

Building Digital Tools Assisting Escape Room Owners

Survey and Analysis Stage, COM3610

Simon Fish | Supervisor: Andrew Stratton

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Signed Declaration

All sentences or passages quoted in this report from other people's work have been specifically acknowledged by clear cross-referencing to author, work and page(s). Any illustrations that are not the work of the author of this report have been used with the explicit permission of the originator and are specifically acknowledged. I understand that failure to do this amounts to plagiarism and will be considered grounds for failure in this project and the degree examination as a whole.

Simon Fish

Abstract

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Chapter 1

Introduction

Escape rooms are physical, interactive experiences in which a group of participants must solve puzzles to escape a locked room, solve a mystery, or otherwise meet some goal in a particular timespan. They are a phenomenon that has existed since around 2007 (Nicholson (2015)), and are a growing industry. Escape rooms are run both by enthusiasts as solo ventures, and as franchises across the country.

The aim of this project is to build tested tools to meet the needs of escape room owners. Research will be focused towards exploring the needs of escape room owners, such that a product can be designed and built to target one or several of these. These needs may be related to issues such as making sure a timer is visible to the group, or to processes that currently take more time than necessary, such as posting photos of teams to social media (Woff (2019)).

Research Questions

I have identified two research questions, which this stage of the project will be focused towards answering:

RQ1: How are concepts used in escape rooms applied in different environments?

RQ2: Based on this, what can we establish as the requirements for escape games, independent of their environment?

Chapter 2

Literature Survey

Escape rooms have grown popular in many locations across the world as a recreational activity (Nicholson (2015), Stasiak (2016)), even serving as a tourist attraction (Dilek and Kulakoglu Dilek (2018)). Nicholson reports that the *Real Escape Game* by SCRAP was the earliest well-documented activity branded as such. SCRAP has gone on to develop escape rooms at a much larger scale than the typical escape room, which serves teams of an average size of 4.58 people (Nicholson (2015)).

Escape rooms' relative infamy means that they have not become a widespread research target, though **their use in education** is becoming an area in which research is growing. Gamification brings a variety of benefits to the field of education (Kiesler et al. (2011)), which are capitalised upon by those implementing escape rooms in education. There are various tested means of implementing escape rooms in the classroom, from Breakout EDU ("Breakout Edu," n.d.) to recruiting an agency for this purpose (Zhang et al. (2018)), to implementing one using resources already available in the classroom. This brings some benefits not available to commercial escape rooms, which employ physical puzzles that require a reset (Woff (2019)). In particular, a study by López (n.d.) organised its puzzles in a manner whereby ordering is not necessary, allowing multiple groups to attend the room at once without the need for puzzles to be reset between attempts by separate groups. This can have commercial application, and could be considered by those exploring portable escape rooms as an outlet, such as Tuzak, an Istanbul company developing escape games (Gündüz (2018)).

The increasing application of IT in education means that computers are often part of the school environment. Application of technology in escape rooms comes with some uncertainty, and a break in the flow of the escape room experience can shatter participants' immersion and lead to bad reviews (Woff (2019)). This also creates some difficulty when it comes to visibility - unless monitors are suitably placed and large enough to be viewed by a full party, the whole team may not be able to interface with a puzzle that applies technology.

Rouse (2017) applied technology to an escape room in the classroom using a game loaded from a memory stick. This application seems understandable, as Rouse's audience was likely to have some basic level of expertise in and enthusiasm for handling computers as part of the digital native generation. However, in practice, it brings to mind the image of a small group of people crowding around a screen. Woff (2019) warns against situations like this, saying that visibility of the puzzle to the entire team should be a priority. @duplessie also outlines a shortcoming of this approach in recommending movement away from what he calls the "glowing rectangles". These disadvantages of the applications of the escape room tech guide many owners not to use it much, if at all.

However, escape rooms and technology are inherently linked - digital escape-the-room games such as *Myst* precede and inspire physical escape rooms (Nicholson (2015)). These forms of escape room lack a shortcoming that is one of physical escape room owners' biggest bugbears - resetting these rooms is as simple as resetting the game. Whether this is done by restarting an attempt, restarting the game, or removing save files and starting over, it is often trivial compared to how long it takes to reset escape rooms. Woff (2019) suggests that resetting rooms can often take as long as 15 minutes, and that it is something escape room owners seek to optimise. The shorter a reset takes, the more time is available to welcome customers.

Woff (2019) theorises that VR escape rooms such as Exit Berlin may be the next stage for the industry, which would allow immersive rooms to be created while effectively eliminating the issue of resetting the room as above. This would bring the escape room cycle full circle, reincarnating the modern wave of physical escape rooms in the digital form that inspired them.

In the meantime, escape room owners are able to apply technology to varying degrees, implementing leaderboards, sharing team photos to social media, and interacting with the team via a screen in the room. One application I have personally witnessed was for a hidden camera to take a photo of the team, apply filters, and display the photo among works of art in The Gallery.

Keywords

I identified the following keywords for use in my search. The search was conducted using the Google Scholar search engine.

- escape room / puzzle hunt
- owner / host
- implementation
- software
- education / classroom

This led to the following searches.

- escape room owner
- escape room host
- escape room software
- escape room education
- escape room classroom

Chapter 3

Requirements and Analysis

The objective of my project is to build a tool for the escape room community. This may come in the form of hardware, software, or some combination of the two. I will survey the escape room community on Facebook to determine what to do here - I have a selection of ideas, which I was able to discuss with an escape room owner (Woff (2019)).

This has evolved from the initial proposal, which was to build an escape room exclusively using technology. After much discussion with my supervisor, we determined that this was too vast of a goal for the project. This would have been a distributed system using a variety of networked technology. The next phase of this idea was to create a framework for digital puzzles, which would use a variety of inputs and outputs - using the Quando framework developed by Stratton (2016), I would quickly be able to construct interactions across many media. Quando has support for the Leap Motion (“Leap Motion,” n.d.) hand-tracking device, micro:bit (“Micro:Bit Educational Foundation,” n.d.), and a variety of in-browser technology. However, the project may use a closed-source license in future (Stratton (2019)), which meant that I found it difficult to rely on for my work. Additionally, Woff (2019) warns that digital uptake in escape rooms may be middling due to the inherent risk, as discussed in the literature survey.

Chapter 4

Progress

I have been able to make good progress in defining my scope this semester. The most important thing I have had to do is to get in contact with the escape room community - I have been able to reach out to all of Sheffield's escape rooms, though only one has returned any interest in supporting the project. This was The Lockup Escape Rooms in Sheffield.

I got in contact early in November, which was a busy time for all rooms. In initial communications with The Lockup, Liam offered a free attempt at the escape room pro bono. I took up this offer on the 29th November with a group of friends. The experience was enjoyable for all, and I found it refreshing to see some science applied within the room - one of the puzzles relied on mixing chemicals and using the colours of the resultant reactions to solve the next puzzle.

Before this, I met with Liam on the 20th November to discuss the challenges he faces as an escape room owner, and his philosophy in developing the rooms he offers at The Lockup. Engagement, visibility and breakability all inspire his approach: the entire party must be able to interact with, and be engaged by, puzzles in the room, and the puzzles should not take long to reset to their initial state for the next party that attends the escape room (Woff (2019)). Liam and I discussed some areas that could be targeted, which will inspire a survey I send to the Facebook group created by Nicholson (2015).

Nicholson runs a Facebook group¹ for escape room enthusiasts, encompassing both owners and participants, to which I sought and gained access as part of my work. The majority of posts, at the time of writing, seem to be from enthusiasts who report back from rooms they have attended, though I have seen posts about types of puzzles that can be implemented. I intend to survey this group, as it appears to be a central hub for what may be a sparse online community.

Though I have not yet locked in my approach, I have been learning to develop for the ESP32 microcontroller and the unPhone platform (Cunningham (2019)). This provides a strong framework for IoT development at a low cost and may be an outlet to explore in the development of my artifact.

¹<https://www.facebook.com/groups/608883549212939/>

Chapter 5

Conclusions and Project Plan

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