# Fire Will Kill Us All

## Project Plan

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# Project Statement

Renown event management IT company Flying Hippo Entertainment has been tasked to create a software solution. "Fire Will Kill Us All" is an application designed for business owners who wish to know whether their businesses are placing their fire extinguishers in the best place to prevent damages.

Users will be able to recreate their desired floor, from the number of people in the rooms to the materials of the furniture found in them. The simulation will take into consideration things like human factor (when and if a person reacts to the fire) and flammability of rooms when determining the spread of a fire. The final answer given by our algorithm will be modeled after a high enough number of repetitions in order to give a statistically relevant outcome.

If time allows the team will work on the development of a neural network for interpreting the data gathered from the simulations and providing useful information regarding the positioning of the fire extinguishers.

The team wishes to code the back end of the application in C#, user interface in a Windows Forms Application and the visualization in the Unity Engine.

The following documentation, which on conclusion will be agreed upon and signed by both parties to provide the necessary legal liability for everyone involved in the project, will describe the decision making process of our team of experts and give an insight on their design choices.

# Formal Client

Chung Kuah is our client for this project, he will also be acting as our tutor.

Contact info:

Name: Chung Kuah

Email: c.kuah@fontys.nl

Phone: +31885074156

Location: R1 2.41

Working days: Monday, Tuesday, Wednesday, Friday

# Team

The Flying Hippo Entertainment board unanimously voted to assign the project to its most seasoned team, responsible for internationally acclaimed software series PCS, composed of titles such as "PCS1-Exam: And yet it compiles" and "PCS2-Exam: The System.NullReferenceExeption mystery". Further accomplishments include PCS3, PSC4, as well as the infamous Pro-P.

The team consists of:

Atanas Marchev (3437930)

Filippo Nardocci (3437825)

Nikolai Ganev (3270823),

Yosif Kiradzhiev (3442659) - CEO of Flying Hippo

Stef van den Tempel (3350991)

Contact information
Name: **Yosif Kiradzhiev**

Email: y.kiradzhiev@student.fontys.nl,

# Problem description

The team is tasked with creating a single complex application. The aim of the software solution is to provide its users with information about the placement of fire extinguishers. The program will rely on a complex algorithm, which will run multiple simulations of an unexpected fire scenario and will determine which placement of the extinguishers results in the most efficient resolution of the fire.

# Project goals

The goal is a software solution for the client what can predict the optimal location of fire extinguishers. The software solution concludes:

- The simulation of the fires is visualized in unity. The simulation is a floor where one or multiple fires appear. The user can also manually start fires to interact with the simulation. This simulation will output the survival rate based on the people and the extinguishers.
- A neural network that will determine the optimal locations for the extinguishers. - (May be left out or changed)
- A GUI where the user can start fires. The user can also see the base map and some results.

# Deliverables

The team is going to use the Agile methodology split into three milestones with corresponding deliverables. They will <u>NOT</u> be making use of a database instead the application will output results in a log file stored on the local machine.

# Functional Deliverables

- Application - The application takes in locations of the fire extinguishers the user sets and runs one simulation and outputs the results.
  - Graphical interface
    - Windows form application
    - Unity visualization
  - Simulation

# Non-Deliverables

- Database - there will be no database connected to the application.
- User manual - the application will not be packaged with a manual.

# Constraints

The team will be working on C# windows forms applications and Unity game engine. Time is limited to 19 weeks, the first iteration will be 5 weeks, the second one - 3 and the third - 3 again with one calibration session between Iteration 1 and 2.
The team will hold a weekly meeting with the tutor on Tuesdays.

# Risks

**Team runs out of time**
Team does not have time to finish project because of other courses and projects
**Probability:** Medium
**Impact:** Team delivers an unfinished product.

# Project Phasing

## Work breakdown structure

Kick off phase
**Week 1 Activities:**
Startup / Form groups
Come up with a proposal for an application
Research the to-be implemented algorithm/application
Create draft of project plan
**Deliverables:**
Concept version of project plan • Proposal for an application

**Week 2 Activities:**
Basic research
Update concept version of project plan
Creating issues on git
**Deliverables:**
First batch of issues on git • Final version of project plan

## Initial phase

**Week 3 Activities:**
Discuss project plan
Create concept version of plan for iteration 1
Updated version of git issues
**Deliverables:**
Updated version of git issues
Concept version of plan for iteration 1

**Week 4 Activities:**
Discuss git issues & plan for iteration 1
Updated git issues & plan for iteration 1
Create work division report
**Deliverables:**
Final version of plan for iteration 1
Updated version of git issues
Work division report

## Iteration 1

**Week 5 Activities:**
Present git issues to you tutor
Discuss
Update git issues
**Deliverables:**
Updated version of git issues

**Week 6 Activities:**
Code
Create concept version of plan for iteration 2
**Deliverables:**
Concept version of plan for iteration 2

**Week 7 Activities:**
Code
Debug
UML Class diagram(s) & sequence diagram(s)
Update work division report
**Deliverables:**
Final git issues for iteration 1
Final version of plan for iteration 2
Source code of proof of concept
Proof of concept
Updated version of work division report

**Week 10 Activities:**
UML Class diagram(s) & the non-trivial sequence diagram(s)
**Deliverables:**
UML Class diagram(s) & non-trivial sequence diagram(s) of proof of concept

# Milestone 1

First iteration will deliver a working application consisting of the simulation and the output of one simulation run. The floor layout will be static. And the user can interact with the simulation by adding a fire to it.

# Milestone 2

The second iteration will focus on a more accurate and statistical result by using the simulation more times and giving out statistics about the placement of the extinguishers with a potential implementation of a simple neural network.

# Milestone 3

Third iteration will be polishing the application, graphical representation, Unity and catching up with work left out from earlier milestones.