

Version: 4.1

Date: 29/5-15

Author: Kevin Hoogendijk, Alexander Håkansson, Alexander Karlsson, Maxim Goretskyy

This version overrides all previous versions.

REQUIREMENTS AND ANALYSIS DOCUMENT

The Legend of Chalmers



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1 Introduction

1.1 Purpose of application

The application is for pure entertainment and is targeted at students at Chalmers University of Technology.

1.2 General characteristics of application

The Legend of Chalmers is a game where you walk around Chalmers campus and discover different minigames where you earn *hec*. The game is a standalone desktop application for Windows, Linux and Mac. It is a top-down styled two-dimensional game where the player walks around in a world and encounters mini-games as he explores the world. The mini-games is an interpretation of the different problems students stumble upon during their time at Chalmers. The game is a single-player game but will be created in a way that enables for a future multi-player implementation. The game is real-time and grid based. The goal of the game is for the player to earn enough credits to get their exam (300 *hec*).

1.3 Scope of application

The Legend of Chalmers is a 2D game where you walk around Chalmers campus Johanneberg, play mini-games and drink beverages to earn *hec*. You will not be able to walk inside building or outside of campus. There will only be about 2 minigames implemented but it will be easy to add new ones.

1.4 Objectives and success criteria of the project

The objective is to create a world map that will simulate Chalmer's campus and to be able to walk freely, participate in mini-games and pick up beverage. The project will be considered done when it is possible for the player to walk around at least some part of the campus and collect *hec*. There should be at least 2 minigames implemented.

1.5 Definitions, acronyms and abbreviations

- LoC = Legend of Chalmers
- *hec* = Higher education credits
- FPS = Frames per second
- NPC = Non-playable character
- Minigame = A small, stand-alone application (game) inside the main application
- Stats = Statistics of the game
- Score = Measurement of progress inside the game

2 Requirements

2.1 Functional requirements

The game will consist of a map with a player on it. The player should be able to move around on the map and interact with it in various ways. One of these interactions should be to pick up items that are spread out on the map. When items are picked up the player will gather points that progresses the game. When the player has collected 300 *hec* the game will be won. Another way to interact with the map is for the player to talk with NPCs that are spread out on the map.

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2.2 Non-functional requirements

2.2.1 Usability

The game should be very easy to play with simple controls that remind of other games in the genre.

2.2.2 Reliability

N/A

2.2.3 Performance

The game should run without any noticeable lag with a render rate of over 30 FPS at all times.

2.2.4 Supportability

The game should be able to run on Mac OS X, Windows and Linux.

2.2.5 Implementation

To achieve platform independency, even over multiple types of devices, the application will use the libGDX framework with Java. Java will have to be installed on the host. The libGDX dependencies will be embedded in the application and won't need to be installed separately by the user.

2.2.6 Packaging and installation

The application and all its dependencies will be packaged into a java package (.jar) and everything that needs to be installed is Java.

2.2.7 Legal

There might be legal issues concerning the music and graphics in the game. This will not be covered here.

2.3 Application models

2.3.1 Use case model

See appendix for use case documents.

2.3.2 Use cases priority

1. Move player
2. Pick up beverage
3. Exit game
4. Dialog with NPC
5. Win Game
6. Interaction with NPC
7. Start Minigame
8. Chug a beer
9. Spill while chugging beer
10. Play caps
11. Move inside cortège
12. Pickup tools inside cortège
13. View statistics
14. Roof fading
15. Skip to next song

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16. Toggle fullscreen

17. Save game

2.3.3 Domain model

See appendix for the domain model.

2.3.4 User interface

The screen resolution is going to be 1024x576, that is 32 tiles in width, and 18 tiles in height giving a 16:9 aspect ratio. There will be a menu where the player can navigate and perform several actions. Menu is hidden by default. Dialogs with NPCs are shown in the bottom of the screen and they are only shown when there is a conversation going on between the player and a NPC. The points are always shown in the top left corner. See appendix for mockup of the user interface.

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APPENDIX

3 Use cases

3.1 Chug a beer

3.1.1 Summary

The player plays a timed BeerChug (øhlhäfv)

3.1.2 Priority

Medium

3.1.3 Includes

Start minigame

3.1.4 Participator

The human player

3.1.5 UC Tables

3.1.5.1 Normal flow of events

#	Player	System
1	Player initiates dialog with an NPC that has the game	
2	Player selects "YES"	
3		The beerchug minigame starts
4		The game prompts the player to push space to start the game
5	The player presses space	
6		A countdown starts
7		The player is prompted to push space to pick up the bottle
8	The player presses space	
9		The game character picks up a beer
10		The player is prompted to alternate pushing the left/right arrow
11	The player alternates pushing the left/right arrow key	
12		The game character chugs the beer, the percentage of drink remaining is displayed in the top left corner
13		The player is prompted to push space to end the chug
14	The player presses space	

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15		The game character puts the empty beer on the table
16		A grade (U,3,4,5) is displayed depending on time
17		The game returns to the main game and adds hec depending on grade (U=0 hec, 3=5 hec, 4=10 hec, 5=15 hec). If the player has already played the game before he will receive points if he got a better grade, however the player can't lose any points and is not able to receive more than 15 hec total.

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3.2 Dialog with NPC

3.2.1 Summary

The game allows for interaction with non-playable characters (NPCs) which typically means a conversation. A dialog with an NPC gives information for the player and sometimes allows for making simple choices.

3.2.2 Priority

Medium

3.2.3 Participators

The human player

3.2.4 UC Tables

3.2.4.1 Normal flow of events

#	Player	System
1	Player stands next to NPC and faces in the direction of the NPC.	
2	The player presses SPACE	
3		The NPC turns to face the player.
4		A message from the NPC is shown to the player in the bottom of the screen.
5	Player presses SPACE to continue the dialog.	
6		The message disappears

3.2.4.2 The message has multiple selectable options

#	Player	System
1		Multiple options are shown for the player
2	Player selects option with UP and DOWN keys.	
3		The selected option is indicated with an arrow ">>" pointing at the option
4	The player confirms the desired option by pressing SPACE	
5		The message disappears
6		The appropriate action is taken based on the selected option

3.2.4.3 If there are more messages after the current one

#	Player	System
1		Instead of the dialog disappearing the next message in the dialog is shown.

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3.3 Exit game

3.3.1 Summary

Allow player to exit the game.

3.3.2 Priority

High

3.3.3 Participators

The human player

3.3.4 UC Tables

3.3.4.1 Normal flow of events

#	Player	System
1	Presses ESC or P	
2		Opens Menu to the left
3		Disables movement
4	Navigates to Exit button	
5		Marks Exit by an arrow to the left
6	Clicks Space or Enter	
7		The application closes

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3.4 Interaction with NPC

3.4.1 Summary

A player can interact with NPC, get items or start a minigame.

3.4.2 Extends

Dialog with NPC

3.4.3 Priority

Medium

3.4.4 Participators

The human player

3.4.5 UC Tables

3.4.5.1 Normal flow of events

#	Player	System
1	Player has dialog with NPC	
2	Player chooses yes option when asked to play minigame	
3		A chosen minigame starts

3.4.5.2 Alternate flow

Player can get items from NPC

#	Player	System
1	Player has dialog with NPC	
2	Player chooses yes option when asked to get items	
3		Gives items to the player

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3.5 Move inside cortege

3.5.1 Summary

Player controls a toolbox that can move in x-axis

3.5.2 Extends

Start minigame

3.5.3 Priority

High

3.5.4 Participator

The human player

3.5.5 UC Tables

3.5.5.1 Normal flow of events

#	Player	System
1		Generates items to be dropped
2	Presses left or right key	
3		Toolbox moves in the pressed direction
4		Generated items go down and disappear when hitting the bottom of the screen

3.5.5.2 Toolbox's left side is hitting the left side of the screen.

#	Player	System
1		Generates items to be dropped
2	Presses left arrow key	
3		Toolbox does not move
4		Items go down and disappear

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3.5.5.3 Toolbox's right side is hitting the right side of the screen.

#	Player	System
1		Generates items to be dropped
2	Presses right arrow key	
3		Toolbox does not move
4		Items go down and disappear

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3.6 Move player

3.6.1 Summary

This is how the player navigates in the world.

3.6.2 Priority

Highest

3.6.3 Participators

The human player

3.6.4 UC Tables

3.6.4.1 Normal flow of events

#	Player	System
1	Presses UP, DOWN, LEFT or RIGHT arrow key.	
2		Player moves one tile in the pressed direction

3.6.4.2 Next tile in direction is collidable

#	Player	System
1	Presses UP, DOWN, LEFT or RIGHT arrow key.	
2		Player stays in the same position but faces the direction pressed.

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3.7 Pick up beverage

3.7.1 Summary

Points (higher education credits) can be earned by picking up beverages placed on various locations of the map. These beverages are collected by the player by walking on them.

3.7.2 Extends

Move Player

3.7.3 Priority

High

3.7.4 Participator

The human player

3.7.5 UC Tables

3.7.5.1 Normal flow of events

#	Player	System
1	Player moves to a tile which has a beverage on it.	
2		A sound is played.
3		The beverage disappears from the tile.
4		Points are gained.

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3.8 Pick up tools inside Cortege

3.8.1 Summary

Player uses the toolbox to pick tools inside Cortege minigame

3.8.2 Extends

Move inside Cortege

3.8.3 Priority

High

3.8.4 Participator

The human player

3.8.5 UC Tables

3.8.5.1 Normal flow of events

#	Player	System
1		Generates tools to be dropped
2	Player moves toolbox under a tool	
3		Toolbox overlaps with a tool
4		Tool disappears
5		Points added

3.8.5.2 Player happens to pick up poop

#	Player	System
1		Generates poop to be dropped
2	Player moves toolbox under a tool	
3		Toolbox overlaps with poop
4		Poop disappears
5		Points subtracted

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3.9 Play caps

3.9.1 Summary

The player can play a minigame version of the drinking game caps, which is popular on Chalmers.

3.9.2 Priority

Medium

3.9.3 Participators

- The human player
- An NPC

3.9.4 UC Tables

3.9.4.1 Normal flow of events

#	Player	System
1	Player initiates dialog with an NPC that has the game	
2	Selects "JA" (Yes) when prompted	
3		The caps minigame starts
4		A cup is displayed and above this a crosshair is moving from edge to edge of the screen
5	The player presses space when the crosshair is directly above the cup	
6		A cap trajectory is rendered and "Träff" (Hit) is displayed on the screen
7	Step 4 and 5 is repeated until player presses space when the crosshair is not directly above the cup. When repeated several time the difficulty will increase by increasing the speed of the crosshair and obstructing the players view, for example by rotating and blurring the screen.	
8	Player presses space when the crosshair is not directly above the cup	
9		A cap trajectory is rendered and "Miss" is displayed on the screen
10		A grade (U, 3, 4, 5) is displayed depending on how many times step 4-5 was repeated.
11		The game returns to the main game and adds hec depending on grade (U=0 hec, 3=5 hec, 4=10 hec, 5=15 hec). If the player has already played the game before he will receive points if he got a better grade, however the player can't lose any points and is not able to receive more than 15 hec total.

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3.10Roof fading

3.10.1Summary

The roof fades when the player walks under it. Players and NPCs are still visible.

3.10.2Priority

High

3.10.3Extends

Move Player

3.10.4Participator

The human player

3.10.5UC Tables

3.10.5.1 Normal flow of events

#	Player	System
1	Player moves under the roof	
2		The roof fades.
3		Player is visible.

3.10.5.2 Player walks away from being the roof

#	Player	System
1	Player moves away from under the roof	
2		The roof is no longer transparent

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3.11 Save game

3.11.1 Summary

The player should be able to save the game's progress so it can be resumed at a later time.

3.11.2 Priority

Low

3.11.3 Participators

Human player

3.11.4 UC Tables

3.11.4.1 Normal flow of events

#	Player	System
1	User presses ESC, P or ENTER key to open menu.	
2		Player interaction is disabled. (i.e. the player can't move or talk to NPCs).
3		A menu is shown in the top right corner and shows menu options in a list format
4	The player selects the save option using UP or DOWN key to navigate the menu.	
5	Player confirms the option using the SPACE key.	
6		Game is saved. Confirmation message is shown and menu stays open.

3.11.4.2 Player is in a non-savable area

#	Player	System
1	User presses ESC, P or ENTER key to open menu.	
2		Game is just paused instead of showing the menu.

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3.12 Skip to next song

3.12.1 Summary

Player can skip current played song.

3.12.2 Priority

High

3.12.3 Participator

The human player

3.12.4 UC Tables

3.12.4.1 Normal flow of events

#	Player	System
1	Presses 'E' button	
2		Skips current song
3		Next random song is played. Same song can't be played twice in a row.

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3.13 Spill while chugging beer

3.13.1 Summary

The player spills and loses while chugging a beer

3.13.2 Priority

Medium

3.13.3 Includes

Chug a beer

3.13.4 Participator

The human player

3.13.5 UC Tables

3.13.5.1 Normal flow of events

#	Player	System
1	The player starts the beerchug minigame, picks up the bottle and starts alternating pressing the right/left arrow key	
2	The player presses the same arrow key twice	
3		An explosion is rendered and "Spill" (Spilled) is displayed
4		The player receives a U grade
5		The game returns to the main game

3.13.5.2 Player false starts

1	The player starts the beerchug minigame and starts the countdown	
2		A countdown starts
3	The player presses space before the countdown ends	
4		An explosion is rendered and "Tjuvstart" (False start) is displayed
5		The player receives a U grade
6		The game returns to the main game

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3.13.5.3 Player tries to end the chug with drink left

1	The player presses space before the bottle is empty	
2		An explosion is rendered and “Spill” (Spilled) is displayed
3		The player receives a U grade
4		The game returns to the main game

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3.14 Start minigame

3.14.1 Summary

A player can start a minigame

3.14.2 Extends

Interaction with NPC

3.14.3 Priority

High

3.14.4 Participators

The human player

3.14.5 UC Tables

3.14.5.1 Normal flow of events

#	Player	System
1	Starts minigame by talking with NPC	
2		Starts new screen with the chosen minigame
3	Plays the minigame	
		Changes screens back to main-game when the minigame is finished

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3.15 Toggle fullscreen

3.15.1 Summary

The player should be able to toggle between fullscreen modes.

3.15.2 Priority

Medium

3.15.3 Participators

Human player

3.15.4 UC Tables

3.15.4.1 Normal flow of events

#	Player	System
1		The game screen is normal-sized
2	Presses F button	
3		The screen toggles to fullscreen

3.15.4.2 Alternate flow

#	Player	System
1		The game screen is in fullscreen mode
2	Presses F button	
3		The screen toggles to normal-sized

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3.16 View statistics

3.16.1 Summary

A player can view the statistics of the game

3.16.2 Priority

High

3.16.3 Participators

The human player

3.16.4 UC Tables

3.16.4.1 Normal flow of events

#	Player	System
1	Presses ESC or P	
2		Opens Menu to the right
		Disables movement
3	Uses arrowkeys to navigate to Stats	
4		Shows what you have chosen with an arrow
5	Clicks Enter or Space	
6		Menu closes
7		Statistics window opens in left upper corner
8	Presses ESC	
		Statistics window closes
		Enables movement for player

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3.17 Win game

3.17.1 Summary

New dialog will be shown when you win.

The game is won when the player has 300 or more hec. The player can still play the game after he has over 300 hec.

3.17.2 Priority

High

3.17.3 Participators

The human player

3.17.4 UC Tables

3.17.4.1 Normal flow of events

#	Player	System
1	Gets 300 or more hec.	
2		Screen with new dialog that says you won
		Disable movement
3	Clicks Enter or Space	
4		Dialog disappears
5		Enable movement
6	Can continue playing	

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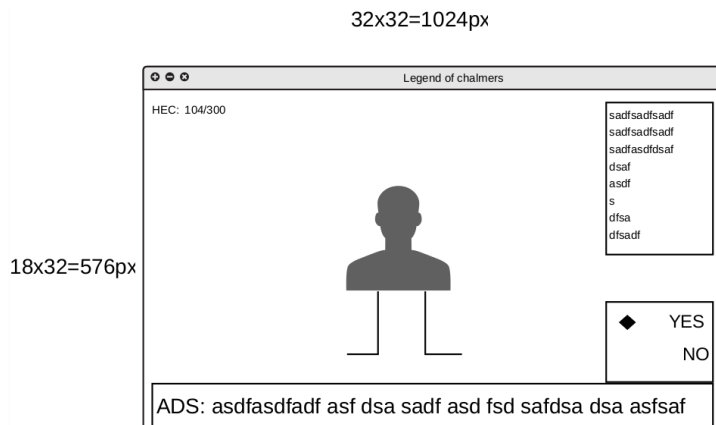
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4 GUI

Mockup of user interface. Also found in “mockup.pdf”.



5 Domain model

Also found in “domain-model.pdf”.

