

# Building Digital Tools Assisting Escape Room Owners

Survey and Analysis Stage, COM3610

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This report is submitted in partial fulfilment of the requirement for the degree of Computer Science with a Year in Industry by Simon Fish.

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**Signed Declaration**

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Simon Fish

## Abstract

# Contents

	Signed Declaration . . . . .	i
	Abstract . . . . .	ii
<b>1</b>	<b>Introduction</b>	<b>1</b>
	Research Questions . . . . .	1
<b>2</b>	<b>Literature Survey</b>	<b>3</b>
	Keywords . . . . .	3
<b>3</b>	<b>Requirements and Analysis</b>	<b>5</b>
<b>4</b>	<b>Progress</b>	<b>7</b>
<b>5</b>	<b>Conclusions and Project Plan</b>	<b>9</b>



# 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<sup>1</sup> 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. However, that is not to say that there is no place for it in puzzles - Rouse (2017) was able to apply this using a game loaded from a memory stick.

## 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

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<sup>1</sup><https://www.breakoutedu.com/>

- 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 , I would quickly be able to construct interactions across many media. Quando has support for the Leap Motion hand-tracking device, BBC MicroBit , and a variety of in-browser technology. However, the project may use a closed-source license in future , 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 group<sup>1</sup> 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. 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.

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



## Chapter 5

# Conclusions and Project Plan

Dilek, Sebahattin Emre, and Nur Kulakoglu Dilek. 2018. “Real-Life Escape Rooms as a New Recreational Attraction: The Case of Turkey.” *Anatolia* 29 (4): 495–506.

Gündüz, Şafak. 2018. “Preventing Blue Ocean from Turning into Red Ocean: A Case Study of a Room Escape Game.” *Journal of Human Sciences* 15 (1): 1–7.

Kiesler, Sara, Robert E Kraut, Kenneth R Koedinger, Vincent Aleven, and Bruce M McLaren. 2011. “Gamification in Education: What, How, Why Bother?” *Academic Exchange Quarterly* 15 (2): 1–5.

López, Ángela Gómez. n.d. “The Use of Escape Rooms to Teach and Learn English at University.” *RESEARCH, TECHNOLOGY AND BEST PRACTICES IN EDUCATION*, 94.

Nicholson, Scott. 2015. “Peeking Behind the Locked Door: A Survey of Escape Room Facilities.” *White Paper Available Online at [Http://Scottnicholson.com/Pubs/Erfacwhite.pdf](http://Scottnicholson.com/Pubs/Erfacwhite.pdf)*.

Rouse, Wendy. 2017. “Lessons Learned While Escaping from a Zombie: Designing a Breakout Edu Game.” *The History Teacher* 50 (4).

Stasiak, Andrzej. 2016. “Escape Rooms: A New Offer in the Recreation Sector in Poland.” *Turyzm* 26 (1): 31–47.

Woff, Liam. 2019, November.

Zhang, Xiao Chi, Hyunjoo Lee, Carlos Rodriguez, Joshua Rudner, Teresa M Chan, and Dimitrios Papanagnou. 2018. “Trapped as a Group, Escape as a Team: Applying Gamification to Incorporate Team-Building Skills Through an ‘Escape Room’experience.” *Cureus* 10 (3).