Software Engineering
Project Report

Lithos

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I Project Description

1 Project Overview

Lithos is an interactive multiplayer strategy game in which the user plays the role of a tribal leader who tries to overcome various obstacles in Prehistoric Age. The game aims to add educational value to gaming environment by helping the player learn Prehistory as he/she progresses through various levels of the game.

2 The Purpose of the Project

2a The User Business or Background of the Project Effort

The idea of playing a game assumes that the individual is engaging in that activity by choice. What if a game can be used as a means of recreation as well as instruction? Lithos is the answer to that question – it is intended to teach the user about the events of Prehistoric Age in an engaging gaming environment, essentially providing the user with "edutainment".

are

In 21st century, less number of individuals is aware of the foundation of human evolution and history. Many games that are designed to educate the user in history concentrate on the amusement aspect of the game and compromise on historical accuracy by showing some anachronisms. The game Lithos focuses on being informative and accurate as well as entertaining. The key idea of Lithos is to teach individuals about Prehistory and preserve the knowledge of development of humanity for future generations.

2b Goals of the Project

The goal of the project is to educate high school students and other interested individuals about the Prehistoric Age in human evolution.

The motivation behind Lithos is to convey Prehistoric chronology of events to youngsters and help them to understand how early humans handled situations such as threats, hunger and hardships.

Examples

The user must be able to know the facts and features of the particular era after completing the corresponding level in chronological order. For instance, if the user completes the level corresponding to Paleolithic age, then he/she must know about thedevelopments that occured in that period of time like the discovery of fire, wheel and sartorial realization.

2c Measurement

In schools, the success of the product can be measured by checking the performance of students in the quizzes within the game and the actual Prehistory quizzes conducted in their respective classes. If the performance of the students improves through this game,

then that particular school will recommend it to the rest of the schools which helps in growth of potential customer base for the product.

In case of the individuals that play the game due to their interest in knowing about Prehistory, the success can be measured based on the number of hours of game play, the number of shares of the quiz scores and game progress to their friends. The average customer rating can also be used to measure the success of our product.

3 The Scope of the Work

3a The Current Situation

Existing prehistoric games like 'Flintstones',' PreHistoric Tribes' mainly focus on engaging the user rather than educating the user about the facts of prehistory. These games also tend to distort the facts for the sake of making the game more interesting. Also, they concentrate on only one period in the Prehistoric Age, so user will not be able gain an in-depth knowledge of how the initial tribes made it to the established civilizations.

Our game focuses on engaging the user as well as educating him/her about the different strategies used by the early tribes to survive the unfavorable conditions. Lithos also takes into account the exact chronology of events, discoveries and behavioral advancements in early tribes.

3b The Context of the Work

Examples

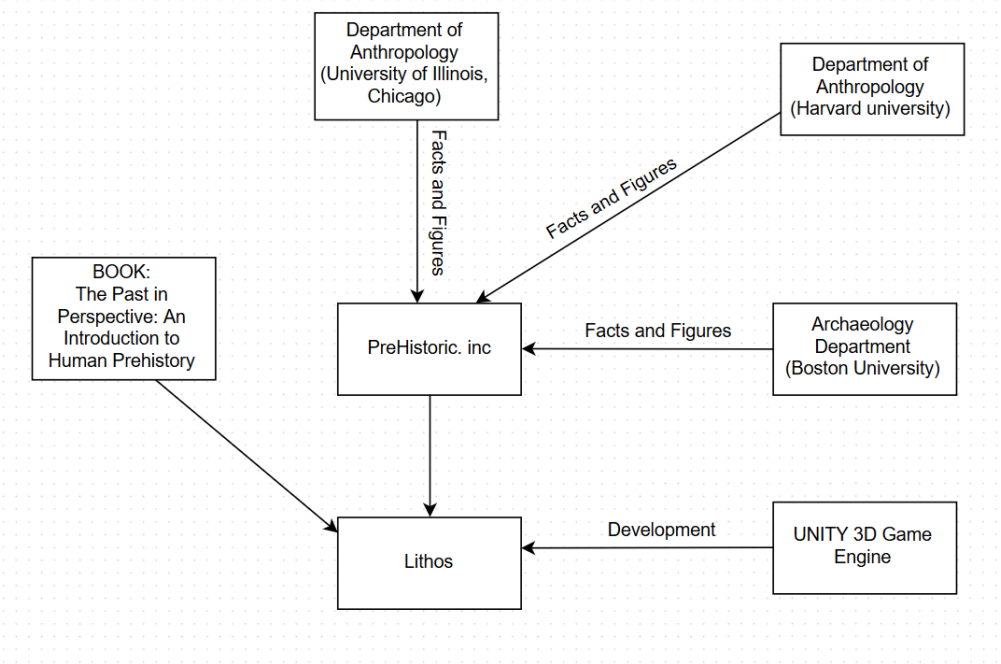


Figure 1 – Context

3c Work Partitioning

EVENT NAME	INPUT AND OUTPUT	SUMMARY
Game Loading	Input - .exe file Output- Game Home Screen	Loads the game in
Display Main Menu	Input- User choice from the set of options available Output- Redirection of the game accordingly	The Main menu is shown at the startup which enables the user to choose from the different set of game options, like controls/ ??
Level Ups	Input- Successful completion of the previous level Output- Next Level Screen	Goes to the next level when the previous level goals are achieved and the ??
Show Clues	Input- The user's current difficulty Output- Help tips to take the player further in the game	If the user gets stuck at some point or the player takes more time to realise his next move, the hints start popping up
Show Notifications	Input- The user's current status in the gameplay Output- The appropriate notification	Whenever there is a need to inform the user of his progress in the game/ if he is running on low resources, notifications are shown

Table 1 - Work Partitioning

3d Competing Products

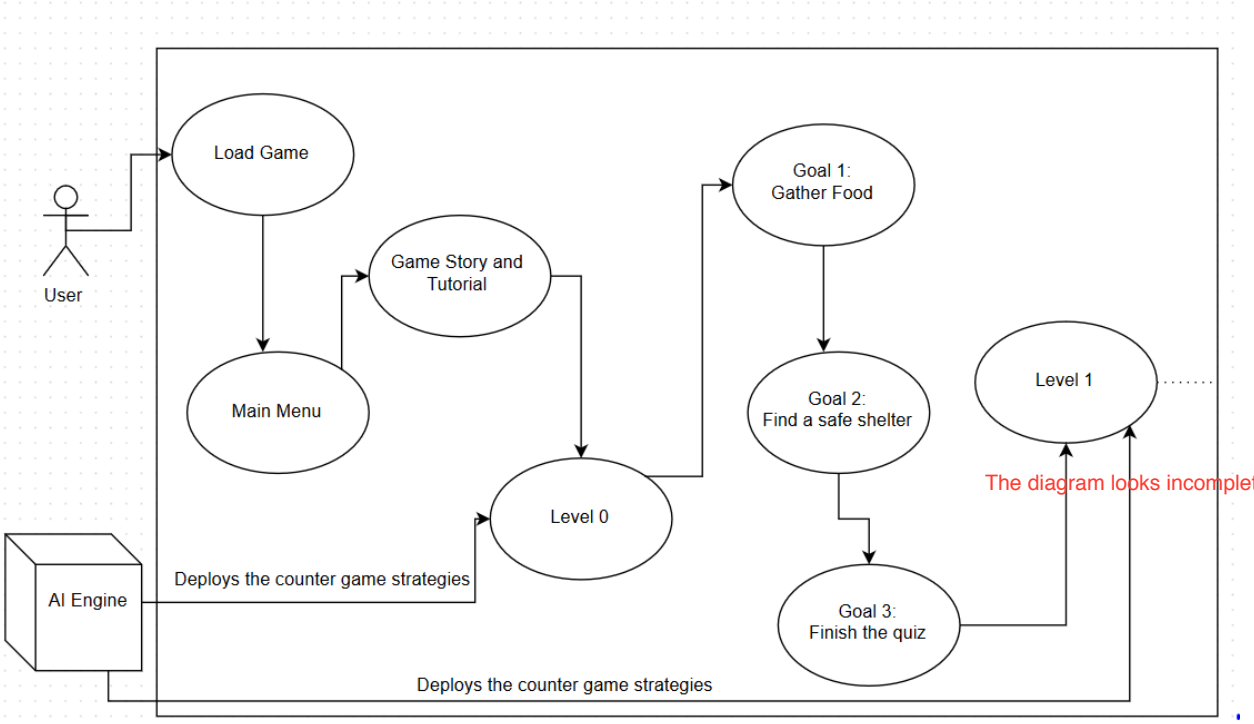
Games like "Flintstones" and "PreHistoric Tribes" belong to the same genre of games, but they compromise totally on historical facts, there by degrading the educational value. For instance, in Flintstones early humans co-exist with dinosaurs – this is a historically inaccurate event and there by misguides the user. Lithos solves this by providing the user with accurate prehistoric information which is collected from trusted sources (PreHistoric Inc.).

4 The Scope of the Product

Lithos is a strategy game that will be developed for a PC platform, but it can be potentially ported to a gaming console or even a mobile device that would meet the hardware requirements. The hardware that would interface with the game will be a mouse, a keyboard and/or a controller. The product primarily targets gamers, as well as individuals who are interested in the historical content provided in the game and are looking to explore gaming. The main goal is to make the product available

through a gaming platform/website such as “Steam”, since it is the best way for the game to gain popularity and maximize revenue.

4a Scenario Diagram



Is the AI engine external to the game? if not then it should not be outside the box!!

Figure 2 - Scenario Diagram

4b Product Scenario List

1. Launch Game
2. Single Player
3. Multi Player
4. Manage Resources
5. Explore Levels
6. Level-up quizzes

Incomplete?!

4c Individual Product Scenarios

1. **Launch game:** The game is launched by double clicking on the executable file. If the launch takes time, then a progress bar pops up, which assures the user that progress is being made. The game starts off with a main menu which has a captivating background and multiple options like Choice of player, New Game, Load Pre Existing game, Settings, Help and Exit. For example, if the user clicks on Load Pre Existing game, then it will allow the user to load the pre saved file. Settings has an option to control screen size, volume, user profile, mouse settings, key board controls, camera settings and other input device settings. Exit is a typical log out set up when the user has to confirm about saving the current game and exiting.

2. **Single Player:** If the application is used in a single player mode, the user will be playing against an AI generated characters that will try to beat the user through his quest to create civilization. The opponent capabilities can be adjusted to different levels depending on the needs of the user. As the user progresses through the ages, the AI generated characters become more skillful and crafty as well making it harder for the user to achieve his goals.

3. **Multi Player:** Lithos will also allow for a multi-player mode by allowing multiple players to use the application by connecting to the AI engine through internet. The AI engine will look for players online who are at the same skill level and it gives recommendations to the player to conquer or form alliance with other player's tribe.

4. **Manage Resources:** User will have certain resources for his disposal, such as food, water, and other basic ones needed to start. The game progresses based on the amount of resources a user maintains and this is monitored through a set of meters.

5. **Explore Levels:** The game progresses to the next level after completing a set of challenges. Additional challenges that are historically accurate are unlocked with each new level. For example fire becomes available to the user immediately after completing the Level 0 (Lower Paleolithic Age) and fire has to be used to complete the challenges in level 1.

6. **Level-up Quizzes:** After achieving the challenges specific to a level, the user is tested on historical knowledge gained in that level through a series of questions. Successful completion of the quiz is mandatory for progressing to the next level.

5 Stakeholders

5a The Client

The client is LITHOS.INC, which is a company that is focused on providing path breaking practical experience to people who want to learn history, especially concentrating on prehistoric events through edutainment.

5b The Customer

The intended customers of this product are all schools that teach history to students. It will also be available to enthusiastic people who want to learn about prehistoric events. To be particular, this product will improve the knowledge of students considerably as the product teaches in a both engaging and informative way.

5c Hands-On Users of the Product

The end users of the product are high school students. Students will play the game Lithos and gain knowledge in Prehistory. Other hands-on users would be the teachers who test the knowledge obtained by the student and constantly monitor them.

Students: Students who play Lithos will gain knowledge regarding the prehistoric life of humans and the events in Prehistory in a chronological order through a level by level approach. Students will learn a lot of information about how early humans used to think in case of need, how they thrived in harsh environment and overcame the hurdles.

Teachers: The game Lithos displays a quiz at the end of each level and the players are required to answer the questions satisfactorily to move on to the next level. It is the role of the teachers to monitor quiz performances of the students and gain an overview of how much students have learnt from the game.

5d Priorities Assigned to Users

- **Key users:** Students (80% of the users)

This game is used by students to gain knowledge in Prehistory – this should be done in entertaining yet informative manner.

- **Secondary users:** Teachers (10% of the users)

Teachers use this application to get an overall view of students' performance in game quizzes and in class.

- **Other users:** Sales and Admin (10% of users)

Individuals who seek to learn more about Prehistory will use this game for this purpose. Representatives and administrators use this product for deploying and maintaining the product sales.

5e User Participation

There will be very less participation of the primary user as he/she gets educated from the software, but there is a very good scope for the secondary users to assist product developers by giving few insights on the improvement of the product.

What about the participation of other users??

5f Maintenance Users and Service Technicians

Very minimal software management is required. Lithos Inc. will offer product maintenance for a small fee on any errands that may arise in the future.

5g Other Stakeholders

- **Statisticians, Economists**: These stakeholders are essential for growth of the product as they analyze the sales of the product and provide an insight into the economic standards of the company and product.

- **Lawyers:** For any infringements and copyrights regarding the product, these stakeholders take care of the security issues related to the product.

6 Mandated Constraints

6a Solution Constraints

Constraint 1:

Description: The game should use accurate information about prehistoric timeline.

Rationale: The game is meant to teach history, so any false information concerning historical facts embedded into the game will not result in the product being what it was meant to be.

Fit Criterion: The game's content is built on the historical data which is provided by the corporation PreHistoric Inc. whose task is to research on prehistoric age.

How is that a fit criterion?

Constraint 2

Description: The game should be highly engaging and easily comprehensible.

Rationale: This game's intent is to teach prehistoric facts and as most of the users are high school students, it is a must for the game to be both educating and engaging.

Fit Criterion: This game is built on a very popular game development engine "UNITY 3D", which has an improved set of development tools in it that helps the game to achieve its intent.

This isn't a fit criterion either. Probably the metric of number of satisfied users or the ease with which say 90% of the users can play the game can be a fit criterion.

6b Implementation Environment of the Current System

The game runs on Windows, Mac OS X and Linux. Even though the main market these days is Windows, the company plans to increase the customers in future who use both Mac and Linux for profits and popularity. It also connects to an online game server for multiplayer mode.

6c Partner or Collaborative Applications

This game does not collaborate with any other applications at the initial stage. But as the levels progress, it enters a multi-player mode which connects the player to the online game server (player match making app). The user can then compete against other players or collaborate with them as needed.

Read the description in the volere template. Collaborative applications are the other apps you might collaborate with for the functioning of your product

6d Off-the-Shelf Software

This game doesn't use any off-the-shelf software.

6e Anticipated Workplace Environment

As this game has some educational value attached to it, it is mostly played by students in schools or individuals that are interested in learning Prehistory. The system that runs the game allows the player to use a headset in order to avoid inconvenience to his immediate surroundings. The user can even play it on his personal computer according to his preference.

6f Schedule Constraints

The game is supposed to be developed by a team within 3 years of receiving the final report. As the target audience is exposed to the ever changing scenario of graphical world, it is essential that the game must be deployed in the timeframe defined so that it competes with the present day graphics.

6g Budget Constraints

As this game requires a lot of resources, the budget estimation is not fixed and will change depending upon the scenarios. This is undetermined as of yet.

7 Naming Conventions and Definitions

7a Definitions of Key Terms

Stone Age: This is the first stage in the prehistoric chronology of events.

Paleolithic Age: This is the first stage in the Stone Age that is further divided into 3 stages mentioned below.

Lower Paleolithic: This is the first stage in Paleolithic Age where early humans focused on basic needs like food and shelter, i.e., survival.

Middle Paleolithic: This is the second stage in Paleolithic Age where early humans focused on needs like Clothing and this stage also marks the discovery of fire.

Upper Paleolithic: This is the third stage in Paleolithic Age where early humans focused on strategic usage of fire for cooking, dealing with threatening animals and providing warmth.

Mesolithic Age: This is the second stage in the Stone Age where early humans learnt skills like stone carving and land technology.

Neolithic Age: This is the third stage in the Stone Age where early humans learnt techniques of agriculture and taming animals.

Bronze Age: This the second stage in the prehistoric chronology of events where skills like trading using barter system, invention of Potter's wheel and navigation got developed.

Iron Age: This is the third stage in the prehistoric chronology of events where the people have started using Iron to make weapons.

7b UML and Other Notation Used in This Document

This document generally follows the Version 2.0 OMG UML standard, as described by Fowler in "UML Distilled", Third Edition, Boston: Pearson Education, 2004.

7c Data Dictionary for Any Included Models

Not Applicable at this point of time.

8 Relevant Facts and Assumptions

8a Facts

- Stone Age is the earliest known age.
- Lower Paleolithic age dealt only with humans searching for food and shelter.
- Middle Paleolithic age is where humans have little knowledge about clothing.
- Fire was discovered in the middle Paleolithic age due to natural lightning.
- The first metal, Copper was known to humans in early Bronze Age.
- Humans learnt about alloys in middle Bronze Age.
- People started using Iron for weaponry in the Iron Age.

8b Assumptions

- The game targets the PC platform since it has become the most popular platform for gaming.
- Internet connection is required on the users' end to play in a multi-player mode.

- PC hardware is getting cheaper allowing for more people to purchase their own gaming machines and high end PCs.
- The game is historically accurate and presents the facts in the correct chronological order
- The game should attract both dedicated gamers and casual gamers and it should gear towards all age groups.
- The game will be available for all Desktop platforms (Windows, Mac, Linux)
- The game will be programmed using the game development engine "UNITY 3D".
- User data will not be released, i.e., confidential and always be kept for internal purposes.
- A basic prototype showcasing the look and feel of the game should be released within the first three months.