

# Projects Requirement Specification

# Escape the Innovation Center

## Software Requirements Specification



Image 0.1

### **VIRTUOSO**

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August 31st, 2025

Version 2.0

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# 1. Introduction

Location specific online escape rooms are a great way for organizations to market themselves and provide a fun activity for general use. Many colleges offer online escape room experiences like the University of California, Santa Barbara’s “Escape UCSB Library” experience or Dartmouth College’s “Escape the Outdoors” game. We want to build a similarly themed experience to drive excitement about the ground breaking computer science education and research being performed at the University of South Carolina Innovation Center and to simultaneously provide a unique, entertaining experience for University of South Carolina Computing students. Our escape room will present users with a series of puzzles all based in the M. Bert Storey Engineering and Innovation Center. Students will recognize the references to features of the Innovation Center like their classrooms, the faculty, and the other nooks and crannies of the building.

## 2. Stakeholders

1. Computer Science Learners.
  - 1.1. Carolina Students.
  - 1.2. Students attending other Universities.
  - 1.3. Learners who do not attend Universities.
2. All University of South Carolina students.
  - 2.1. Undergraduates
  - 2.2. Graduates
  - 2.3. Transfer students
3. Faculty who teach or have offices in the Innovation Center.
4. University of South Carolina.
5. Engaged third parties with some interest in other stakeholder groups (e.g. friends or family).

Personas on the following pages.



# Audrey Computé

## Motivation

Audrey wants to sharpen her theoretical CS skills to apply for an Applied Statistics and Data Science MS at the University of Southern California.

## Skills

Public Speaking: 3/5  
CS Aptitude: 5/5  
Technical Competency: 5/5

## Biography

A native of IL, Audrey graduated summa cum laude in Computer Science and Statistics from the University of Illinois Urbana-Champaign. She thought moving to California would help her achieve her dreams, but now she doesn't have time to do anything fun.



Age: 27    Divorced

Location: Murrieta, CA

Escape Room Exp.    ▲ △ △ △ △

Puzzling Level    ▲ ▲ ▲ ▲ △

Tech. Competence    ▲ ▲ ▲ ▲ ▲

## About

Audrey puts the grind first. If something can be done better, she'll put in the time to make it perfect, much to the dismay of people who want her to take it easy on herself.

## Concerns

The little free time Audrey has is spent doing things she finds fun, like puzzles, and she doesn't want her last remaining bit of leisure to be encroached upon by her application preparation.



## Jay Escapesalot

### Motivation

Jay is chomping at the bit to find the next new and challenging escape room to play. He's played every one on the internet, and can't wait for something new.

### Skills

Public Speaking: 1/5  
CS Aptitude: 2/5  
Technical Competency: 1/5

### Biography

Jay lives alone and attends USC, where he intends to take some computer classes if he can work up the courage. He's seen the Innovation Center, but has yet to enter.



Age: 22    Single

Location: Columbia, SC

**Escape Room Exp.** ▲▲▲▲▲

**Puzzling Level** ▲▲▲△△

**Tech. Competence** ▲△△△△

### About

Jay's mother introduced him to escape rooms, and he loved them so much that he decided to change his last name to reflect his newfound interest.

### Concerns

If Jay has time to think about things other than escape rooms, he feels slightly depressive, so he wants an escape room that engages him for as long as possible. He also isn't very good at computer science, so he's concerned that a CS escape room will fall outside his ability.





## Maria Geronto

### Motivation

Maria knows some people at her church who work in Computer Science, and she thinks if she can prove that she has relevant knowledge they can put a word in for her. She also loves puzzles and does a great many in her free time.

### Skills

Public Speaking: 5/5  
CS Aptitude: 0/5  
Technical Competency: 0/5

### Biography

Maria has lived with her husband Gerry for 46 years too long, and she's ready to be financially independent. Even though Gerry is a nice guy, Maria married too young to see the world.



Age: 64    Married

Location: Kent, WA

Escape Room Exp.    △△△△△

Puzzling Level        ▲▲▲△△

Tech. Competence    △△△△△

### About

Maria was there in the 1800s before computers, and she's ready to make them work for her. Her late sister worked for IBM, but she never took advantage of her connection.

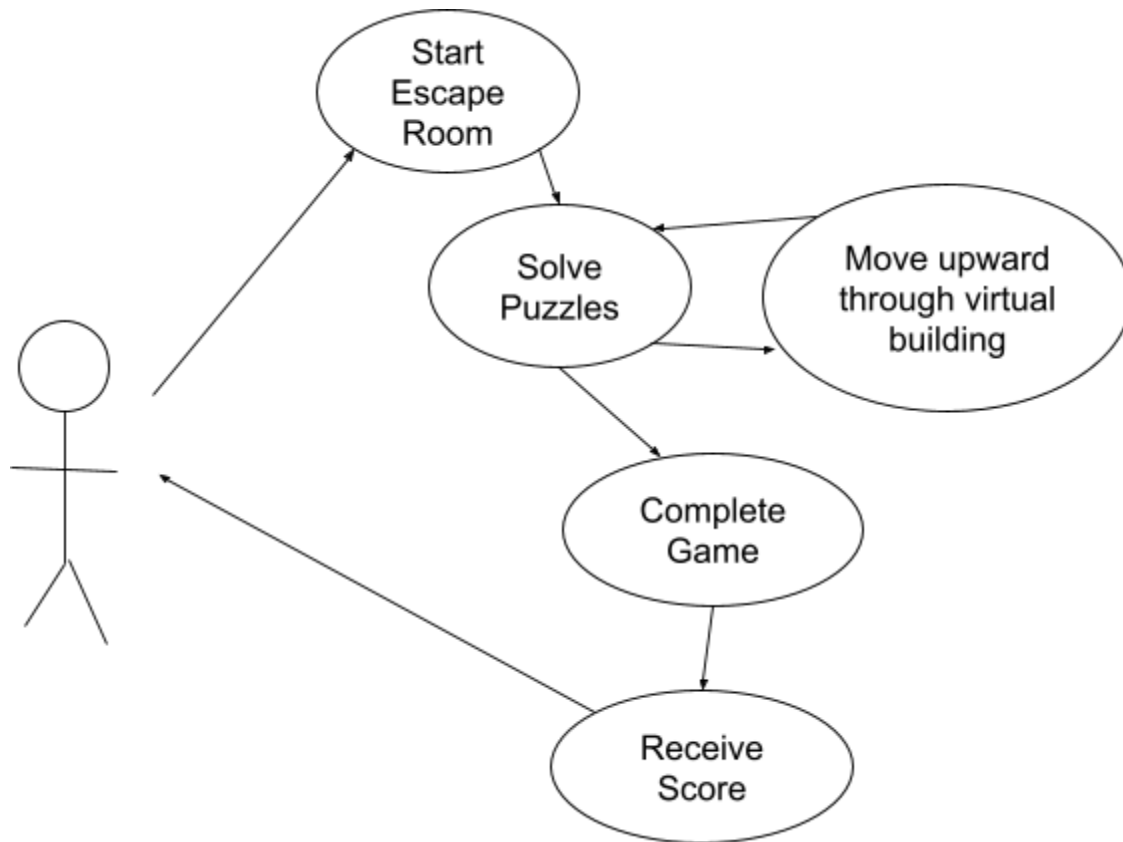
### Concerns

Maria doesn't want Gerry to know that she's studying CS to leave him because she doesn't want to hurt his feelings before she needs to.

### 3. Constraints

This project is being built for a college course and must be completed over the course of one semester. All four contributors are unpaid and have a full course load as well as other time commitments. The project has no budget and must be written in the Java programming language.

### 4. Business Use Cases





## 5. Functional Requirements

[Link to Spreadsheet](#)

## 6. Non-Functional Requirements

### Legal Requirements

The software shall comply with all applicable law.

### Performance Requirements

The software shall run quickly and without significant pause.

### Visual Requirements

The software shall appear as though some care has been taken to assure visual quality.

### Usability Requirements

The software shall support any user generally able to use a computer.

## 7. Competitive Analyses

	<b>Hood Museum of Art: Escape the Outdoors</b>
Strengths	<p>Dynamic experience; allows for online and in-person play (i.e. You can follow the map included in each challenge to the original work of art on the actual Dartmouth campus). Users can also play in teams via Zoom.</p> <p>Provides clear and concise instructions at the start before the user can play. Details how to play, what to do if you “fail,” and writes the average time it will take to complete the game. It also includes a variety of system support (phone, tablet, and computer).</p> <p>Difficulty is relatively easy. If the user is stuck on a challenge/question, the game has 3 hints, which are very helpful, plus the solution.</p>
Weaknesses	<p>Lack of attractive visuals and designs; The background is just white with black text and some images in the foreground.</p>

	The theme being “Museum and art-based” is not very enjoyable for the general audience. In addition, unless the user is a community member of Dartmouth College, the story, though relays non-fictional information, is pretty non-exciting and uninteresting.
Audience/Focus	Given some features (in-person play and the story) necessitates a specific audience, it is obvious that this game is intended for Dartmouth College students, staff, workers, and overall its community members.

	<b>Escape UCSB Library: A Virtual Escape Room</b>
Strengths	<p>Provides quick instructions to tell the user certain things they can’t do, and help them understand how to play the game.</p> <p>Users are given 60 minutes to finish the Escape Room, which, as a bonus, promotes competition among players.</p> <p>The one great strength is its interactive interfaces; It contains unique interactive animations, puzzle layouts, webpages within webpages, etc.</p>
Weaknesses	<p>Limiting and restrictive to one system; The user is basically locked to only playing on a computer given that some puzzles simply won’t render (phones or tablets are unusable).</p> <p>Horrible user experience; The game is literally unplayable for certain browsers. So, not only is the user forced to play on a computer, but the user has to first find which browsers are suitable for the game and only use those. Moreover, the puzzles take forever to load which leads to an unresponsive webpage at times (i.e the webpage just freezes).</p> <p>Difficulty is way too easy. This defeats the whole purpose of the time limit because if the game is just multiple choice and there is no way to “lose” or get “restarted,” what’s the point of player-to-player competition? Therefore, the user can guess his/her way to victory.</p>
Audience/Focus	Its primary focus is on UCSB students who mainly use the UCSB online library. It can also be said that the audience is the general library goers/enjoyers as well.

	<b>Going Buggy Escape Room: Bug and Computer Science</b>
Strengths	<p>The interface is easy to comprehend and can be used readily. There is added functionality in case of hearing impairment on the website.</p> <p>The clear, set time limit imposes a challenge and a way to track and compare scores (time).</p> <p>The puzzles can be entertaining and the escape room succeeds in its aim to inform. It brings together some relatively unknown facts and also manages to teach computer science concepts along the way.</p>
Weaknesses	<p>The premise of the escape room isn't entirely in line with what it advertises. In reality it is 'correcting' a series of bugs in the computers with bug facts until the systems are again workable. Expectation clashes with reality.</p> <p>The UI looks alright, but it is effectively a screen with an image(s) and a code reader at the bottom of the screen to input the answer to the current screen. There is no user agency in being able to explore different options or use any other alternative to solve the current problem.</p> <p>Although the difficulty can vary, the challenges are not always based on actual mental or logical leaps and can often be simply finding a code or comparing information from a table to solve the clue.</p>
Audience/Focus	Its primary focus is on students or other interested parties interested in a unique learning experience about bugs and computer science.

## Summary:

Escape Rooms	Strengths	Weaknesses	Audience/Focus
<b>Hood Museum of Art: Escape the Outdoors</b>	++ Immersive ++ System support (i.e. it runs well on all devices) ++ Fairly simple	▲ Poor visuals ▲ Boring theme/story	Dartmouth College members.
<b>Escape UCSB</b>	++ Advises	▲ Horrible user	UCSB students

<b>Library: A Virtual Escape Room</b>	player-to-player competition ++ Interactive graphics	experience ▲ Restricts the user to one system/some browsers ▲ Extra novice level difficulty	who use the college's online library
<b>Going Buggy Escape Room: Bugs and Computer Science</b>	++ Insect and computer learning through thematic puzzles ++ Decent appearance ++ Stimulating puzzles	▲ Clunky interface ▲ One user, non-replayable puzzle ▲ No user agency ▲ Often requires zooming in images and squinting to find puzzle materials	Students/people interested in bugs and computers (to a lesser extent)

The above analysis organizes data on three key competitors and actors in the educational escape room space. It laid out the features and key details a project must include and the quality-reducing characteristics a project must address. The analysis sets the course in developing Virtuoso's own product, pertaining to its intended audience.

We recognize that our product necessitates an exciting theme and engaging feel supported by a visually appealing appearance and stimulating challenges. Going Buggy Escape Room had the perfect mix of this, accompanying the game with 8-bit music that fits the theme of Computer Science. Other competitors like Escape UCSB Library added layers to how the escape room could be organized. We were able to identify important elements adding to user interaction: music settings, screen resizing and zooming for puzzles.

The lack of an exploratory user interface, which would mimic the feel of a real escape room, was definitely witnessed. Clunky puzzles and non-thematic connection were other details that we noticed were definitely limiting the appeal of the escape rooms to their intended audiences. We also noticed a lack of agency. Users want to feel like their actions matter, so being railroaded only leads to boredom. We noticed how these features were absent across several escape room variants, suggesting that there is significant room for improvement by reducing these weaknesses.

Overall, our competitive analysis uncovered two key points. One, that there is a wide gap in the educational escape room space for an accessible, informative, and fundamentally enjoyable user experience. Our product will fill this hole and address a market that has so far been left dissatisfied. Second, our research on actors in the space helped us comprehend the strengths and limitations of our competition.

Based on the competitive analysis, we achieved a new understanding that not only gives us a direction to move in but a specific roadmap of features and tools to

address along the way, preparing Virtuoso to embark on the development of Escape the Innovation Center.

## 8. References

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