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Feasibility Analysis Report

Version 1.2

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**Key Word**

Chinese chess, 3D game, multi-player

**Abstract**

The project is about Chinese chess game. Five modules are included: Basic logic module, Artificial intelligence module, Network connection module, Game mode module, and 3D effect module.

This document is to measure the feasibility of this proposed framework.

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# Introduction

## Propose

The project aims at designing a multi-player 3D Chinese chess game. In order to develop a game with high immersion characteristic, a lot more works are evolved in addition to the basic logic part, for example, optional game modes, user-friendly game scene, and interaction with other players.

## Background

Game Name: Chinese Chess  
Task presenter: Shi Yu, Lu Hao, Wan Chengcheng, Cao Yifeng  
Developer: Shi Yu, Lu Hao, Wan Chengcheng, Cao Yifeng

## Definition

AI: Artificial intelligence

## Reference

Unity3D official documents

# Presupposition

## Requirement

1. Functional requirements

1. Man-machine game and artificial intelligence.

2. Man-man game and Internet connection.

3. Optional game modes.

4. 3D effects.

1. Non-functional requirements

It should be robust, user-friendly, portable and extensible.

1. Inputs

User operations and network communication information.

1. Outputs

3D game scenes and network communication information.

1. Workflow

Refer to 4.2 in detail.

1. Deadline

The whole system should be completed on the end of December.

## Objective

Provide chess game with high immersion characteristic.

## Condition, Supposition and Limitation

1. Minimum life time of system: 3 years
2. Time to select suitable solution: 1 week
3. Conditions of developing/run-time environment in hardware and software

Hardware:

1. Personal computer.
2. Minimum runtime memory requirements: 128M
3. Hard disk space for installation: 50M.

Software:

Mac OS X, Windows 7/8

## Feasibility Analyzing Method

1. Potential user survey
2. Experts consultation
3. Market survey of similar or relevant products

## Evaluation Criteria

The criteria of evaluating the system are: functions supported or provided by the system, time cost to develop the system, and the usability of the system.

# Existing System Analysis

Chinese chess is a classic game. However, most of them only simulate real world scenes and have little innovation.

## Workflow and Dataflow

## Working Load

Working load is extremely slight, since AI is quite simple.

## Expenditure

Most expense is spent on personnel.

## Personnel

Usually is a mini team.

## Devices

Personal computers or mobile terminals.

## Limitation

These games usually are not appealing enough to attract users.

# Proposed System

## Introduction to the Proposed System

The proposed system adds fancier game interface and more game modes, including time mode and obstacle mode. In addition, the system supports both man-man and man-machine games. The system is based on 3D.

## Workflow and Dataflow

## Improvement

The proposed system has more functions, better interface, and high immersion characteristic.

## Impact

### Impacts to the Devices

The device should have access to network.

### Impacts to the Software

The scale of software package increases.

### Impacts to the User

Better user experience.

### Impacts to the Run-time Process

The proposed system has greater computational complexity.

### Impacts to the Development

Unity3D is involved.

### Impacts to the Location and Equipment

Almost no impacts.

### Impacts to the Expenditure

No extra expenditure.

## Limitation

The system has obstacle to be deployed on mobile terminals.

# Alternative Solution

For the time being, there is no alternative solution.

# Cost/Benefit Analysis

## Cost

### Cost for Infrastructure

a) Hardware Devices:

1 or more Personal Computers

1 Game Server

Storage (Array Disk, Compact Disk)

b) Software:

Unity3D by Unity Technologies.

MonoDevelop by Unity Technologies.

Adobe PhotoShop by Adobe Systems.

Microsoft Office by Microsoft.

Etc.

c) Necessary place to locate hardware device

d) Cost of fixing hardware and software

### Other Cost for One-off Investment

* + - 1. Requirement Research & Design Research
      2. Develop Plan Research & Measure Criterion Research
      3. Cost for start project
      4. Cost for technology management
      5. Training Fee

### Non-One-off Investment

* + - 1. Software rent and cost to maintain
      2. Cost of data storage
      3. Cost of the communication between team members
      4. Public facility expense
      5. Other necessary usual expense such as the electric expense

## Benefit

### One-off Benefit

N.A.

### Non-One-off Benefit

* + - 1. The new hardware device and software imported can be reused in the coming projects.
      2. The experience in this project can be used in the similar projects.

## Cost/Benefit Ratio

Project cash flow projection

|  |
| --- |
| Year Project |
| 0 -¥ 1000 |
| 1 ¥ 1000 |
| 2 ¥ 700 |
| 3 ¥ 700 |
| 4 ¥ 500 |
| Net Profit ¥ 3900 |

## Investment Return Period

Concerning the cash flow analyze and our experience in similar project, we suppose we can have profit in about 1 year. So the investment return period is 1 year.

## Sensitivity Analysis

N.A.

# Other Social Factors

## Law Based Factors

The software for developing is authorized edition.

## Usability Based Factors

The personal computer is wide spread and thus the system can be easily attached.

# Conclusion

The system is feasible to be developed.