BILKENT UNIVERSITY

Department Of Computer Science

CS319 - Object-Oriented Software Engineering

Final Report

Game: Terra Mystica

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1.Implementation Process

Implementation process of Terra Mystica started after the deliverance of second iteration of analysis and design reports. In analysis phase, we decided to make the game which can only be played through a computer. Also, the decision of game flow, requirements and gameplay is determined in analysis phase. In the design phase, we decided to use MVC architecture to increase the modifiability and reusability of the components.

The implementation phase started with general user interface classes and controller. Also, classes of model component were implementing. User interface classes and model classes were coded by different team members. Then, each component took some progress, we integrated them to each other. After the integration, each component were progressed together. At every step of implementation, we progressed other step if it works properly.

We faced many problems during the implementation process and spent many hours complementing why some bugs were occurring and how we could get rid of them. One of our main problems was the creating map on the game screen. With many attempts, we found a way to create map. Also, during the integration process, we spent many hours to connect our functions to user interface and model to functions. We created many different classes from our reports during implementation process to facilitate coding. Actually, to make user interface, our decision was to use javafx libraries; however, we benefit from java's own libraries which are graphics2D and realized that it is easier to use javafx.

2.Changes and Improvements

2.1 Changes and Improvements in Design

In design report, we mentioned that we will benefit from javafx libraries to make user interface. However, javafx may result in with some issues since it is not one of the libraries of java. Installing it and setting it up may sometimes causes errors. Because of our limited time, we used Graphics2D. Also, none of our functions is static; however, we realized that some of instances are needed to be created and functions run before initialization. In design report, we emphasised that player will be the only class which will be connected to game manager; however, during implementation process, we saw that controller needs to reach other classes.

2.2 Cult Screen Improvement

Our first decision was to show players cult improvements by numbers on their resource page; however, we decided to show cult track on different screen since it is the significant part of the game and players should see it in detail. On this page, each player can see their own and other's cult advancements. Also, they are able to see cult spaces.

2.3 Other Player's Resource Page Improvement

Player can see their resources and advancements on their resources. However, they also need to see others advancements and resources. They can see advancements on games screen via map and cult screen but they were not able to know others resources; that's why, we added other players' resources

pages on the right side of the game play screen. With this feature, they are able to make different strategies by others resources.

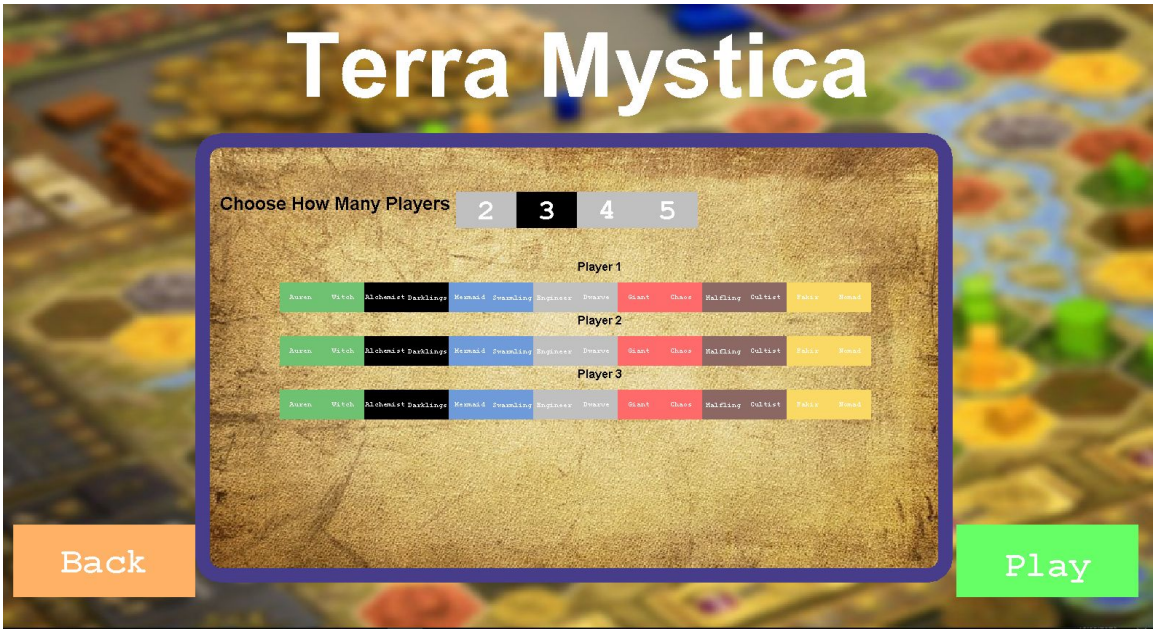
3. User's Manual

a. Main Menu Screen

This screen shows what player see after open the game.

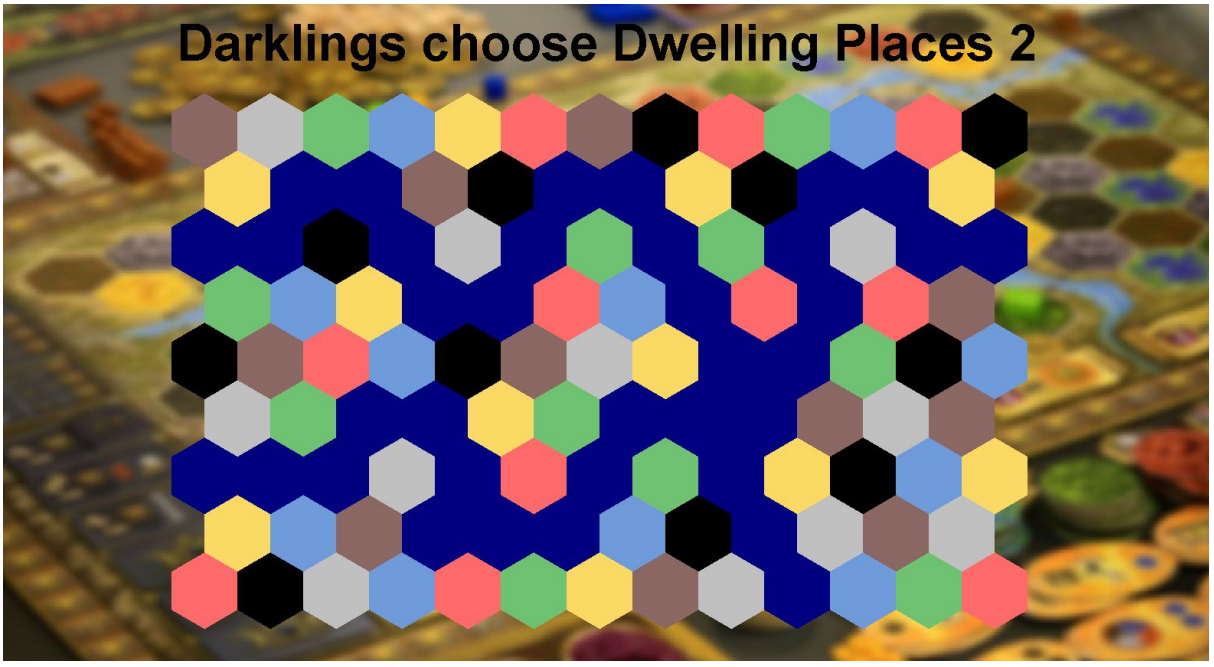
b. Selection Screen

This is the screen that is shown after a player clicked the play game button. On this page, number of players is selected first then each player chooses their factions.



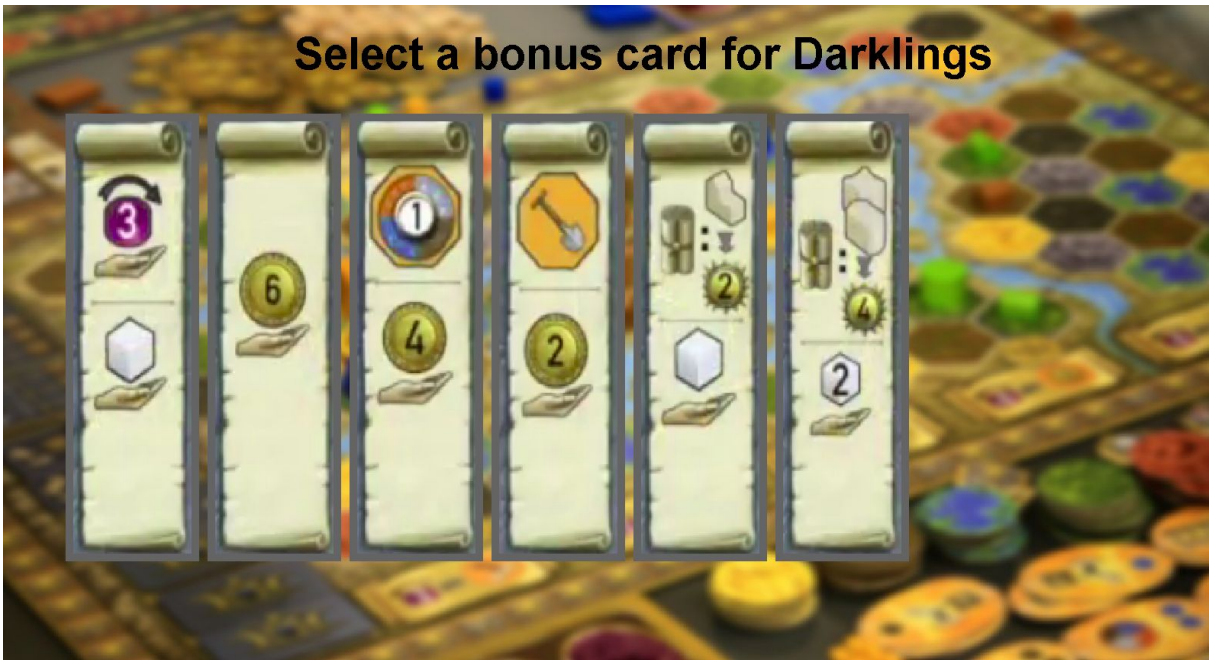
c. First Dwelling Screen

This screen shows the map which players place their first dwellings. They can only place their dwellings to their home terrains.



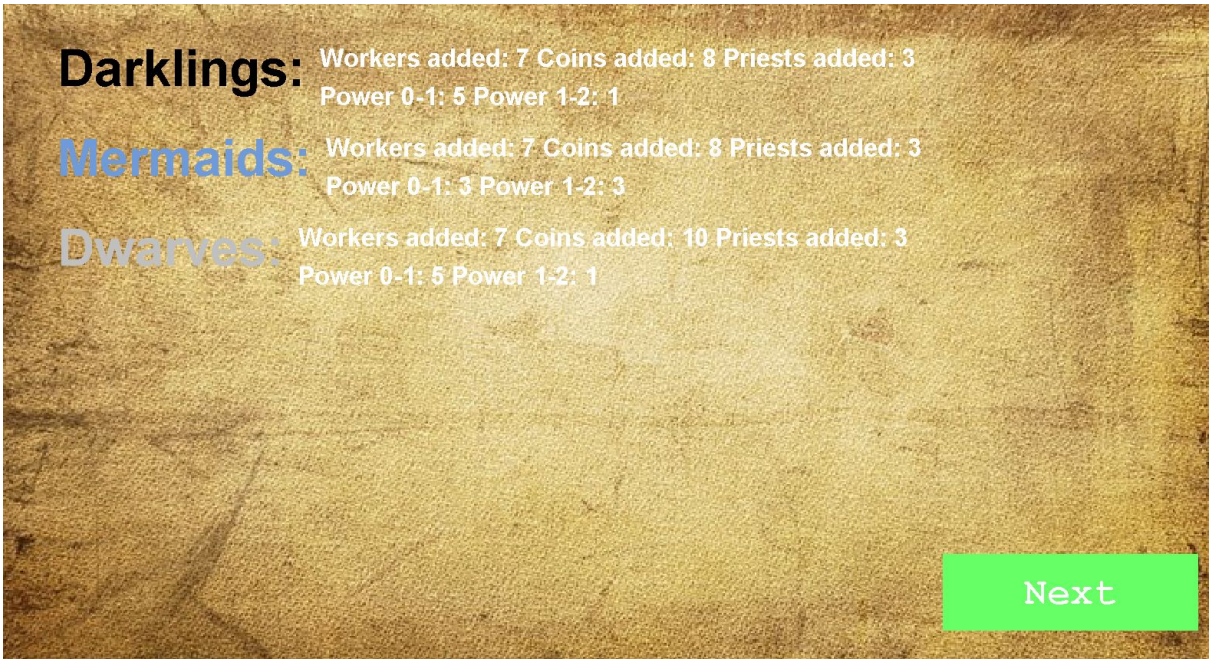
d. Bonus Card Screen

This screen shows the bonus cards which will be chosen by players at the beginning of each round.



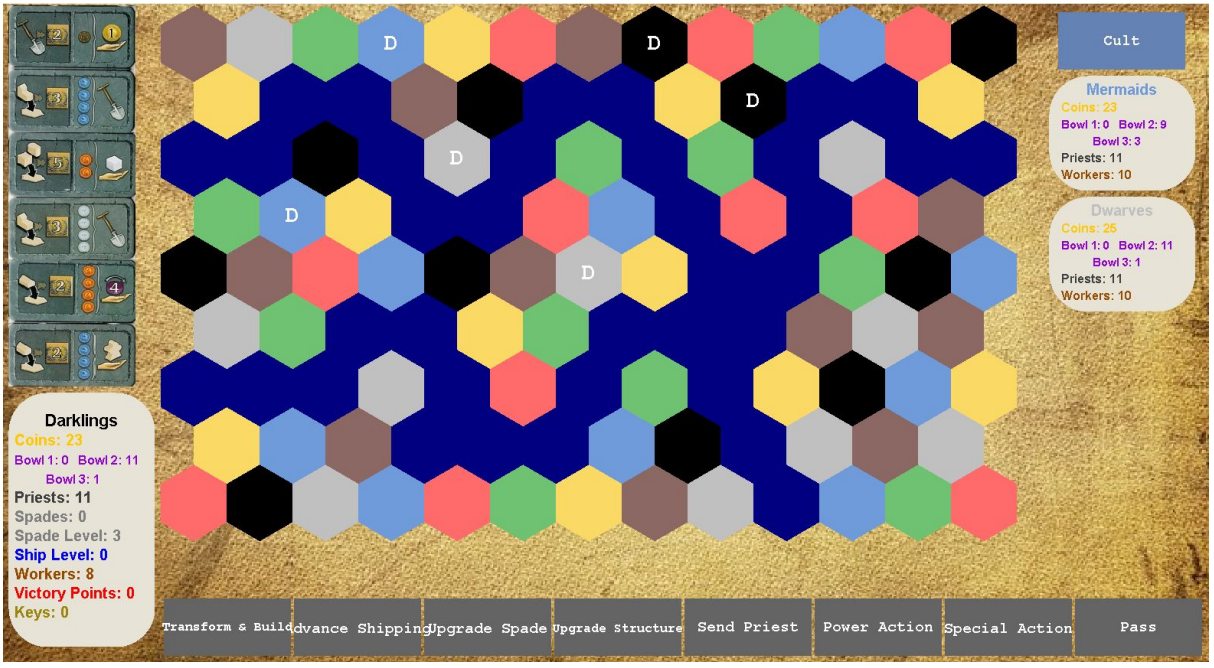
e. Phase 1 Income Screen

This page is to show how phase 1 is completed. They earned income by game rules automatically.



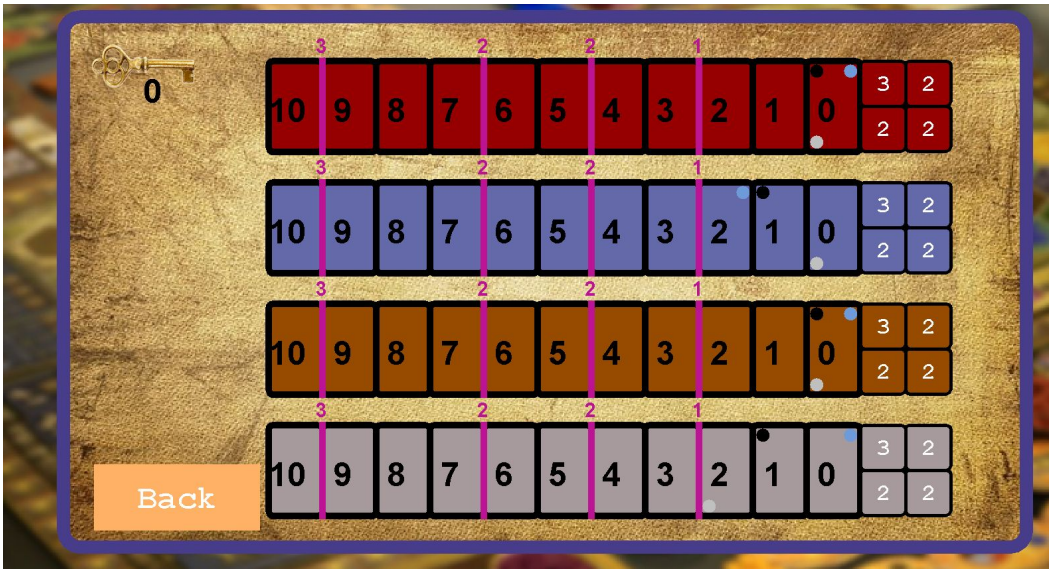
f. Main Game Screen

This is the screen which is displayed at the beginning of phase 2. Players can do eight different actions and can see their own and other players resources. Also, they can see the map of the game.



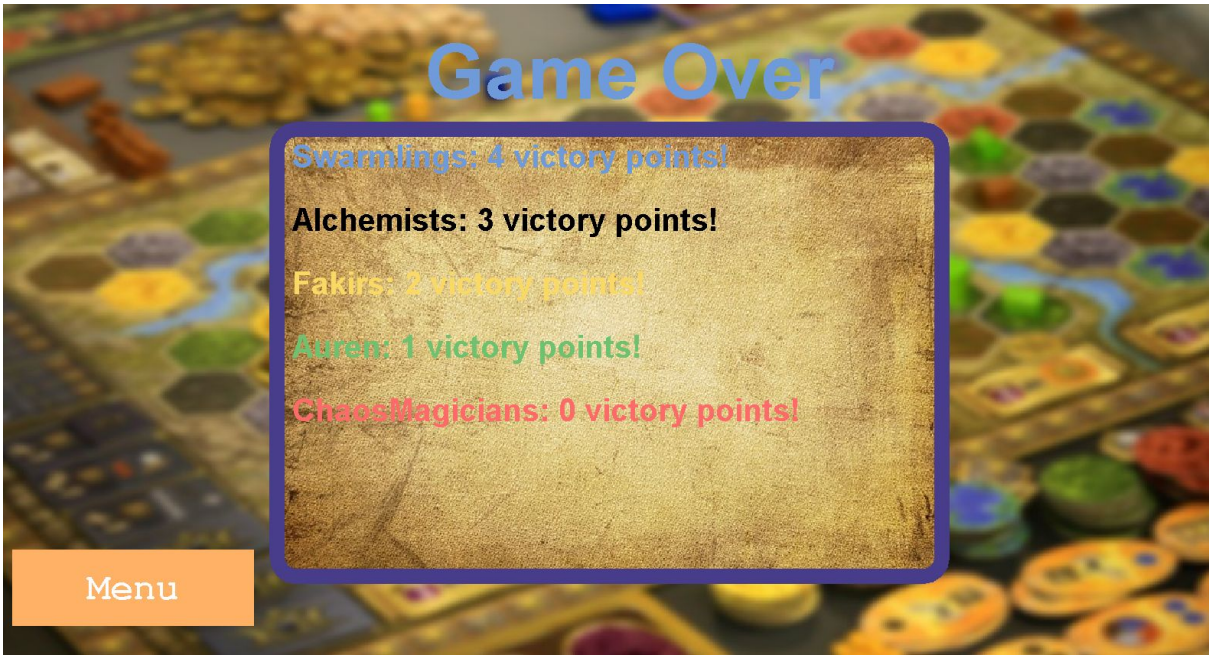
g. Cult Screen

This is the page which show the cult advancements of each player by dots. Also, when a player send a priest to one of the spaces of a cult. This space color is changed by the player's home terrain color.



h. Game Over Screen

This page is the game over page.



4. Work Allocation

- Ege Hakan Karaağaç: In analysis reports, he prepared the sequential diagrams and class diagrams. He also prepared the class diagram of Terra Mystica for design reports. During the implementation process, he was responsible with user interface; however, he also implemented some of controller subsystem.

- Berdan Akyürek: In analysis reports, he prepared mock ups of the game. He wrote some explanations about classes for design reports. During the implementation process, he was responsible with user interface; however, he also implemented some of controller subsystem with Ege Hakan Karaağaç.

- Ömer Olkun: He wrote explanations for some of class diagrams in design reports.

- Aziz Ozan Azizoğlu: For analysis reports, he wrote the overview of the game except faction. He wrote some explanations about classes for design reports.

- Fırat Yönak: In analysis reports he prepared activity and state diagrams, both functional and nonfunctional requirements and explanations of faction's. For design reports, he wrote everything except class diagrams and their explanations. During the implementation process, he implemented the model subsystem and some of controller subsystem parts.

5. Step by Step Implementation

- Create GameManager class to control everything in the game.
- Create GamePlayManager to provide actions and phases in the game.
- Create Display class which is the main class of user interface and manages other user interface classes.
- Create DisplayPanel which is the main panel class includes general screen view. Other view classes extends it.
- Create other user interface classes to complete user interface.
- Use Graphics2D to make user interface. Its render function draw the user interface whenever a user make an action.
- Implement Player class which stores every data of players.
- Implement faction classes that each of them has different features.
- Create tile classes which provides different resources or advancements during game.
- Integrate GamePlayer functions with user interface to provide gameplay.
- Integrate controller subsystem with model subsystem to reach data of the game.
- Integrate view component with model component to update data of the game.