

Design Concept

'Skandal in Wien - Ed. 1: Der Sacher-Diebstahl' Escape Game

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A. Terminology

For identifying the most important aspects for our Escape Game (EG) we consider the *player loop (image on the right)* and some common terminology (*gate, clue, signifier*) in the area of escape rooms.¹ Additionally, we use the definition from Krekhov et al (2018) for distinguishing the terms *challenge* and *puzzle*.²

This is a short recap of our findings from literature to better understand the tables in section D, which describe the game's puzzles in more detail. We tried to outline the player loop for each puzzle, but the given order of steps in the loop is not applicable to every puzzle. We therefore chose to use minor variations for the order of tasks to make sense to the player.

-  Identify Gates
-  Collect Clues
-  Select Gate to Work On
-  Solve Puzzle (Aha)
-  Complete Puzzle (Process)
-  Input Answer
-  Repeat Loop

gate	<p><i>A surmountable obstacle that prevents the team from progressing in the game. This can be a door, a lock, a puzzle, a dexterity challenge, an actor, the expanse of time, ignorance, anything that bars access. When implemented in a game, designers refer to this mechanic as gating.</i></p>
clue	<p><i>An in-game item and/or piece of information required to surpass a gate. Examples include a key, passcode, part of a solution to a puzzle. This is defined here to differentiate from a hint: out-of-game information designed to help the player advance, but not required to complete the game.</i></p>
signifier/ signposting	<p><i>Obvious or subconscious clues within the game directing the players on what to do next. For example, if a puzzle is solved, a light can come up indicating the next gate to be solved. The video game industry refers to this as signposting, but this tends to give the wrong idea that players need to be handheld throughout the game.</i></p>
challenge	<p><i>A task to be done in order to solve a riddle in the game. It can be one of several options mentioned by Krekhov et al (2018) (see also section (d) of this chapter), with the broad categories being 'Mental', 'Physical' and 'Emotional'.</i></p>
puzzle	<p><i>A set of challenges to be completed in order to surmount a gate.</i></p>

¹ <https://thecodex.ca/how-escape-rooms-do-difficulty-wrong-the-player-loop/>, last accessed: 27/03/23.

² Andrey Krekhov, Katharina Emmerich, Ronja Rotthaler, and Jens Krueger. 2021. Puzzles Unpuzzled: Towards a Unified Taxonomy for Analog and Digital Escape Room Games. Proc. ACM Hum.-Comput. Interact. 5, CHI PLAY, Article 269 (September 2021), 24 pages. <https://doi.org/10.1145/3474696>

B. Theme - Background Story

The Story: The famous recipe of the Sachertorte was stolen from Hotel Sacher. The thief threatens to reveal the recipe to the public and thus destroy the uniqueness of the Sachertorte if he doesn't get paid 1 million Euro by the end of the day. Of course, the director of Hotel Sacher does not want to spend this much money, so he decides to send out a press release in order to get help from Vienna's citizens for catching the thief in time. As a reward, the director offers a private celebration over coffee and Sachertorte at the Hotel.

The team hears about the incident and decides to participate in the search last-minute, which leaves them 40 Minutes until the thief's 'end of the day-deadline'.

C. Introduction Process

The players, who have previously signed up for a timeslot to play the game, will go through a short introduction process when they arrive at the game location. The introduction will be done in a 'General Room', where the players cannot see any of the game props. We plan to include the following steps:

- Welcome the participants
- Administrative work: this is a study, so we need their
 - informed consent
 - signed data protection
 - plus: we ask for a quick self-assessment on a tech-affinity scale
- Game-related: what the instructors will tell the players:
 - The players are asked to play an escape game. It contains technological artifacts that must not be treated violently. However, apart from violence it is allowed to try everything out that comes to the participant's minds.
 - It is allowed, more even recommended, to talk to the other players and exchange thoughts and ideas.
 - The instructors normally will not interfere in the game, unless the players feel stuck and have questions. Hints for each puzzle will be granted, the level of detail for the hint depends on the players' problem.
 - There will be a timer in the game that tells how much time the team has left to complete the game.
 - All necessary info for the story of the game & clues for puzzles can be found within the game.
 - The puzzles will be sequential, so if the players are located at one table, then only the resources on this table will be needed to solve the puzzle. There is a logical reasoning that leads to the correct next module.
- Clarify any open questions

D. Game Process

Once the organizational part of the study is completed and players know the rules of the game, they enter the 'Game Room', where the storyline begins. The following tables explain each puzzle in detail in chronological order.

PUZZLE 0 (INTRO)

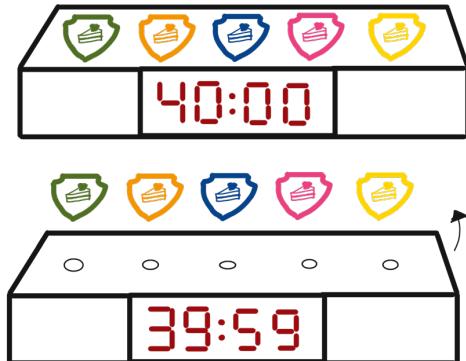
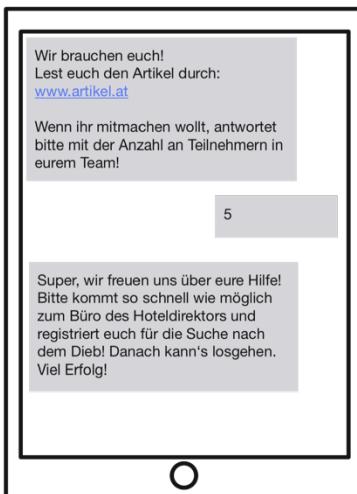
Level: easy

Challenge type: physical: object alignment, connection

Focus: Storyline & acclimatization to game room and first technology-task

Location	Game Room
Situation	<p>The team enters the game world. They stand in the Game Room, where the EG takes place. A message alert (<i>signifier</i>) directs the team to a tablet. They read a message that contains a link to a newspaper article with a video of an interview with the hotel director.</p> <p>The article explains the robbery & that the search teams should follow the thief's path step by step by collecting clues at each "stop" and figuring out his next move. It also says that the thief will reveal the recipe to the public by the end of the day if he is not caught or paid before the set deadline. The team has to register for the search at the hotel director's office in order to get their official badges for their mission. With these badges, the hotel director wants to check the progress of the team and later be able to reconstruct the thief's path.</p> <p>The players decide to form a team and join the search for the missing recipe.</p>
Goal	Find out where in the EG room the director's office is located & register the team in order to start the countdown
Gate	The surface with attached countdown-display where the badges have to be placed onto.
Solution	Each player is supposed to register for the search at the hotel director's office. He then gets two detective's badges, one to be placed on the registration surface (3D printed object with magnet on the bottom) and the other to be worn as an official identification badge (on a chain around the neck). The badges have to be placed onto a surface with reed switches. If all team members position their badges, the circuit will be closed and the countdown of 40 minutes will start. (If a team with a smaller number of players plays the EG, the remaining positions could be filled with placeholder objects that don't resemble badges, but simple geometric objects or technological devices.)
Clues/ Materials	<ul style="list-style-type: none"> - tablet with messages & link - online article & video - 3D badges with magnets + 3D badges on necklaces - surface with reed switches & attached display (countdown)
Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates</i>: different tables in the EG room 2. <i>Collect Clues</i>: signifier (message) directs them to the tablet, where they receive a link & instructions where and how to register for the game; identify badges and surface 3. <i>Select gate</i>: the surface with attached display at director's office 4. <i>Solve Puzzle (Aha)</i>: know what to do with the badges 5. <i>Complete Puzzle (Process)</i>: select a badge each and place it onto the surface 6. <i>Input Answer</i>: once all badges are placed, the countdown starts

Sketches



PUZZLE 1

Level: medium/difficult

Challenge type: mental: observation/searching, knowledge
physical: connection

Focus: Basic Hardware (Laptop / Tablet, Speakers, USB Stick, Bluetooth)

Location	Hotel Sacher - director's office
Situation	The team has registered at the office. They are now at the crime scene, where the recipe was stolen from the safebox.
Goal	Find out the thief's (next) location by investigation of the crime scene
Gate	Next module of the game, resembling the Leopold Museum with 'Libelle' platform on top.
Solution	The players find an USB stick with the surveillance video, connect it via adapter to the ipad and play the video. They recognise that the audio is not working/not loud enough, so they connect the device via bluetooth to a speaker. They hear the thief talking to an accomplice, mentioning a nickname for a meeting location. If they are not familiar with the term, they google it and then look for the corresponding module on the other tables.
Clues = Objects/ Materials	tablet usb stick + adapter surveillance video mentioning: - meeting nickname (Leopold Libelle) - characteristic item of clothing to recognise accomplice - name of the competitor bakery bluetooth speakers

	<p>from intro (kept messages on the tablet): newspaper article video from police spokesman/hotel director</p>
Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates:</i> remaining tables & modules in the EG room 2. <i>Collect Clues:</i> ipad, adapter, USB stick with surveillance video (if no audio: hint in the video that the speaker is not connected), bluetooth speaker 3. <i>Select gate:</i> can only be done after the puzzle is solved (the module resembling the Leopold Museum + 'Libelle') 4. <i>Solve Puzzle (Aha):</i> know that the usb stick may contain something; know that audio is necessary for the video; identify that the nickname of the location needs to correspond to the module 5. <i>Complete Puzzle (Process):</i> see Solution 6. <i>Input Answer:</i> choose the correct next module



PUZZLE 2

Level: medium

Challenge type: mental: observation/searching, knowledge

physical: object alignment/connection

Focus: Social Media

Location	Meeting point of thief & accomplice: “Leopold - Libelle” (Museumsquartier Libelle viewing platform on the roof of Leopold Museum)
Situation	The team is now located at the meeting point the thief mentioned on the phone in the surveillance video. They investigate the area.
Goal	Find out about the thief's accomplice: which competitor bakery he is from (& what his birth date is for reconstruct a passcode from a clue on a post-it note - this is needed for puzzle 3)
Gate	Module of the game resembling the World's Best Bakery.
Solution	Investigate the meeting location spot & find wallet with NFC card. The card shows the Instagram logo with a page handle on it (@worlds_best_bakery). The wallet also contains a post-it note with a hint to a password (needed for puzzle 3). The team checks the mentioned Instagram page & finds picture of the accomplice (characteristic clothing item mentioned in the surveillance video): a post saying “happy birthday employee of the month + his age”
Clues/ Material	<ul style="list-style-type: none"> - wallet - card with NFC chip, written on it: Instagram Logo + @bakeryXY - post-it note with hint to password for next puzzle - mobile device with Instagram - Instagram page of the bakery
Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates:</i> remaining tables & modules in the EG room 2. <i>Collect Clues:</i> wallet with NFC card + Instagram name, post-it note; from Instagram: logo of the bakery + birth date of the employee 3. <i>Select gate:</i> to be done after checking Instagram: module resembling the bakery with the specific logo 4. <i>Solve Puzzle (Aha):</i> understand that checking Instagram is necessary 5. <i>Complete Puzzle (Process):</i> scroll through posts to find ‘happy birthday’ post 6. <i>Input Answer:</i> open the bakery module with NFC card
3D model / circuit / Sketch	
<i>Sketch - Instagram Page for “World's Best Bakery”:</i>	

Instagram

WBB Worlds_Best_Bakery Anzeige

New in! *own!*

World's Best Bakery

• Vienna •

Shop by!

Weitere Infos >

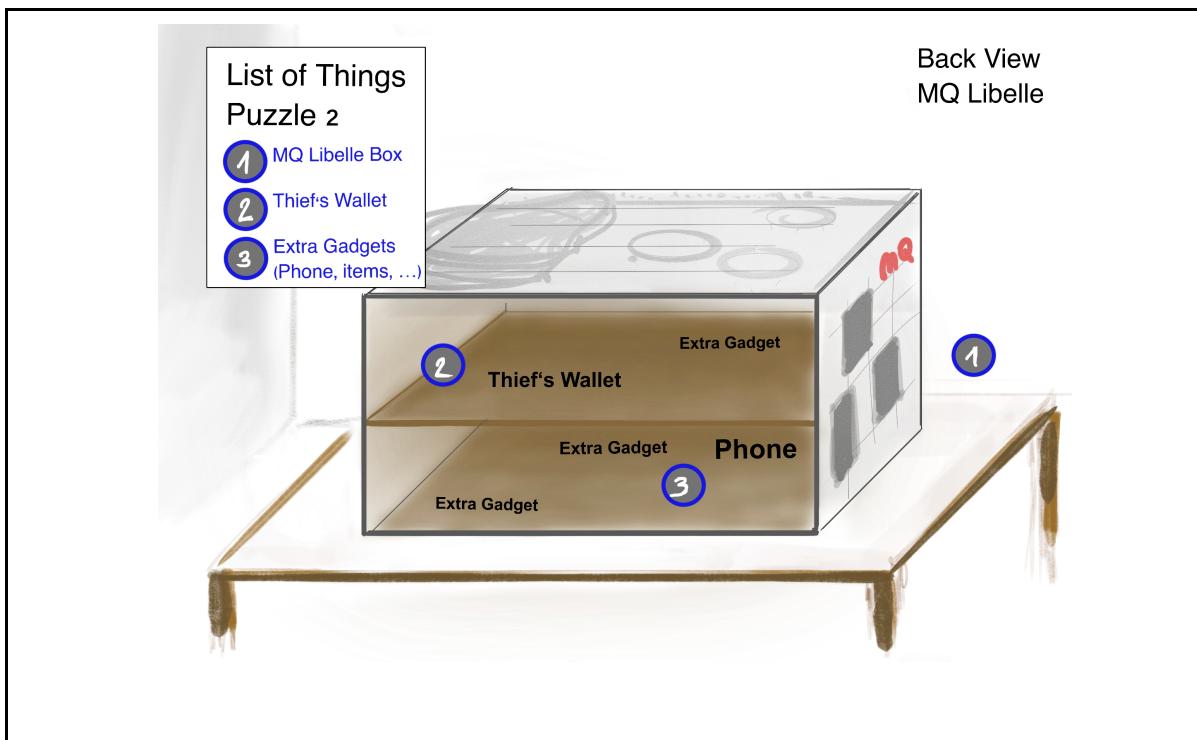
Gefällt 80 Mal

Front View MQ Libelle

MQ Libelle - Front & Back View of the Box:

List of Things
Puzzle 2 (1)

1 MQ Libelle Box



PUZZLE 3

Level: easy

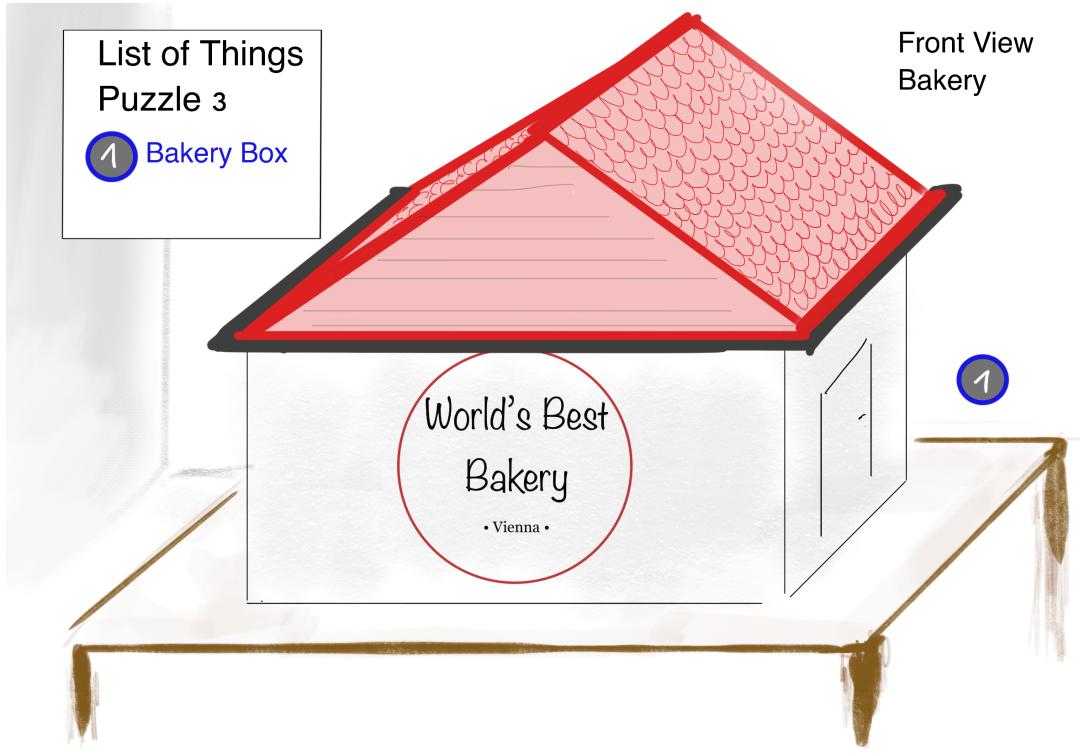
Challenge type: mental: pattern recognition
physical: combination

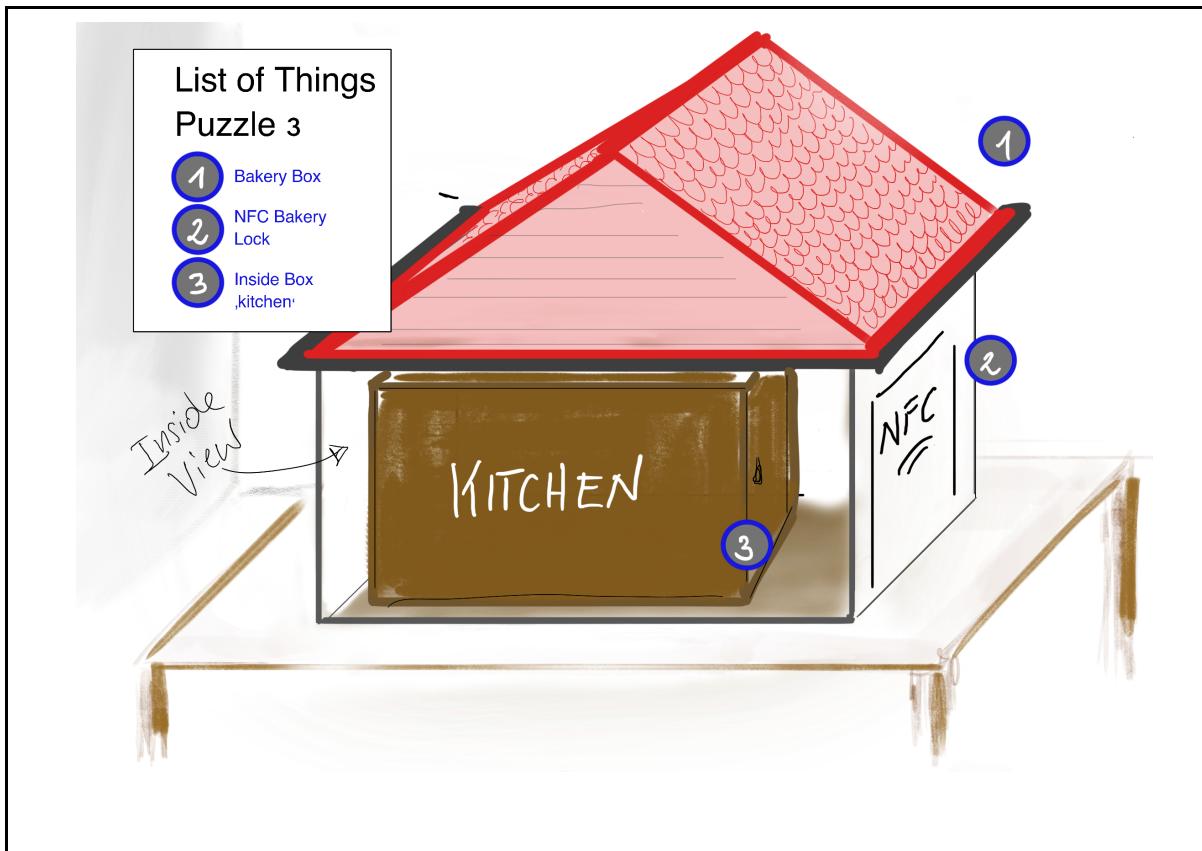
Focus: NFC & mechanical number locks

Location	Competitor bakery "World's Best Bakery"
Situation	Team arrives at the bakery & unlocks the main door with NFC chipcard
Goals	<ul style="list-style-type: none"> - Unlock the main door with NFC - Use the birth date - passcode to open one of the mechanical number locks (=the kitchen door)
Gate	number lock at kitchen door
Solution	The team recognises a symbol on the outside of the module that indicates a scan of a card. They open the module by scanning the NFC card. On the inside, there are several doors with mechanical locks (those are represented by different locks on a box inside the "bakery box"). They remember the post-it note from the previous puzzle & the birth date of the employee and use the number combination for unlocking the correct door.
Clues/ Materials	<ul style="list-style-type: none"> - lights or NFC symbol on outside of the module - inside of the module: several "doors" with number locks and the team has to figure out which door opens with the birthday-passcode.

Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates</i>: mechanical number locks inside the module 2. <i>Collect Clues</i>: passcode-pattern from post-it note, birth date of the employee 3. <i>Select gate</i>: kitchen door (selection process=trial and error) 4. <i>Solve Puzzle (Aha)</i>: understand connection between post-it note & birth date 5. <i>Complete Puzzle (Process)</i>: put birth date digits in the correct order (optionally: check instagram again if not done in the previous puzzle) 6. <i>Input Answer</i>: put digits of the lock in the correct order to open the lock
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3D model / circuit / Sketch





PUZZLE 4

Level: difficult

Challenge type: mental: deduction, light, logic
physical: object movement/alignment, disassembly

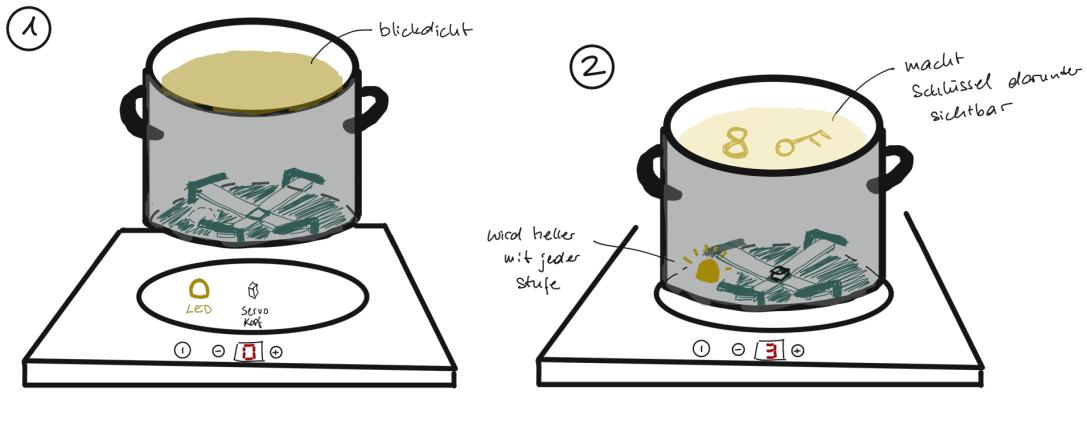
Focus: Stove / Touch interface

Location	Competitor bakery: kitchen
Situation	The team enters the kitchen and hears voices from behind a door saying that a separate key is hidden in a pot with frozen soup.
Goal	access the back office by opening the door with the correct key from the pot
Gate	back door: physical key lock
Solution	The team searches for the correct pot that they hear some voice talking about. They see that the soup in it is frozen (but the key is not visible). They put the pot onto the stove. When they turn on the stove, light from below gets brighter with each increment and the key will be visible. When they reach level 8 of the stove, a servo rotates and unlocks the „frozen soup surface“ (see idea 2 below). The pot's handle can be pulled out and the key can be taken out. (Similarly for idea 1: the pot's bottom is unlocked from the rest of the pot and through lifting the pot, the key is revealed.)

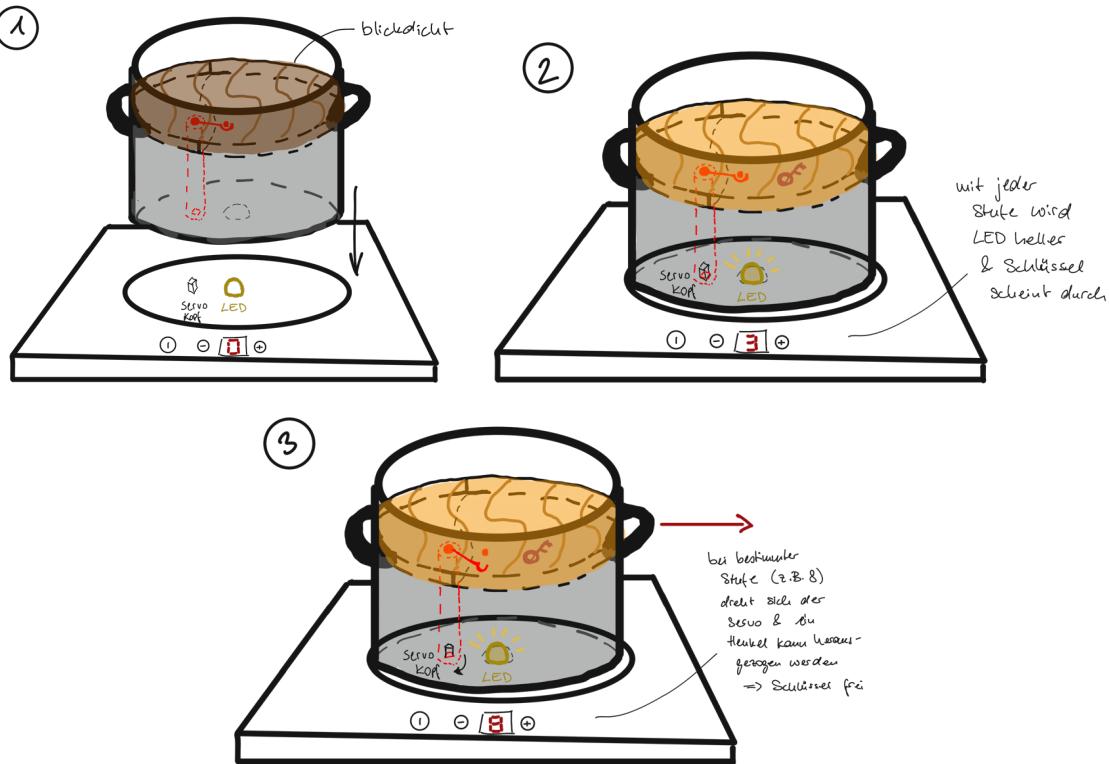
Clues/ Materials	<ul style="list-style-type: none"> - mechanical key frozen in soup (3D printed pot) - 'touch-stove', put together with var. touch-sensors / pressure sensors
Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates</i>: key lock 2. <i>Collect Clues</i>: pot (from voice), stove 3. <i>Select gate</i>: key lock 4. <i>Solve Puzzle (Aha)</i>: understand connection between pot & stove 5. <i>Complete Puzzle (Process)</i>: use the stove to 'heat' soup and reveal key 6. <i>Input Answer</i>: open the lock with the key

3D model / circuit / sketches

Idea 1:



Idea 2:
(hier zB
Stufe
8)



3D model for idea 2

<https://www.tinkercad.com/things/liVPZlka596-pot-stove/edit?sharecode=dld-68IAWWQBuPVQbgw7Ya0vYGt2j8YWS9CUtiNKXas>

circuit

<https://www.tinkercad.com/things/4wrXrjavePB>

(first try with segment display - no servo & not the correct light mechanism yet)

PUZZLE 5

Level: easy

Challenge type: mental: search, knowledge
physical: object alignment

Focus: QR Code

Location	Competitor bakery: office
Situation	The team enters the director's office in the competing bakery. The team searches the office.
Goal	find out where the recipe is hidden
Gate	collected resources for deposit box

Solution	In the office, the team finds a QR code, which has to be scanned in order to reveal the location & number of a storage lock. (Additionally, the team sees a whatsapp audio message popping up on the director's smartphone, which is from the thief. In the message, he tells the number-code for the storage box.)
Clues/ Materials	<ul style="list-style-type: none"> - QR code for storage deposit box nr & location - handwritten storage number on the sheet with the QR code - tablet/smartphone for QR scan - (smartphone) - (whatsapp-audio-message for lock combination)
Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates:</i> storage facility module 2. <i>Collect Clues:</i> QR code - location & number of deposit box 3. <i>Select gate:</i> storage facility module 4. <i>Solve Puzzle (Aha):</i> know that code has to be scanned with camera 5. <i>Complete Puzzle (Process):</i> scan the code & reveal number & location of deposit box 6. <i>Input Answer:</i> go to the last module

3D model / circuit / Sketch



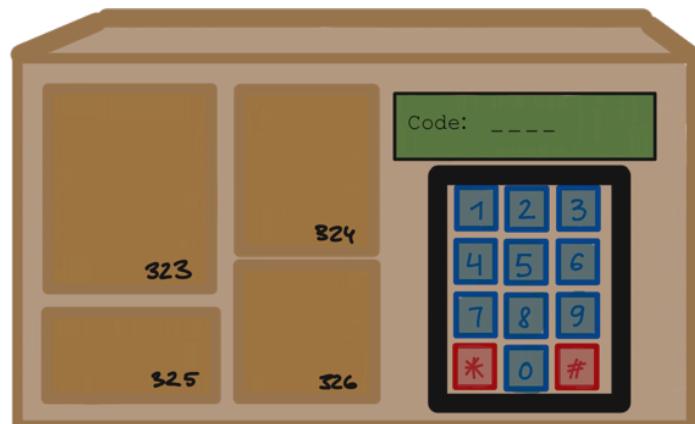
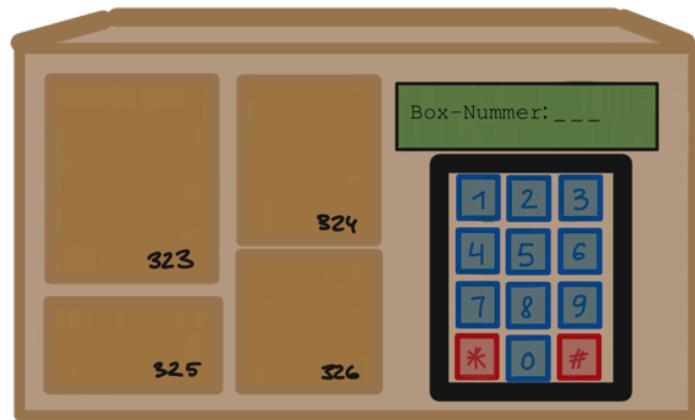
PUZZLE 6

Level: medium

Challenge type: mental: search, comparison/pattern recognition

Focus: Number Puzzle + Ending (Marketing Gag)

Location	Storage facility
Situation	The team looks for the box with the right number.
Goal	Find the recipe and bring it back to the Hotel Sacher
Gate	Digital number lock on the deposit box
Solution	The team uses the clues from the last puzzle for opening the deposit box. They find a fake recipe of the 'Sacher-Skandal', which turns out to be a marketing gag from Sacher & the other bakery. The recipe includes a note that the team should go back to the director's office and trade their badges for a tasty piece of Sachertorte as reward for participating. The team places their badges back onto the surface from the start and the countdown stops.
Clues/ Material	<ul style="list-style-type: none"> - clues from last puzzle (nr from QR code & passcode) - deposit boxes - number lock(s) - numbers on the deposit boxes;
Player loop	<ol style="list-style-type: none"> 1. <i>Identify Gates:</i> storage boxes 2. <i>Collect Clues:</i> number of the box & passcode (from last puzzle) 3. <i>Select gate:</i> correct storage box 4. <i>Solve Puzzle (Aha):</i> passcode belongs to the storage box 5. <i>Complete Puzzle (Process):</i> - 6. <i>Input Answer:</i> type in passcode
Sketches	



deposit box input



end of game:
stop the countdown by placing all badges back onto the surface

Overall View - The Puzzles:

This sketch represents the overall structure of our escape room - showing where the different “puzzle-stations” will be arranged:

