SYSTEM REQUIRMENETS

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<u>System - Escape Room: Sleuth</u>

Subsystem: Clue-meister

Part A:

A).

- - Functional
- • The Subsystem shall allow room hosts to easily keep track of the group in the room.
- • The subsystem shall require employees to create an account using their unique employee ID.
- • The subsystem shall have a list of clues it can send automatically that changes based on where the group is in the room.
- • The subsystem shall have a built-in flowchart that lets it know where the group is in the room.
- • The subsystem shall allow for clues to be drafted in case of a unique scenario.
- • The subsystem shall have a "clue bank" that contains more specific clues that the subsystem is not allowed to send automatically.
- • The subsystem shall have an internal timing system.
- • The subsystem shall have a timer that counts down from sixty minutes from default.
- • The subsystem shall allow the "start-time" to be changed.
- • The subsystem shall have integrated time-intervals that a clue can be sent at, depending on how much time the group has remaining.
- • The subsystem shall give a fifteen second time window that allows the employee to verify the correct clue is being sent before the subsystem automatically sends it.
- • The subsystem shall allow the employee to cancel an automatic clue before it is sent.
- • The subsystem shall allow the employee to send the clue before the fifteen second time window expires.
- • The subsystem shall allow employees to automatically start time.
- • The subsystem shall allow employees to automatically stop time.
- • The subsystem shall allow employees to manually start the time.
- • The subsystem shall allow employees to manually stop time.
- • The subsystem shall only use data from individual computers.
- • Groups shall be able to request a clue just by pressing a button in the room

- The subsystem shall require a small light to be installed in the host room that turns on when a group requests a clue
- The subsystem shall make a noise when the group requests a clue or when it is about to send a clue automatically.
- The subsystem shall be able to integrate with the backend systems.
- The subsystem shall require Python to be installed on each computer
- The subsystem shall allow users to remotely access it.
- The subsystem shall only be updated and maintained non-remotely.
- The subsystem shall allow for clues to be delivered quickly based on the group's performance.
- The subsystem shall allow employees to manually write and send a clue.
- The subsystem shall have a list of pre-written clues that can be automatically sent.
- The subsystem shall have a list of pre-written clues that can be manually sent.
- The subsystem shall require all computers and monitors to be placed on one wall so employees can easily keep track of multiple groups.
- The subsystem shall require a button to be created in the front-end that will start the room ambiance music.
- The subsystem shall require a button to be created in the front-end that will arm the remote start/stop system.
- Operational
- The subsystem shall not cost more than $12,000 USD in equipment and installation fees.
- The subsystem shall not cost more than $4,000 USD to develop.
- The subsystem shall not cost more than $1,000 USD annually to maintain.
- The subsystem shall allow for less employees to fully cover the location.
- The subsystem shall allow one employee to run up to three rooms at a time.
- The subsystem shall allow for walkie-talkies to be used for better communication among employees.
- The subsystem shall allow for automation to be disables or enabled at any time.

B).

- The subsystem shall have an annual uptime of ninety-nine percent. (This allows for only 86 hours (about 7 days) of downtime per year.)
- Each component of the subsystem shall automatically check for any necessary software updates daily.
- The subsystem shall automatically download and install any required software updates.
- The subsystem shall not cost more than $1,500 U.S. dollars to dispose

C).

- The subsystem shall have a mobile application that allows employees to access and use the subsystem remotely.
- The subsystem shall allow employees to sign in to the mobile app using their account.
- The subsystem shall require usernames and passwords for each employee.
- The subsystem shall allow the administrators to take away subsystem access from employees.
- The subsystem shall have a mobile application that allows employees to track reset, double check, and triple check progress.
- The subsystem shall be capable of properly functioning on Android devices running version 11.0 or later
- The subsystem shall be capable of properly functioning on iOS devices running iOS version 12.0 or later
- The subsystem shall allow administration to remotely access, maintain, and update employee information.
- The subsystem should not cost more than fifty thousand U.S. dollars to develop.
- The subsystem should not cost more than one hundred thousand U.S. dollars per year to operate.
- The subsystem shall have an annual uptime of ninety-nine percent. (This allows for only 86 hours (about 7 days) of downtime per year.)
- Each component of the subsystem shall automatically check for software updates daily.
- The subsystem shall automatically download and install any required software updates.
- The subsystem shall not cost more than $2,000 U.S. dollars to dispose.
- The subsystem shall allow employees to send clues remotely while they are away from the computer.
- The subsystem shall display a message on the main computer if the reset is not complete, then update once completed.
- The subsystem shall display a message on the main computer if the double check is not complete, then update once completed.
- The subsystem shall have a responsive mobile application that complies with the Web Content Accessibility Guidelines (WCAG).
- The subsystem shall have a mobile application that complies with the Americans with Disabilities Act (ADA).
- The subsystem should have a mobile application that can switch between light and dark mode.
- The subsystem shall have a mobile application that allows for updating the group's progress in the room.
- The subsystem shall have a mobile application that does not work if the employee is not in the building.
- The subsystem shall have a mobile application that requires access to the users location.
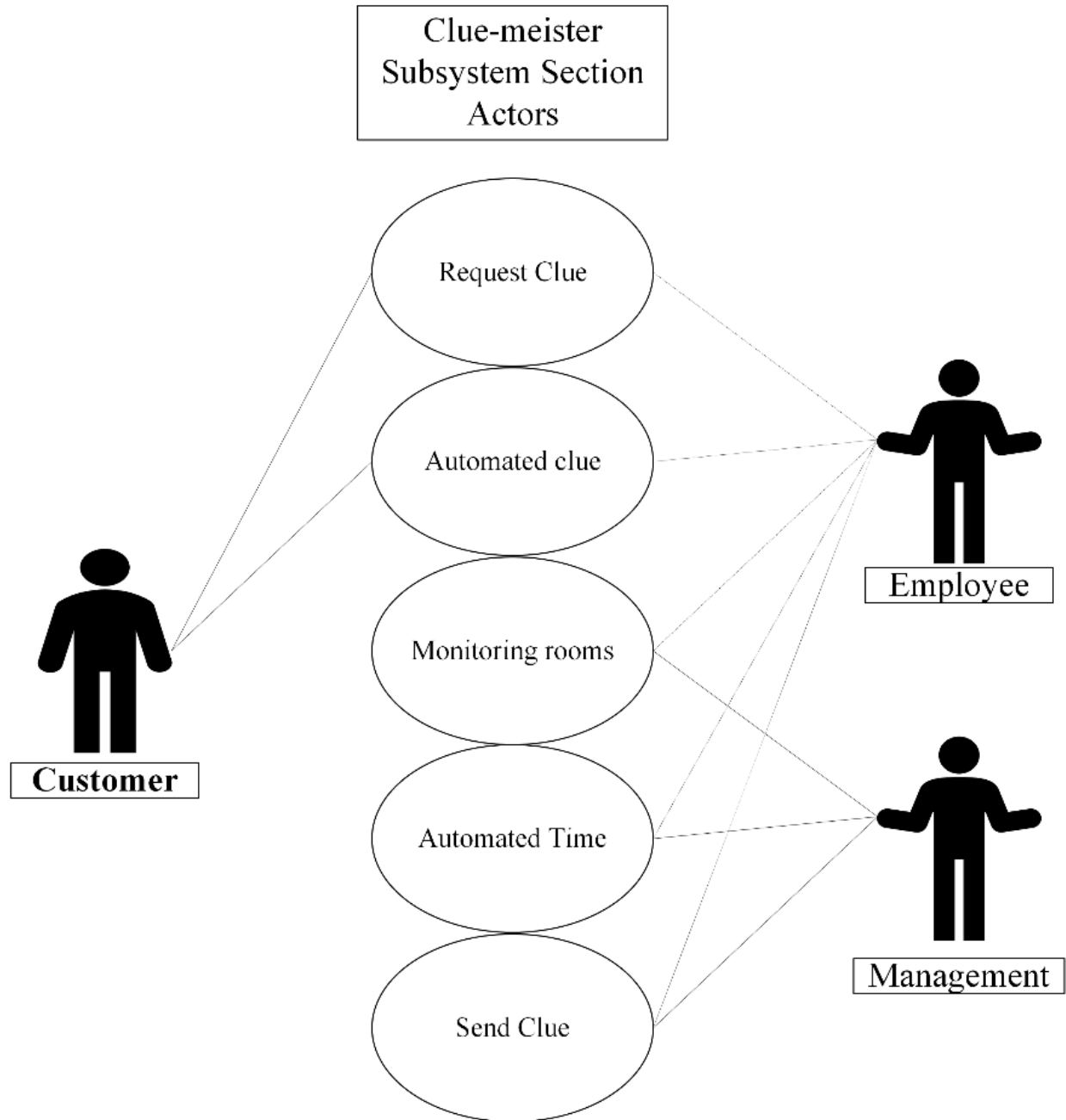
PART B:

1. Use Cases

Use Case	Brief use case description
Send clue	Employees select a clue they want to send and send it, the system marked the clue as "already sent", and greys it out in the UI.
Requests clue	Customers press the "clue-button" in the room. The system sends a message to the monitoring room computer, and the employee chooses which clue to send. Selected clue will be sent automatically after ten seconds.
Automated clue	Customers will receive a clue based on how far they have progressed in the room and how much time they have left. The system will know where the group is in the room based on the flow-chart that the employee updates.
Monitoring rooms	Employees will be able to monitor all rooms easily due to five large screens in the "host room" displaying all camera views. Camera views will be organized by room.
Automated Time	Once employees place customers in their room, employees will scan a sensor outside the door that will automatically start the time. Once customers are at the end of the room, employees will scan a sensor outside the exit door that will stop the time.

2. Actors

Use Case	Users/Actors
Send clue	Employee Management
Requests clue	Customer Employee
Automated clue	Employee Customer
Monitoring rooms	Employee Management
Automated Time	Employee Management

3. Use Case Diagram

4. Domain Model Class Diagram

ClueRequest

+boolean isButtonPressed
+boolean isAlertSounding

+processRequest()
+suggestClue()

Employee

+String employeeID
+String username
+String password

+createAccount()
+sendClue()
+confirmClue()
+cancelClue()
+startTimer()
+stopTimer()
+manageClueBank()

EscapeRoom

+String roomID
+String roomName
+boolean isAutomationEnabled

+monitorGroupProgress()
+startAmbianceeMusic()

MobileApp

+String appVersion
+boolean isAuthenticated

+sendClueRemotely()
+trackProgress()
+disableAppAccess

Timer

+int timeRemaining

+startTime()
+stopTime()
+adjustStartTime()
+sendClueAtInterval()

Group

+String groupID
+int currentPuzzle

+requestClue()

Clue

+String clueID
+String clueText
+boolean isAutomatic

+sendClue()
+draftClue()
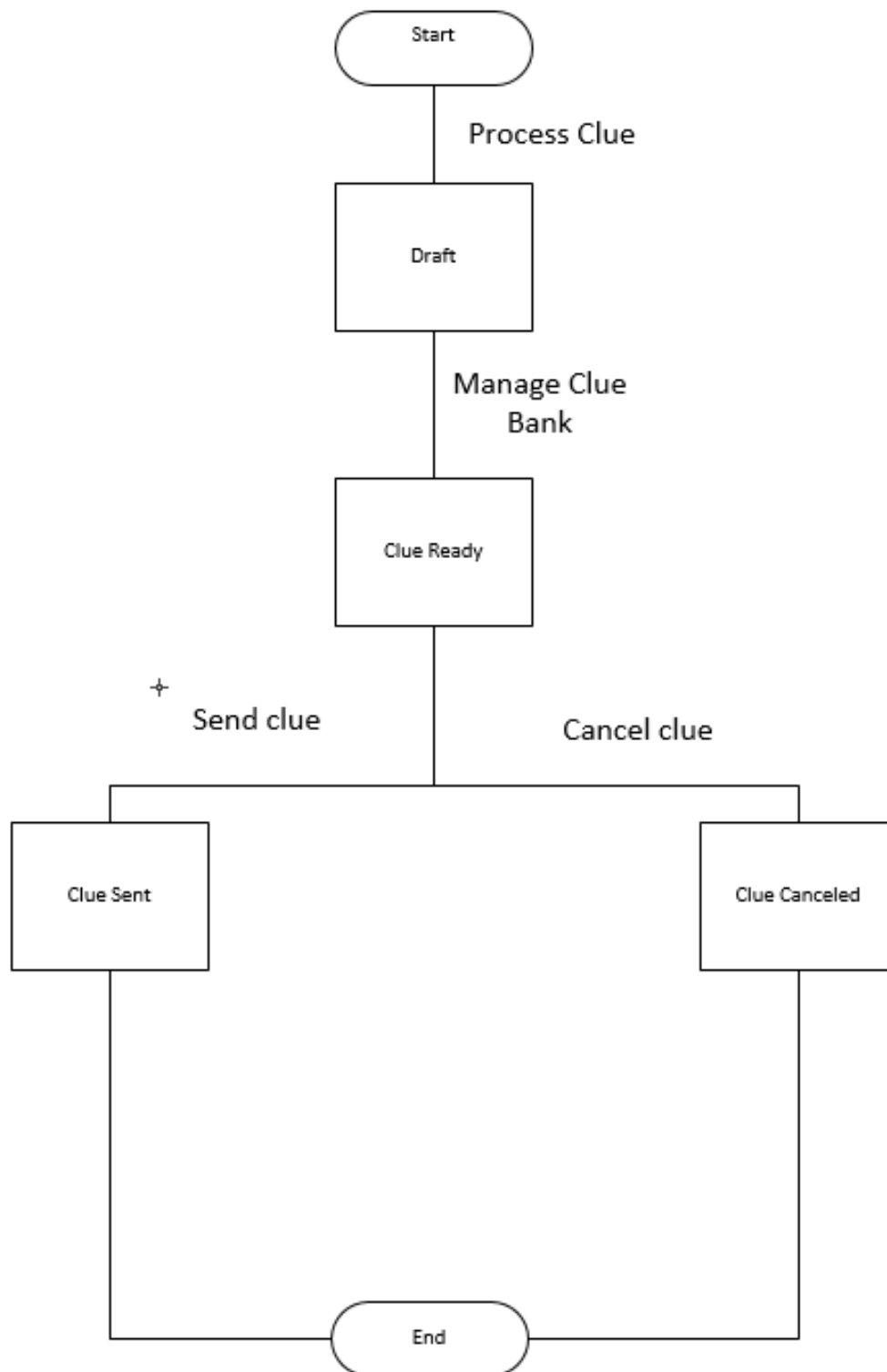+cancelSend()

Explanation of Relationships: An employee can monitor zero to many escape rooms, but an escape room can only have one employee. One employee can access the mobile app remotely, and the mobile can have zero to many users. A clue request can alert one escape room can only have one clue request at a time. An escape room can contain one and only one group, but a group can do zero to one escape room. A group can use zero to many clues, but a specific clue can only be sent to one group. The internal timer can schedule zero to many clues, but one specific clue can only use one-timer.
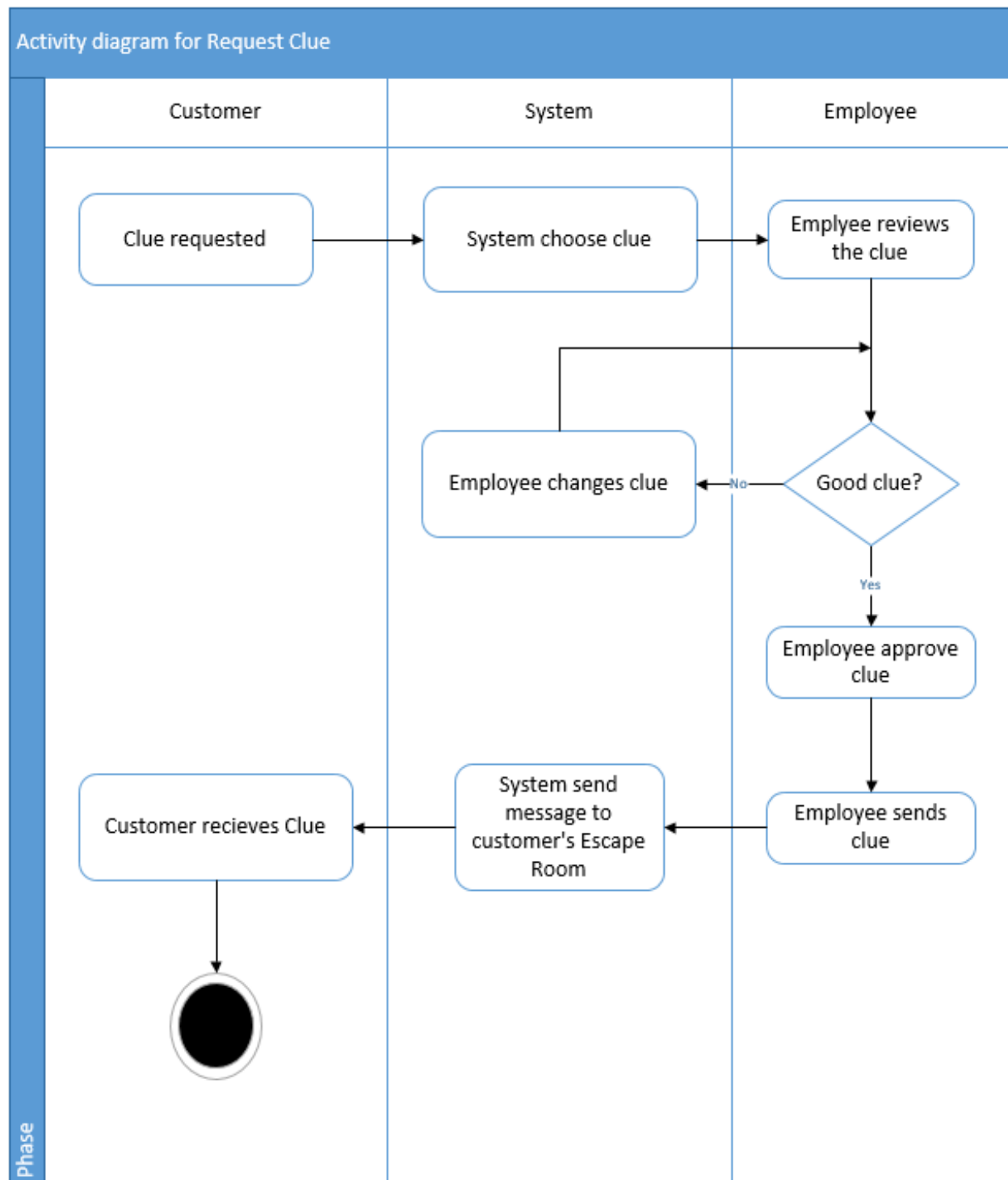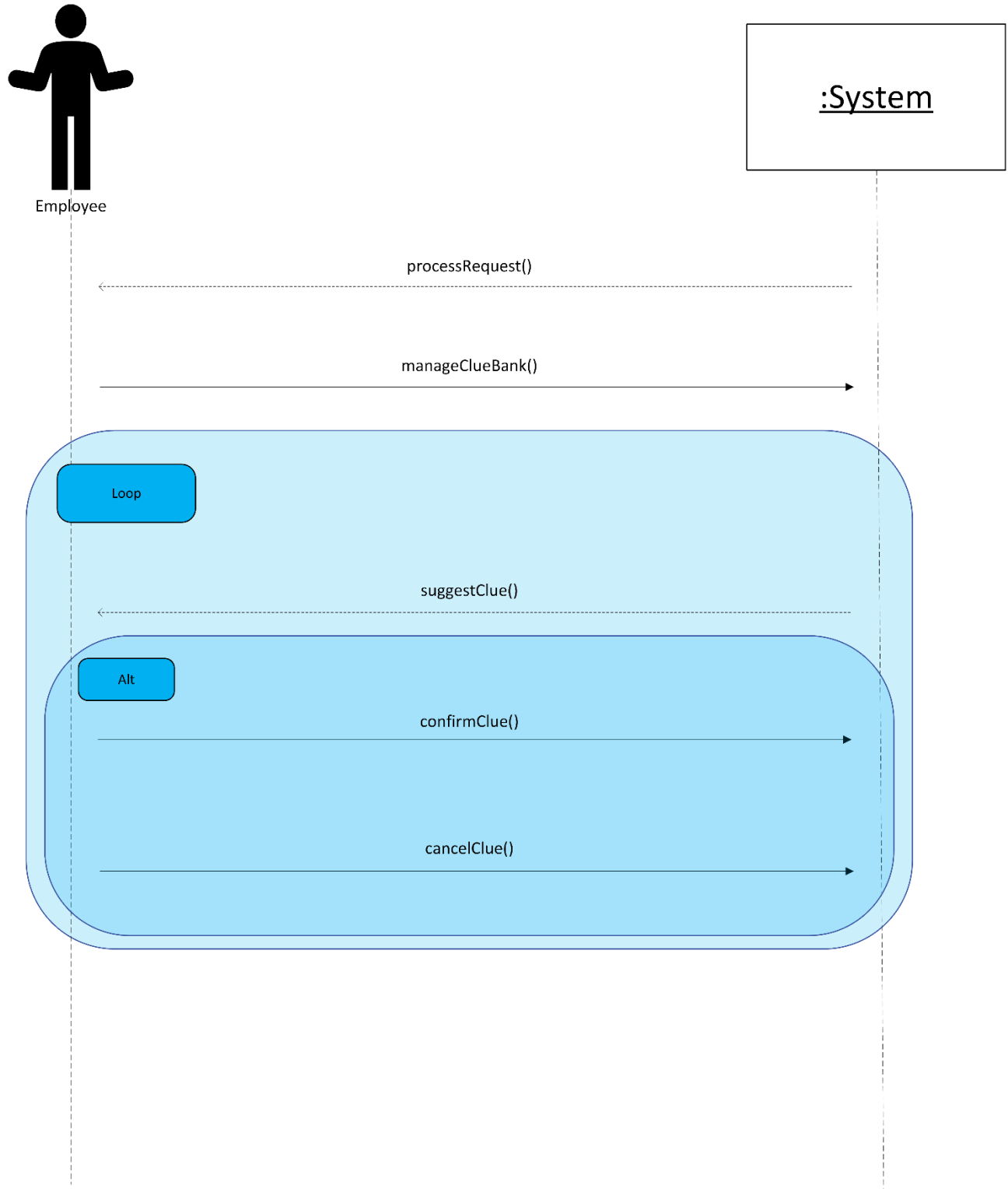
5. State Machine Diagram

Start

Process Clue

Draft

Manage Clue
Bank

Clue Ready

Send clue

Cancel clue

Clue Sent

Clue Canceled

End

6. Use Case Description For Request Clue

Use Case Name:	Request Clue
Scenario:	Customer wants a clue
Triggering Event:	Customer uses "Clue Button."
Brief description:	Customers press the "clue button" in the room. The system sends a message to the monitoring room computer, and the employee chooses which clue to send. Selected clues will be sent automatically after ten seconds.
Actors:	Customer, Employee, System
Related use cases:	This may result in the employee doing the Send Clue use case or the system conducting the Automated use case.
Stakeholders:	User, Management
Preconditions:	Clue-meister system must be available Customer needs a clue Employee is monitoring Customer room
Postconditions:	Clue is sent to customer room.

Flow of activities:	Actors	System
	1. Customer presses "clue button" 2. Employee reviews clue 3. Employee Sends clue 4. Customer receives clue.	1.1. System chooses clue. 2.1. Employee changes clue in the system if it does not fit 3.1 System sends clue
Exception conditions:	1. Customer does not request Clue.	

7. Activity Diagram For Request Clue

8. System Sequence Diagram For Request Clue

Employee

:System

processRequest()

manageClueBank()

Loop

suggestClue()

Alt

confirmClue()

cancelClue()

9. CRUD

Use case vs entity/domain class	Employee	Management	Customer	HQ (Upper-Management)
Create Employee Account	C	R		U, D
Request Clue	R, U, D		C	
Send Clue	C, U, D		R	
Update Subsystem		R		C, U, D
Produce Room Report		C, U		R, D