8).	The Item is deleted from the player Inventory. The ally can use the Item given to him.
D8: Open a stone covered doorway	Player	A bomb (C5) is in one of the hud inventory slots and is selected ([Arrowkeys] are used to shift the Selector to the left/right). The player interacts with the stone covered doorway via the [E] key, which places the bomb in front of the stones. After a few seconds the bomb explodes and destroys the stones. The player character, ally, pet can now walk through the doorway to a small room.	The player character is near a stone covered doorway. A pickaxe is one of the hud inventory slots and is selected.	The bomb explosion animation has played.
D9: Obtaining a Key	Player	Defeat all enemies in the room to make the Dark Knight flee. The Dark Knight drops one key (L4)	The room contains enemies with health points greater than zero.	All enemies in the room are defeated, causing the key to appear and become collectible by the player.
D10: Collecting an Item	Player	The player character is near an item. The player presses the [E] key. The item is transferred from the game world to the inventory of the player character.	An item is in the game world. The player character is near the item.	The item is in the inventory of the player character
D11: Buy Items, Upgrades, Refills	Player, merchant	The player uses his mouse to select and click one of the shop buttons, to either buy an item, buy an upgrade for an item or refill his health potion. The amount of gold and runes in the player inventory is decreased. Bought items are added to the player inventory. Upgrades and Refills are applied to the items in the player inventory.	The shop screen is open due to action A7.	The player performs action A8 to close the shop.

Table 5: Options and Actions Table: Item Actions Part 2

ID/Name	Actors	Event Flow	Initial Conditions	Completion Conditions
E1: Walking	Player	the player presses one of the following keys: [W] (up), [S] (down), [A] (left) and [D] (right) to move the player character.	The player character is in a walkable area, not blocked by any obstacles or enemies.	The player character moves freely until the input stops, or he is blocked by an enemy or obstacle.
E2: Pet Ability: Barrier	Pet	The pet creates a barrier around itself, that absorbs damage.	The ability is not in a cooldown phase. The pet has lost more than 3/4 of it's health points due to enemies or traps.	The barrier vanishes after a few seconds. The pet can then be damaged again.
E3: Ally healing spell	Ally, player, pet	The ally uses this spell. While it is active his health points are slowly restored to their maximal value. If the player or pet is near the ally his/it's health points will be slowly restored as well. While the spell is active the ally is immobilized.	The ally has enough mana to cast the spell. The health points of the ally, player or pet are below half of their maximum value.	The spell stops after a set amount of time. It stops immediately if the ally is defeated.
E4: Open a chest	Player	The player walks to a chest and presses the [E] key. The chest opens and items are placed near the chest.	The player is near a chest. The player has at least one bloody key in the inventory and the chest has not been opened before.	The chest is open and items are placed near the chest. One bloody key is removed from the player inventory.
E5: Destroy a box or barrel	Player	The player walks to a box or barrel and presses the [Space] key. The box or barrel is destroyed and items are placed near the box or barrel	The player is near the box or barrel.	The box or barrel is destroyed and items are placed near the box or barrel.
E6: Opening a Door	Player	The player character is near the locked door with at least one key (L4) in the inventory. The player presses the [E] key. The door unlocks and opens.	The player character has at least one key in his inventory and is near the door.	The door is unlocked. One key is removed from the player inventory

Table 6: Options and Actions Table: Other Interactions

4.2 Game Objects

This chapter lists all Game Objects and provides descriptions for them. If another game object is referenced within the description, its ID is named once per subchapter (to prevent unnecessary cluttering of the descriptions.)

4.2.1 Weapons

The player character (X1) is a knight and, as such, is able to use various melee weapons that he can find during his journey through the castle.

Upgrades: Every weapon can be upgraded three times at the merchant (X5). Each upgrade increases weapon damage slightly. Each upgrade of one weapon is slightly more expensive than the last upgrade of that weapon. Upgrade prices range from a very low amount of gold (L1) to a medium amount of gold.

Animation: Every attack swings the weapon in a half-circle around the player character, doing damage to all enemies that are close in front of the player character.

Interaction: Every weapon can be used to damage/kill enemies and break boxes and barrels. Every weapon can be upgraded at the merchant.

Name	Picture	ID	Attributes	Occurrence
Knight sword		W1	Damage: low Attack Speed: Medium Price: None, Start Weapon of the Player	The player character starts the game with this weapon.
Battle axe		W2	Damage: Medium Attack Speed: Slow Price: None, found in chests	Can be found in chests.
Wyvern slayer		W3	Damage: High Attack Speed: Slow Price: High	Can be bought from the Merchant for a high amount of gold.
Flail		W4	Damage: Medium Attack Speed: Medium Price: None, found in chests	Can be found in chests.
Dagger		W5	Damage: Low Attack Speed: High Price: None, found in chests	Can be found in chests.

Table 7: Definition of the Weapons of the Game

4.2.2 Spells

The ally (X3) of the player character (X1) is a mage. As such, he is able to use various spells to heal himself and damage/kill enemies.

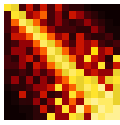
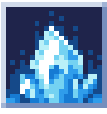
Name	Picture	ID	Attributes	Description	Occurrence
Holy Swords		S1	Damage: high Mana Cost: medium Price: high	This spell creates multiple golden swords in the air around the ally, which will fly downwards to the ground, damaging all enemies that are near the ally. Does not damage the Ally, Player and Pet (X4). Does destroy boxes/barrels.	Can be bought from the merchant (X5) for a high amount of gold (L1).
Healing		S2	Healing: low healing per second, but high healing capability due to a medium duration. Mana cost: medium Price: none, ally starts with this spell	This spell restores for a medium amount of time health points for the ally. The health points of the player character and pet are restored as well if they are near the ally. They ally is immobilized while casting the spell.	The ally starts the game with this spell. Cannot be bought or found.
Firebird		S3	Damage: High Mana Cost: High Price: high	This spell creates an animated bird made of fire that flies in the direction of casting and explodes upon contact with another object. Does a high amount of damage to enemies and destroys boxes/barrels. Does not damage the ally, player character and pet.	Can be bought from the merchant for a high amount of gold.
Ice Spikes		S4	Damage: medium Mana cost: low Price: none, ally starts with this spell	This spell shoots ice spikes of the ground near the ally. Does a low amount of damage to enemies near the ally. Does not destroy boxes/barrels and does not damage the ally, player character and pet.	The ally starts the game with this spell. Cannot be bought or found.

Table 8: Definition of the spells of the Ally.

The dark knight is a spell caster that uses the following spells. As the dark knight gets stronger, the cooldown period of the spells decreases, and the damage caused by the spells increases.

Name	Picture	ID	Description
Dark Beam		S5	This spell creates several beams near the player character and ally. The beams last for a few seconds and cause a low amount of damage if the player character, ally or pet enter one of the beams. The spell can be used an infinite number of times and has a low cooldown period.
Portal to Hell		S6	This spell creates multiple portals each spawning multiple enemies. The amount of portals and spawned enemies increase as the player progresses in the game. The portals disappear after spawning the enemies. This spell can be used multiple times per round, but not infinitely often.
Dark Hand		S7	This spell creates two portals to the left and right side of the player out of which magic hands appear to hit the player character. Each use of this spell spawns these two portals twice with a short delay in between. This spell causes a medium amount of damage. The spell can be used infinite times and has a high cooldown period.
Dark Sphere		S8	This spell creates a dark sphere. Enemies in range of this sphere receive a buff, that increases either their health points, attack damage or speed (randomly choosen). The spell has a rather high range. The spell lasts for 10 seconds. As soon as the spell stops, the buffs are removed. This spell can be used an infinite number of times at the later stages of the game and has a high cooldown period.
Exploding Eye		S9	This spell creates a magic eye near the player character that explodes after a short period of time. It causes massive damage, however because of the delay between appearance and explosion the player may be able to move the player character away from the eye and avoid the damage caused by the explosion. The spell can be used infinite times and has a medium cooldown period.

Table 9: Definition of the spells of the dark knight.

The bringer of death is a spell caster that uses the following spells:

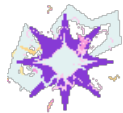
Name	Picture	ID	Description
Grip of Death		S10	This spell creates several portals near the player character and ally, out of which hands appear. If the player character, ally or pet come into contact with one of those hands the character (player character, ally or pet) receives a medium amount of damage. The spell lasts for a short time, can be used an infinite number of times and has a low cooldown period.
Crystal of Hell		S11	This spell creates a crystal near the player character. If the player character, ally, or pet are near the crystal the slowly loses health points. The spell lasts for a medium amount of time, has a low range and medium long cooldown period. The spell may be used an infinite number of times.

Table 10: Definition of the spells of the bringer of death.

4.2.3 Consumable items

Consumable items serve as extra help for the player character (X1) and ally (X3).

Name	Picture	ID	Attributes	Description	Occurrence
Tier 1 healing potion		C1	Usages: twice Upgrade price: High Refill price: Medium	Default health potion. The player can use this potion to heal the player character or the ally. Can be used twice and restores a medium amount of health points per usage. Can be upgraded to a Tier 2 healing potion at the merchant (X5) for a high amount of gold (L1). Can be refilled at the merchant for a low amount of gold.	The player will have this item from the beginning of the game.
Tier 2 healing potion		C2	Usages: four times Upgrade price: none, cannot be upgraded Refill price: low	Upgraded health potion. The player can use this potion to heal the player character or the ally. Can be used four times and restores a medium amount of health points per usage. Can be refilled at the merchant for a low amount of gold. Cannot be upgraded.	The player can upgrade C1 at the merchant for a high amount of gold to get this item.
Tier 1 mana potion		C3	Usages: once Upgrade price: high Refill price: none, needs mystical flower	Default mana potion. The ally automatically uses this potion to restore a medium amount of his mana points. Can be upgraded to a Tier 2 mana potion at the merchant for a high amount of gold. Can be refilled by the player if he has a mystical flower in his inventory. Can be used once.	The ally will have this item from the beginning of the game.
Tier 2 mana potion		C4	Usages: twice Upgrade price: none, cannot be upgraded Refill price: none, needs mystical flower	Upgraded mana potion. The ally automatically uses this potion to restore a medium amount of his mana points. Cannot be upgraded. Can be refilled by the player if he has a mystical flower in his inventory. Can be used twice.	The player can upgrade C3 at the merchant for a high amount of gold to get this item.
Bomb		C5	Usage: once Price: Medium	Can be used once by the player to destroy a doorway covered with stones (O7). When the bomb is placed at the doorway covered with stones, it explodes after a few seconds and a small room behind the doorway can be accessed.	The player can buy this item from the Merchant for a medium amount of gold.
Potion of life		C6	Usage: once Price: High	Can be used to revive the ally or pet.	The player can buy this item from the merchant for a high amount of gold.

Table 11: Definition of the Consumable Items of the Game

4.2.4 Permanent Items

Permanent items provide lasting benefits to the player character (X1) and remain in the inventory throughout the game. Since they give a rather significant advantage, they cannot be obtained at the beginning of the game. Obtaining most of these items is directly related to fighting the main opponent of the game - the dark knight.

Name	Picture	ID	Attributes	Description	Occurrence
Map		P1	Available: always	A detailed map of the castle that reveals explored areas. Non-explored rooms remain blacked out. The Player can open the map in order to look at the visited parts of the Castle and figure out where he/she needs to go. When the map is open it covers the whole screen.	The map is in the Player Characters inventory from the beginning of the game and can be opened anywhere at anytime.
Ice shard		P2	Effect radius: medium Purchase price: high Upgrade price: high	A magical shard orbiting the ally. When an enemy is within a medium radius from the ally his speed decreases drastically. The slowness effect can be increased by upgrading this item at the Merchant for a high amount of gold (L1).	The player can buy this item at the Merchant (X5) in exchange for specific runes.
Speed ring		P3	Movement boost: medium Upgrade price: medium	This silver ring increases the Player Characters movement speed. It can be upgraded once at the Merchant (X5) for a medium amount of gold (L1) to further increase the movement speed.	The player can buy this item at the Merchant in exchange for specific runes.

Table 12: Definition of the Permanent Items of the Game. This is Part 1 of 2

Name	Picture	ID	Attributes	Description	Occurrence
Health necklace		P4	Maximum health increase: medium Amount of possible upgrades: 2 Upgrade price: high	Increases maximum health of the Player Character. It can be upgraded twice at the Merchant (X5) for gold (L1). First upgrade will further increase maximum health. The second upgrade will allow the Player Character to passively restore a small points of health per second.	The player can buy this item at the Merchant in exchange for specific runes.
Mana bracelet		P5	Maximum mana increase: medium Amount of possible upgrades: 1 Upgrade price: medium	It increases the maximum Mana Points of the Ally (X3) if given to him by the player. It can be upgraded once at the Merchant (X5) for gold (L1) to further increase the maximum Mana Points of the Ally.	The player can buy this item at the Merchant in exchange for specific runes.

Table 13: Definition of the Permanent Items of the Game. This is Part 2 of 2

4.2.5 Loot

During the game, the Player will find various loot items that he can use to improve his equipment and buy various items.

Name	Picture	ID	Attributes	Description	Occurrence
Gold		L1	Currency type: common	Gold is the main currency in the game. After an enemy dies he is replaced with a certain amount of gold. The gold stays in it's position until the Player Character walks through it. Then it disappears and the gold, stored in the Inventory increases. The gold is used to buy the Merchants (X5) goods.	It appears in Chests, Boxes and Enemies.
Runes		L2	Currency type: rare	Runes are required in order to get items (P2, P3, P4, P5) which will grant the player permanent buffs. In order to get those items the Player needs to collect different runes and exchange them at the Merchant (X5). Different items require different combinations of runes.	Obtainable by defeating all the enemies in one room.
Mystical flower		L3	Currency type: rare	A Mystical flower can be used to refill one charge of the Mana Potions (C3, C4).	Obtainable by killing flying eyes and bringers of death.
Key		L4	Currency type: once per room	Allows the Player to open one door after killing all the enemies in the room, in which his/her Player Character is currently located.	Obtainable by killing all the enemies in the current room.
Bloody key		L5	Currency type: rare	Allows the Player to open one of the chests.	Drops rarely after killing an enemies.

Table 14: Definition of the Loot Objects of the Game

4.2.6 Environment

This table lists items that surround the player during playing, but do not affect the Player Character in any way.

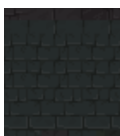
Name	Picture	ID	Attributes	Description	Occurrence
Walls		E1	Collidable: yes	Walls are the border of every room. They serve the purpose of creating a closed environment to fight. When a character in the game walks against a wall, he will remain in the same position, until he changes directions. When shot or hit against walls, the animation disappears and nothing happens.	The walls are the border for every room and corridor.
Holes in the ground		E2	Collidable: yes	When the Player Character collides with a hole, it walks against it until the direction is changed. When an object collides with a hole, the pathfinder searches the best way for them to walk around the obstacle. They do not cause any damage or effects when interacted with..	Holes are scattered across the map, serving as obstacles in various rooms and corridors.
Candles		E3	Collidable: no	Candles are used as decorations. There are no interactions with them. Characters can walk and shoot through them.	They can occur in any room, placed on the ground.
Spiderwebs		E4	Collidable: no	Candles are used as decorations. There are no interactions with them. Characters can walk and shoot through them.	They can occur in any room. Spiderwebs can hang on walls or lay on the ground.
Grid Holes		E5	Collidable: no	Grid Holes are used as decorations. There are no interactions with them. Characters can walk and shoot through them.	They can occur in any room, placed on the ground.
Path		E5	Collidable: no	In every room, there is a path that connects the entrance door to all other doors within the room.	The Path occurs in any room on the ground.

Table 15: Definition of environmental objects of the game

4.2.7 Main Characters

Player Character

This is the player, which is controlled by the person who is playing the game in real life. The Player Character is controlled by pressing certain keys on the keyboard. He can walk around in the rooms and corridors, collide with the environmental objects, fight the enemies with his weapons, collect loot and items, and upgrade him and his ally (X3) at the merchant (X5), by trading loot which was obtained before. The player can have various items, all of them can be seen inside his inventory.

Name	Picture	ID	Description	Occurrence	Health Points
Player Character		X1	This playable character offers a variety of interactions with the game world, centered on core mechanics such as fighting, running, and engaging with the environment. The Player Character can interact with enemies (F1-F7) by either damaging them using weapons (W1-W5) or receiving damage from them. Additionally, physical collisions occur when the player and an enemy walk into one another. Interactions with the environment are triggered by pressing specific keys on the keyboard (refer to the Options and Actions table). The Player Character can also interact with a merchant (X5) to upgrade existing equipment or acquire new items. The Player Character can view their current position on the map (P1) and interact with allies (X3 and X4). Interaction with allies includes resurrecting them using item (C6). Furthermore, the player can restore health to themselves and their allies using health items (C1, C2).	The Player Character is the main character and remains present throughout the entire duration of a round. The game's camera consistently follows the player, ensuring they are always visible.	high

Table 16: Definition of the Player Character

The Dark Knight

The Dark Knight is the primary antagonist and counterpart to the Player Character. Acting as a master summoner, he strategically uses dark magic and various spells to summon and enhance enemies, making each encounter increasingly challenging.

Name	Picture	ID	Description	Occurrence	Health Points
Dark Knight		X2	The dark knight serves as the player's counterpart, opposing them by summoning enemies and wielding dark magic to obstruct their progress. The dark knight is an enchanter-type fighter who keeps his distance from the player while summoning waves of enemies to inflict damage. After the player defeats all enemies in a room, the dark knight retreats to the next room, summoning even stronger waves. To challenge the player, he uses a variety of spells (S5-S9), either to enhance his minions or directly attack the player. The timing and use of these abilities are strategically determined based on: The number of enemies currently alive, the health of the player and their allies, whether casting multiple abilities together or separately would be more effective in the given situation. The dark knight scales linearly in strength but can further amplify his power by dealing damage to the player through his summoned minions. He is present in every room where the player is actively fighting and persists throughout the game, except during trading phases in the corridor with the merchant.	The dark knight is present in every room where the player is actively fighting and persists throughout the game, except during trading phases in the corridor with the merchant.	high

Table 17: Definition of the Dark Knight.

Ally

The ally is an AI-controlled entity that accompanies the player character in his journey through the castle. The ally is not gifted with physical abilities and therefore uses magic instead to help the player character.

Name	Picture	ID	Description	Occurrence	Health Points
Ally		X3	The ally is not physically gifted, so its AI is designed to stay close to the Player character while maintaining distance from enemies. The ally uses magical spells (S1, S2, S3, S4) that consume mana, which can be replenished using mana Potions (C3, C4). These potions can be refilled by using mystical flowers (L3). The Ally has health points (HP) that decrease when attacked by enemies. If his HP reaches zero, he will remain stationary until revived by the Player. The ally's spellcasting prioritization is influenced by several factors. If the Player Character's health is high, the Ally focuses on offensive spells. Conversely, if the Player's health is low, it prioritizes defensive spells. Additionally, the strength and number of enemies affect the ally's strategy. Against stronger enemies, it casts as many spells as possible to provide support. However, in less critical situations, it conserves mana for more significant challenges.	The ally follows the Player Character until his health points drop to 0. At that point, he stays in position until revived by the Player (using C6).	high

Table 18: Definition of the Ally

Pet

The AI-controlled pet is one of the items which can be obtained at the merchant. It is just as strong as the ally and has many helpful abilities that the AI can cast. It always follows the player and helps him defeat all the enemies.

Name	Picture	ID	Description	Occurrence	Health Points
Pet		X4	The pet is an AI-controlled companion that the player can acquire from the merchant. Once obtained, the pet functions as a secondary ally, offering valuable support during gameplay. The pet has three unique abilities: Earth Spikes: The pet spawns earth spikes to its left and right, dealing significant damage to enemies. This ability has a high cooldown. While Earth Spikes is on cooldown, the pet performs smaller attacks that deal low damage to enemies. Barrier Creation: When the pet loses most of its health, it creates a barrier that absorbs a large amount of damage. Due to its strength, this ability has a long cooldown. Health Regeneration (Passive): The pet slowly regenerates its health over time. The pet cannot be attacked by the player or allies, nor can it attack them. If the pet is taken down, it will remain stationary until revived using an item called "Potion of Life (C6)."	It can be purchased from the merchant (X5) for a large amount of gold (L1).	high

Table 19: Definition of the Pet

Merchant

The merchant meets the player character in every corridor between two rooms after the player character clears the room and opens the door to the corridor with a key (L4).

Name	Picture	ID	Description	Occurrence
Merchant		X5	The merchant is located and moves around the corridors in between the different rooms. His purpose is to trade with the player. Once the player character enters the corridor he can walk towards the merchant and interact with him via keypress [E]. The merchant offers upgrades, potion refills and items in exchange for gold (L1) or runes (L2). He can't be attacked but is collidable.	After the player has killed all the enemies in the current room, he'll obtain a key (L4) with which he can unlock a door to a corridor. The merchant appears in the corridor that the player has unlocked.

Table 20: Definition of the Merchant.

4.2.8 Controllable objects

Name	Picture	ID	Description	Occurrence
Door		O1	Every room will contain doors, that will require a Key (L4). After the player has killed all the enemies, he/she receives that key and is therefore able to unlock one door. Sometimes a room has more than one door. The decision which door to open has an impact on the following game since it opens another path. Once a door is unlocked it stays unlocked for the entire rest of the game.	Doors appear in every room, but the amount of doors per room can differ.
Box/ Barrels		O2	Boxes/Barrels are destroyable, collidable objects. They can be destroyed with the player characters' weapons, by hitting them. Once a box is destroyed it drops a few items on the ground for the player to collect them. While destroying a box/barrel the player character can't move, but can be attacked by enemies. Therefore the player has to choose wisely whether or not he/she wants to destroy the box.	These boxes/barrels occur in every room. They are there, the moment the player character enters a room for the first time. They will disappear after the Player has defeat the enemies in this room and the content of the boxes/barrels will be lost.
Fire trap		O3	A fire trap can be triggered if the Player Character or other living creatures (ally, enemies) step on the pressure plate (O5). All living creatures will take damage if they are within the range of the active fire trap.	Can be found in most of the rooms.
Spikes		O4	The spikes, like the fire trap, activates with a pressure plate (O5). If a Character (Player Character, Ally or enemy) steps on the pressure plate, the Character standing on the place where the spikes appears will take damage from them.	Can be found in most of the rooms.
Pressure plate		O5	Once a character of the game steps on the pressure plate, they trigger the spike or the fire traps, depending on which of the plates is triggered.	Can be found in most of the rooms right next to a trap.

Table 21: Definition of Controllable Objects. Part 1 of 2

Name	Picture	ID	Description	Occurrence
Chest		O6	Chests are static objects that cannot be walked through or damaged. To open a chest, the player must obtain a key (L5), which can be dropped by enemies, and use it to open the chest. The opening procedure takes a few seconds, during which the Player Character is unable to move and remains vulnerable to enemy attacks. Chests persist throughout the entire game and can be opened by the player at any time. There is a chance that the chest will turn into a mimic upon being opened. Defeated mimics drop the same rewards as the chest.	Chests appear in some rooms but also behind breakable walls (O7).
Stone covered doorway		O7	Stone covered doorways can be opened up with a bomb (C5). Walking through the opened doorway places the player character in a small room with one or two chests.	Stone covered doorways appear in some rooms. Because the reward is pretty high, they appear rarely.

Table 22: Definition of Controllable Objects. Part 2 of 2

Enemies

During the game, the player will face various waves of enemies that become increasingly difficult to survive as the game progresses. Each wave contains different types of enemies that spawn randomly and vary in difficulty to defeat.

Name	Picture	ID	Description	Occurrence	Health Points
Skeletons		F1	These enemies represent the basic level of foes and are easy to defeat. They have low health, their attacks are weak and they move with medium walking speed, making it possible for the player to run away from them. They attack by hitting their victim with a sword.	Skeletons appear especially at the first few rooms of the game.	low
Goblins		F2	Goblins have low health and their attacks are weak, however they spawn in large numbers. They have a high walking speed, so escaping them is difficult. They attack by stabbing their victim with a dagger.	Goblins appear in the earlier stages of the game.	low
Mushroom Enemies		F3	Mushroom enemies have a high health and high attack damage, but their movement is slow, making it easy for the player character to run away from them. They attack by beating the victim with their hands.	Mushroom enemies appear in the later stages of the game	high
Bringer of Death		F4	Bringers of death have low health, medium attack damage and move slow. They use range attacks in form of spells (S10, S11). If defeated they drop mystical flowers(L3).	Bringers of death appear in the later stages of the game.	low
Flying Eyes		F5	Flying eyes have medium health, medium attack damage and high flying speed, making it difficult to escape them. They attack by biting their victim. If defeated they drop mystical flowers (L3).	The start appearing in the middle stages of the game	medium

Table 23: Definition of the Enemies. Part 1 of 2

Name	Picture	ID	Description	Occurrence	Health Points
Mimics		F6	Mimics are enemies that disguise themselves as chests (O6) to trap unsuspecting players. As the player character opens a chest one of two options may occur: - the mimic chest behaves like a normal chest. It opens and the player can collect items that are placed next to it. - the mimic chest turns into the mimic enemy The mimic enemy has low health and medium attack damage. It moves slowly. It is not meant as a huge challenge, but more to catch the player off guard and give a scare.	Any chest has a chance to turn into a mimic	low

Table 24: Definition of the Enemies. Part 2 of 2

4.3 Game Structure

The following is a description of how the game could look played from the beginning to the end.

Example of one run of the Game

When the game begins, the player can choose to start a new game or load a previously saved one. Upon selecting a new game, by pressing 'Start', the player spawns in the first room alongside their ally.

The starting room is surrounded by walls, with a single locked door that can only be opened with a key yet to be found. Within the room, the player may encounter various interactable objects, such as a chest, wooden boxes, or even traps. At the start of the game, the Player Character is equipped with a Knight Sword (W19), while the ally carries two potions: an offensive Ice Spikes Potion (S4) and a defensive Healing Potion (S2).

As the game commences, the Dark Knight, a former friend turned antagonist, appears and summons a wave of enemies. The player's objective is to defeat all summoned enemies while avoiding attacks from both the enemies and the Dark Knight's spells. Hidden traps in the environment may also pose a threat. Each defeated enemy drops gold, which the player can collect.

Once all enemies in the room are defeated, the Dark Knight retreats to another room. A key and a rune (L2) appear as rewards for the player's success. The player picks up these items, uses the key to unlock the door, and proceeds into a corridor.

In the corridor, the player meets a merchant. The merchant offers various items, such as new weapons, spells for the ally, or upgrades that grant permanent advantages. The player can trade the collected gold and runes to improve their arsenal before entering the next room.

Upon stepping into the next room, the door behind the player locks, and the Dark Knight reappears, now stronger than before. The Dark Knight's power scales with the damage the player has taken in previous encounters, increasing the difficulty of each subsequent room.

The second room presents new challenges: no chest but additional wooden boxes and two locked doors. The player defeats the enemies in this room and must then choose which of the two doors to unlock. Choosing the correct path is crucial for cornering the Dark Knight later in the game, as some doors lead to dead ends.

After making their choice, the player uses another key to unlock the chosen door, entering a new corridor with the merchant waiting once more. Here, the player can purchase additional items or save resources for more powerful upgrades. After clearing more rooms and collecting enough runes, the player can afford to buy a pet to aid in combat.

The Player Character, ally, and pet work together to overcome increasingly challenging rooms. Each room brings them closer to the final confrontation with the Dark Knight.

Eventually, the trio reaches the last room, where the Dark Knight is cornered. With no room to flee, the Dark Knight fights with all his might, using his full arsenal of spells and summoning his strongest minions. After an intense battle, the player delivers the final blow, freeing the Dark Knight from the dark magic that had corrupted him.

The game concludes with a winning screen displaying run statistics. The player can review their achievements, start a new run, or exit the game.

4.4 Statistics

Listed in Table 25 are all the statistics, that are collected for each run separately (run statistics). Meanwhile, in Table 26 are all the statistics collected about all runs played (overall statistics), which are saved persistently on disk, so are saved between sessions of playing. Run statistics are shown in the pause screen, while the overall statistics are shown together with the achievements in the achievements screen.

Name	Description
Time Spent	Time spent in the current run
Rooms cleared	Number of rooms cleared by defeating all enemies within them during the current run
Enemies killed	Number of enemies killed in the current run
Damage dealt	Total damage dealt in the current run
Mana spent	Total mana spent by the Ally (X3) in the current run
Damage taken	Total amount of damage taken in the current run

Table 25: Table of collected run statistics

Name	Description
Runs attempted	Number of runs attempted
Runs won	Number of runs won
Lifetime rooms cleared	Number of rooms cleared across all runs
Lifetime kills	Number of enemies killed across all runs
Lifetime runes	Number of runes (L2) collected across all runs
Lifetime gold	Amount of gold (L1) collected across all runs
Lifetime gold record	Largest amount of gold collected in a single runs
Lifetime chests opened record	Largest Number of chests opened (O6) in a single run
Lifetime Ally Revival record	Largest amount of times the ally (X3) was revived in a single run

Table 26: Table of collected game statistics

4.5 Achievements

Listed in Table 27 are all achievements in our game. They can be looked up in the achievements and statistics menu. The achievements and the progress towards them are persistently saved to disk, so they can be gained across multiple sessions of playing the game.

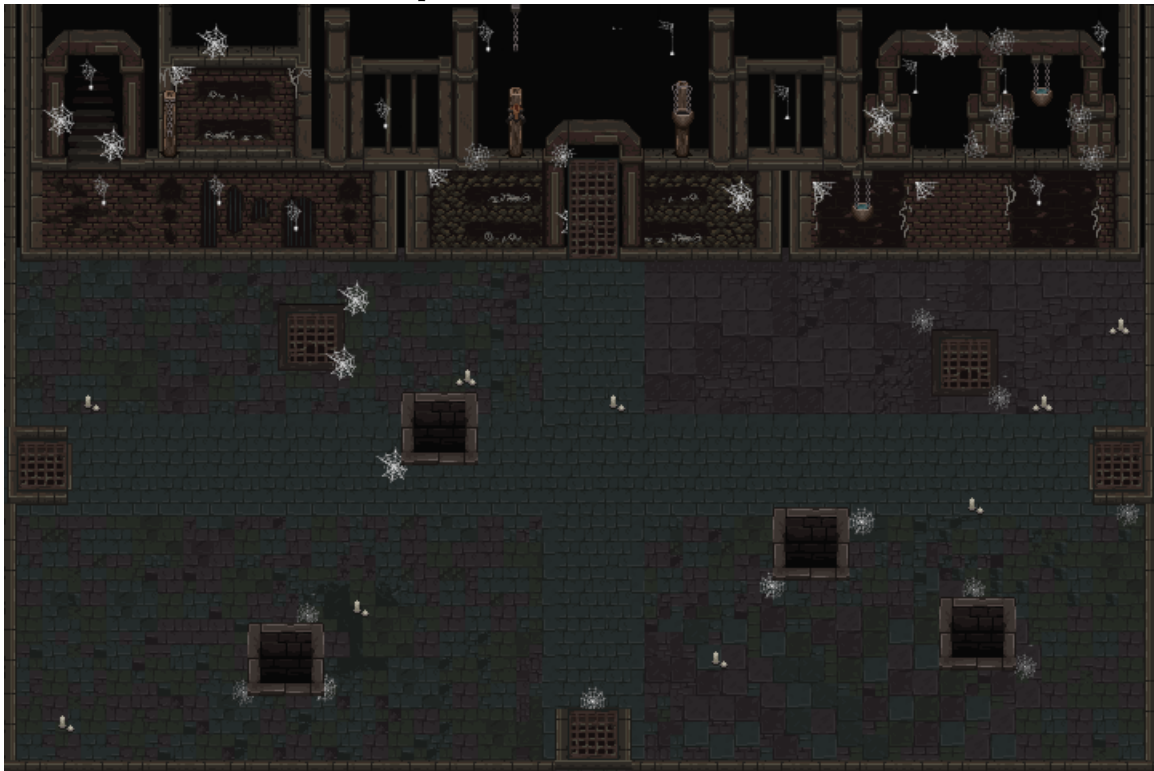
Name	Description
The Hero's Promise	Win one run
Seasoned Savior	Win 5 runs
Legendary Rescuer	Win 10 runs
Speedy Savior	Win one run in under an hour
Swift Deliverance	Win one run in under 30 minutes
Lightning Rescue	Win one run in under 15 minutes
Slaughter Spree	Kill over 2000 enemies across all runs
Massacre	Kill over 4000 enemies across all runs
Total Annihilation	Kill over 10000 enemies across all runs
Bringer of Carnage	Kill over 20 enemies within 30 seconds
Reaper's best friend	Kill over 50 enemies within 60 seconds
Novice Misstep	Die once
Resilient Adventurer	Die 10 times
Unscathed Victory	Win the game without taking damage
Cute little pet	Buy the pet (X4) from the Merchant (X5)
A sword is all I need	Win the game without buying a weapon

Table 27: Table of collected Achievements

5 Screenplay

5.1 Concept Art

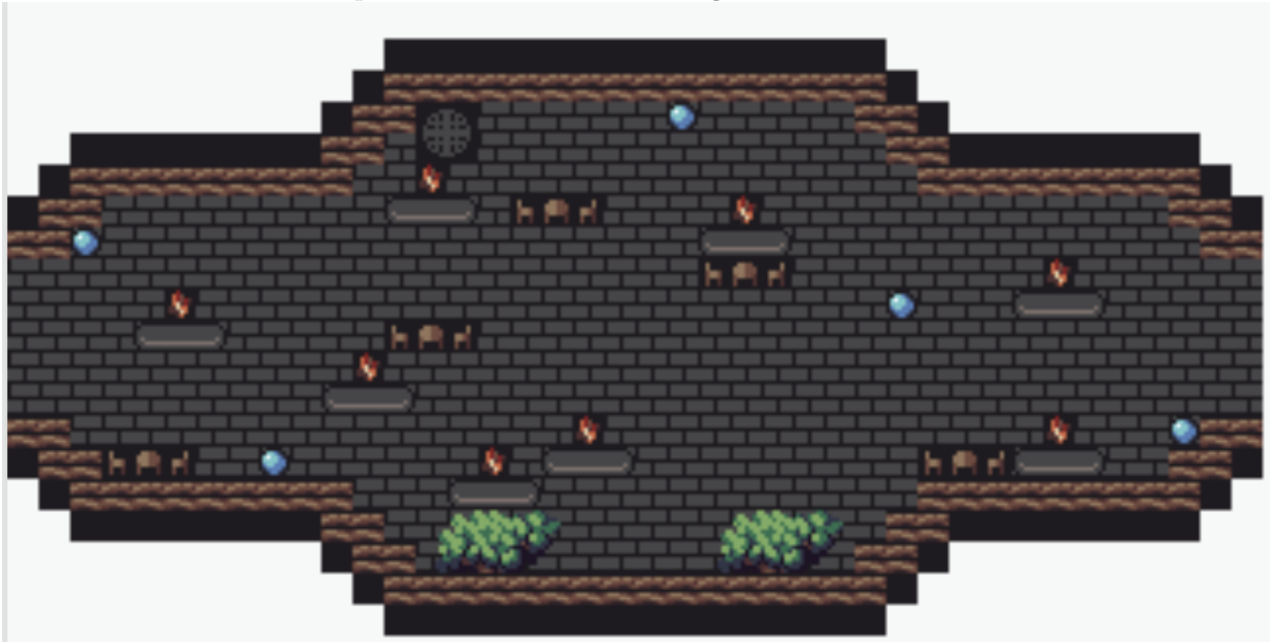
Concept of what the rooms look like



Concept of what a running game might look like



Concept of what the corridor might look like:



6 List of Changes

6.1 Central Game Mechanic Chapter

- Chapter shortened
- Clarified that the ally is controlled by an AI
- Player does not need to enter every room to defeat the dark knight. The rooms furthest away (in terms of path length) are rooms in which the dark knight can be defeated.

6.2 User Interface Chapter

Revised the structure of the chapter. Reworked diagrams and images. More detailed descriptions are now provided.

6.3 Technical Specifications

- Added that the game runs in real time, can be paused and saved at any time, and that the game provides sound effects and music.

6.3.1 List of Used Technologies Chapter

Extended the list of used technologies.

6.3.2 Minimum System Requirements

Lowered the minimal system requirements.

6.3.3 Techdemo

Added chapter **Techdemo**.

6.3.4 Debug Console

Added chapter **Debug Console**.

6.4 Options Tables

Restructured and extended with previously missing options.

6.5 Game Objects

Weapons:

- Knight sword deals low damage instead of medium.
- Buy price and upgrade price are now categorized as low, medium, or high.
- Specified that all weapons swing in a half circle around the player, damaging all enemies close in front of the player.

Spells:

- Cost per usage (Mana cost), amount of damage or healing, and prices are now categorized as low, medium, or high.
- Spells changed to spells for which we found good sprites:
 - *Fireball* → *Firebird*
 - *Holy Water Fountain* → *Healing Spell*
 - *Tornado* and *Windslash* removed and replaced with new spells: *Holy Swords* and *Ice Spikes*.
- Spell icons replaced.
- Added a new table with spells for the dark knight

Consumable Items:

- Amount of health points or mana points healed and prices are now categorized as low, medium, or high.
- *Essence of Life* renamed to *Potion of Life*.
- Killing enemies does not refill the mana potion. This makes the *Mystical Flower* more important as it is now the only option to refill the mana potion.
- Potion icons replaced.
- *Pickaxe* replaced with *Bomb*.

Permanent Items:

- Added attributes to the table for a better overview.
- Ice shard changed to an item that can be used by the ally instead of the player character. The ally now has two permanent items, the player has the remaining three permanent items

Loot:

- Differentiated loot into common and rare currency types.
- Clarified the occurrence of runes
- Updated occurrence description of the mystical Flower to name the enemies from which it can be obtained.

Environment:

- Removed Spiders and replaced them with other environmental features such as holes in the ground, candles, and pathways within the rooms.

Main Characters:

- The Ally is now explicitly described as AI-controlled.
- The Dark Knight is redefined as a secondary player-character counterpart.
- Added the table for the Player Character.
- The Pet has expanded capabilities, including Earth Spikes spell, barrier creation, health regeneration, and the ability to be attacked by enemies.

Controllable Objects:

- The chests may appear on the map under normal conditions, and are no longer restricted to locations behind breakable walls.
- removed cursed chest. The Game only offers one type of chest now. This chest may behave like a chest or by random chance may turn into a mimic upon being opened.
- replaced *breakable wall* with *stone covered doorway*. Stone covered doorways can be opened by the item *bomb* that serves as replacement for *pickaxe*.

Enemies:

- Replaced *wolfs* with *goblins*. Goblins have low health, low attack damage, high speed and spawn in large numbers. They attack by stabbing their victim.
- Replaced *orcs* with *mushroom enemies*. Similar behavior to orcs: High health, high attack damage, slow speed. They attack by hitting their victim with their hands.
- Replaced *ghost* with *flying eyes*. Flying eyes have medium health, medium attack damage, high speed. They attack by biting their victim.
- Replaced *healers* with *bringers of death*. Bringers of death have low health, high attack damage and slow speed. They have two attack spells

Game Structure:

- Transitioned the "Example of a Round of the Game" to a more general and factual tone, moving away from a campfire story format.

Achievements:

- The achievements and the progress towards them are now persistently saved to disk, so they can be gained across multiple sessions of playing the game.

6.6 Screenplay

Concept Art:

- Replaced outdated images with new concept art aligned with the current game version.