User Experience UX Design Integration

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1. UX Exploration Methodology

In order to guarantee the system is centered around the users and the experiences they will have, different design journey mapping techniques have been deployed that help understand several areas on how the application should function. But first of all, what are design journey mapping techniques? Well, mappings are simply visual representations that serve as an aid to understand the different aspects and processes that come with a product, including the users themselves and their experience. As such, this complicated idea implies the existence of several types of mappings to understand the product itself and its surroundings. The things one can find out will range from understanding the users themselves, their thoughts, and their behaviour, all the way to evaluating their current experience and recreating their ideal one. The diagrams used in mapping are based on the Nielsen Norman models (Nielsen Norman Group, 2017).

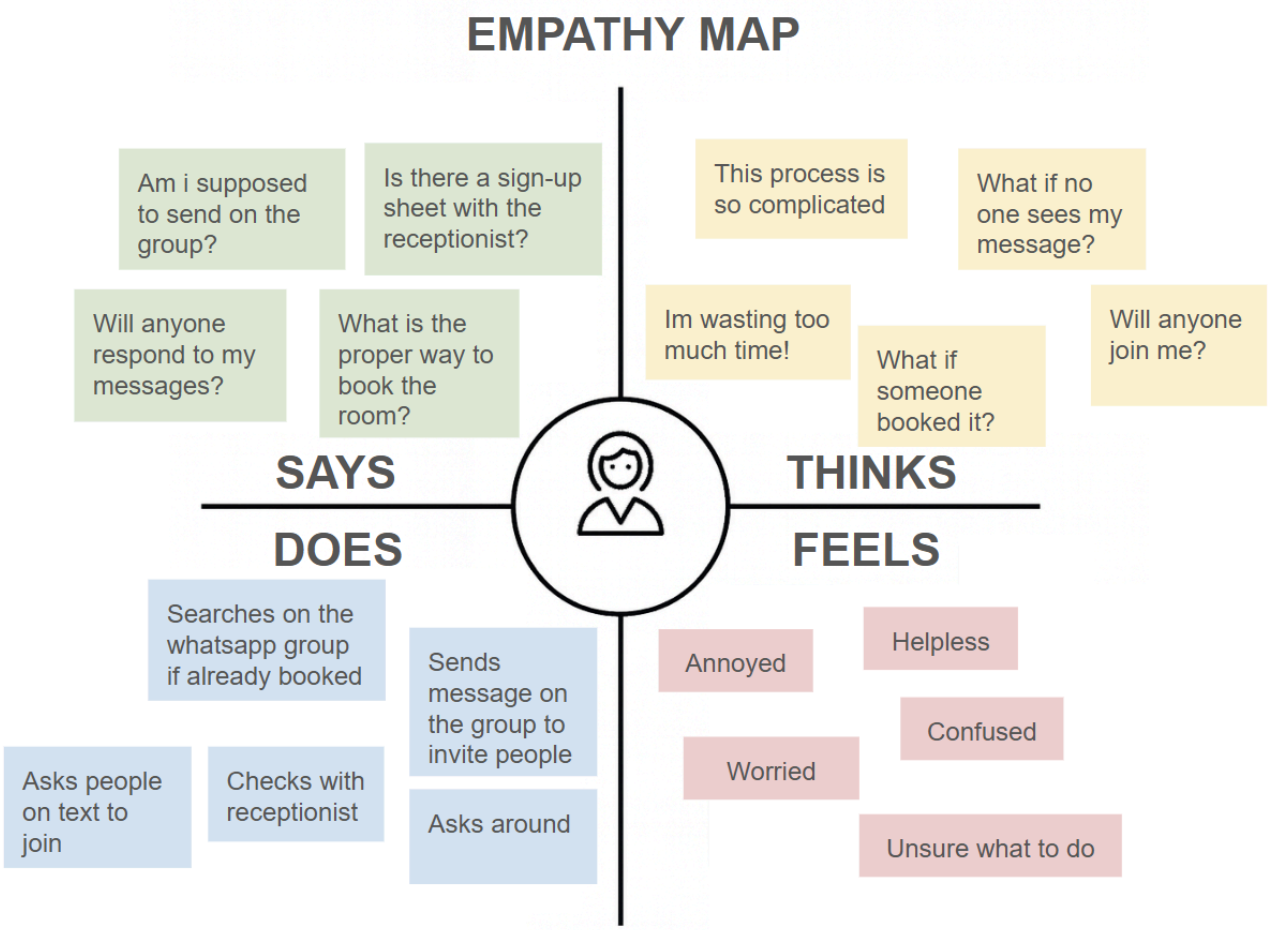
With this in mind, all the 4 distinct UX mapping methods have been chosen, and will serve the base for improving the current experience with their own justification for each:

- **Empathy mapping:** Empathy mapping is the method chosen to analyse the user's typical behaviors versus their initial feelings about this topic to analyse the opportunities to improve the user's experience.
- **Customer Journey Mapping:** Customer journey mapping is chosen to analyse the main pain points when it comes to performing a task and the customer's current approach.
- **Experience Mapping (as-is):** Experience mapping was chosen primarily as a way to represent the feelings of users in typical scenarios such as those presented with the personas in need finding. This will give detailed insight into how the current system is failing the users feelings.
- **Service Blueprint (to-be):** A service blueprint mapping will provide details as to how different users, such as the tenants and the staff, will interact with each other. This will also show parts of the system and other users work as the user interacts with them.

2. Empathy Mapping

The empathy map created is used as a way to compare the current reality of the user and the current actions they take in a certain scenario. The empathy map implements the current state of mind of the user before using our product. The four categories that are being explored are the “Does”- explores what the user currently does to in the scenario chosen, “Feels”- explores how the user currently feels in the scenario they are in, “Thinks”- explores what the user is thinking about in the current scenario, and “Says”- explores what the says out loud about this particular scenario.

The Scenario chosen is of Persona 4: “Tim Johnson” (refer to Activity 2: “Need Finding”, Section 5.1).



2.2 Analysis of the Empathy Map:

When analysing the empathy map you have to consider the current workflow and the current actions the user takes when put in this scenario and then you have to consider the things said by the user as well as their feelings, their thoughts, and what this gap in actions and feelings could mean.

Section Analysis:

Does:

The does section talks about what the user does when put in this situation and for our scenario, the user does a couple of actions to both book the room as well as inform others that they can join- He searches on the whatsapp group to check if someone already has the room booked, he checks with the receptionist, he also texts people both privately and on the whatsapp group to ask if they would like to join him, and he asks around if someone has the room as well as if people would like to join him.

Says:

The says section is for things the user says out loud when being put in this scenario. Our user stays asking questions, doubting the process as well as the wanted outcome. He wonders about how to do the process of booking the room where there could be multiple methods like sending on the group and signing up with the receptionist, he also wonders if anyone will see his messages and respond to them .

Feels:

The user's feelings are being analysed in this section where he feels a mix of emotions when completing this process. Some of the emotions include being confused and unsure, as well as annoyed about the process and worried that something will go wrong.

Thinks:

This area is being inferred from the other sections where the user is thinking about how frustrating the process is due to him having to send a lot messages and take

multiple procedures to book a room, he also think about the worst case scenarios that could occur where someone already booked the room but didn't answer his texts on the group, or the people didn't see his texts and won't show up.

Mapping Outcomes:

There are multiple outcomes you can infer from this empathy map and some include:

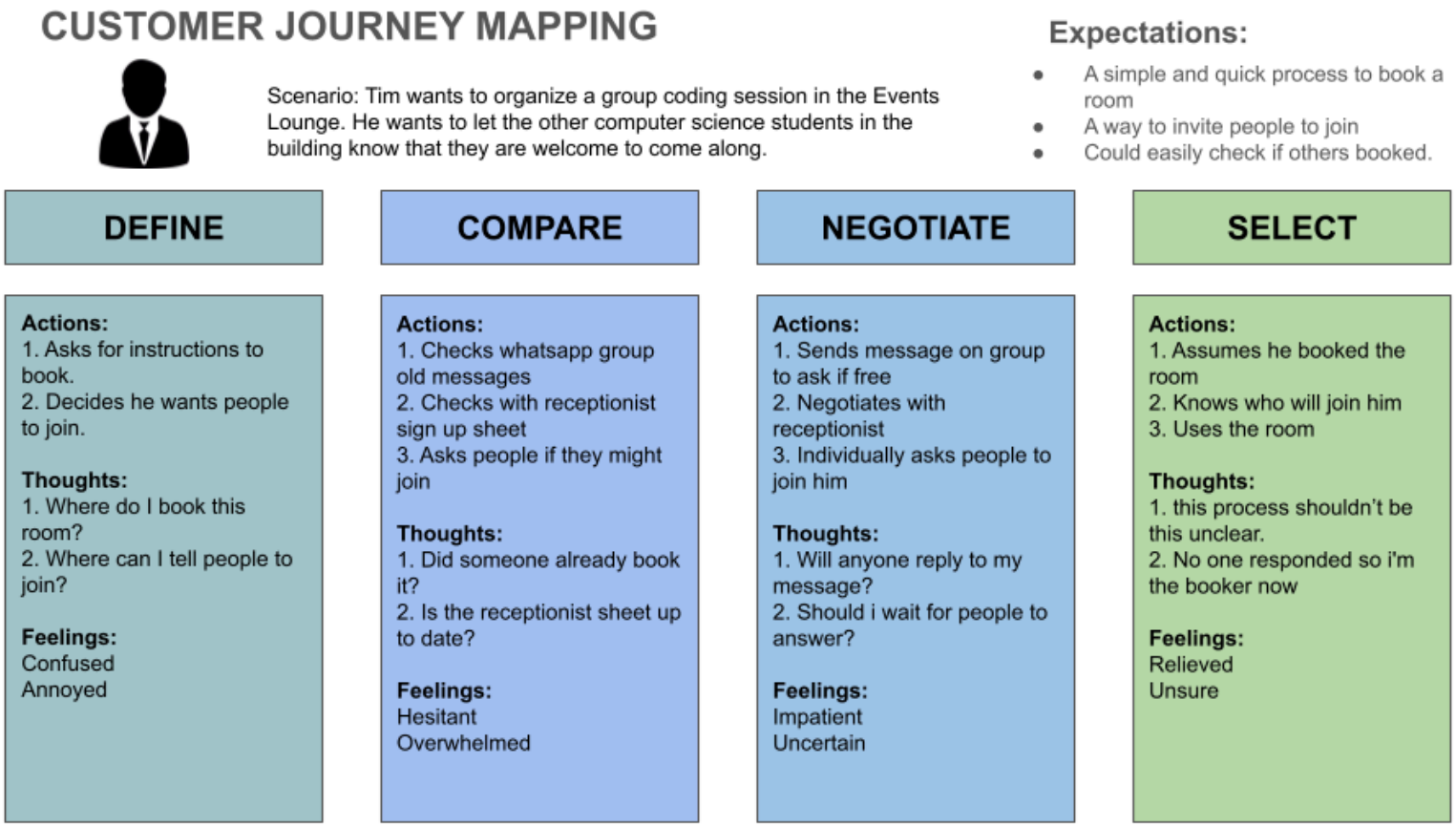
- **Problem:** From the actions of the user we can tell that he has to go through multiple processes in order to book the room such as searching for past messages on the whatsapp group, text other people, check with the receptionist, and from what he is saying and feeling he seems lost and confused about the process.

  Solution: The solution we have for this user is integrating our calendar view in order to see available time slots as well as having a non-functional requirement of making it easy to navigate so the user isn't confused about where to book from **NFR2**.
- **Problem:** After analysing the user's actions, he has to text on multiple channels in order to inform people about the opportunity to join his booking. He also feels worried that people wouldn't receive his invitation because of how hectic sending on the group is which is also evident by his thoughts.

  Solution: The solution to this problem is to create a feature that allows users to inform others about the opportunity to join their booking by changing the room's booking visibility from private to public which is one of app's functional requirements **FR7.**

3. Customer Journey Mapping

Customer journey mapping is used to track the steps taken by the user in a specific scenario, using the current workflow system, in order to complete a certain task. This is achieved by exploring the user's definition of the problem, comparison between the current system and alternatives, negotiations with the people in charge, and how the user selects his solution to the problem.



3.1.Analysis of Customer Journey Map

Define

The user defined his problem using actions, thoughts, and feelings: He feels confused about the process and asks around on how to book and how to allow people to join.

Compare

The user's actions to compare the different ways to achieve his goal where he checks on the whatsapp group for messages about previous bookings and also checks with the receptionist. He also wants to find out if people will join the booking and asks around. This makes him hesitant because of the many processes he has to check in order to book the room and so he thinks about the receptionist's accuracy as well compared if someone booked on the sheet or the group.

Negotiate

The user now feels impatient and wants to book the room and so he asks the group to check if someone booked it already as well as with the receptionist and asks around if people will join his session or not. Here he overthinks if someone already booked it but didn't respond as well as if he should wait before confirming his booking.

Select

This is the final process in the journey map where the user books the room and feels relieved that he has finally completed the task. He also has people that confirmed coming and joined the session.

Mapping Outcomes

After analysing this map, the specific problems that were identified are the lack of structure and guidance when booking, the extra steps needed to invite people and look for them, the chaotic schedule where it is being kept in two different databases, having to look for each booking and ask around. To solve these issues we have turned them into Functional requirements and Non-functional requirements that solve these issues and ensure the user's satisfaction.

4. Experience Mapping (As-is)

Experience mapping is used as a way to display particular scenarios and the feelings of a user in a particular circumstance. The key point to consider about experience mapping is that it represents the experiences as they are before any solution is implemented (as-is). This helps significantly to identify pain points and pinpoint them to a particular part of the process, which can then be improved with the product or solution.

The scenario chosen is of Persona 1: “Jane McFarm” (refer to Activity 2: “Need Finding”, Section 5.1) to describe the feelings and thinking of a user in a typical situation which is aimed to be addressed.

4.1. Experience Mapping (Jane McFarm)

Phase	1.Planning	2. The "Booking"	3. Approaching the room	4. Entering the room	5. The After part
User Actions	Decides to invite new friends over. Doubts about it, remembering the last time the room was trashed. Checks the WhatsApp group history.	Types a message: "Cinema Room 20:00 tonight?" Waits for a reply. Sees no objections, assumes she booked it.	Meets friends in the lobby. Walks towards the cinema room. Mentally prepares for a mess.	Unlocks the door. Finds empty bottles, stains and trash on the floor. The couch is broken.	Apologizes profusely to friends. They leave to go to a bar instead. Jane feels humiliated and angry but knows complaining in the chat won't fix it.
Thinking	"I really want to make a good impression." "Is it worth it?"	"Did anyone else book it? The chat is moving so fast." "I hope the previous group cleaned up."	"Please be clean. Please be clean." "I hope the equipment works."	"Oh no. Not again." "Who did this? There's no way to find out." "This is so embarrassing."	"I can't believe I live here." "Why is there no system to track who used this last?"
Feelings (High = good) (Low = bad)	**Anxious**	**Uncertain**	**Nervous**	**Mortified / Disgusted**	**Sad and frustrated**
Pain Points	**Lack of Trust:**She doesn't trust the facility's condition.	**Uncertainty:**WhatsApp offers no confirmation or status update.	**Blindness:**No way to check room status remotely.	**Lack of Accountability:**The mess is anonymous. Previous users face no consequences.	**Social Cost:**Damaged reputation with friends. **Frustration:**No formal way to report the issue.

4.2. Identified Opportunities

The previously shown experience map shows several pain points that can be developed in the new system in order to improve the user experience. By tackling these issues individually in each phase it can be ensured that the new system will provide, on average, a smooth and positive experience for the user. On the other hand, all of these issues and pain points should already be solved by the requirements developed in Activity 2: “Need Finding” meaning they will reinforce even further the justification for these requirements.

Phase 1 (Planning): Visual Verification

- Opportunity: Implement Real-time photo evidence viewing **(FR2)**.
- Impact: This addresses the user's "Lack of Trust" by allowing them to see the actual condition of the room before deciding to host an event, eliminating the initial anxiety.

Phase 2 (Booking): Certainty & Validation

- Opportunity: Provide Official confirmation **(FR1)**.
- Impact: This solves the "Uncertainty" of the WhatsApp system. Instead of assuming a message was seen, the user receives a concrete confirmation when booking, giving them confidence that the space is secured. Also the user is allowed to see the available spaces for a particular moment in time.

Phase 3 (Approaching the room): Remote Monitoring

- Opportunity: Create a "Cleanliness Status" indicator (Green/Red) **(FR2)**.
- Impact: This addresses the "Blindness" pain point. Users can check the app remotely to see if the room is marked "Ready" (Green) or "Not Ready" (Red) before walking down, managing expectations and reducing nervousness.

Phase 4 (Entering the room): Enforcing Accountability

- Opportunity: Implement ID linking **(NFR1)**.
- Impact: This targets the "Lack of Accountability." By linking every specific time slot to a verified user profile, the system discourages users from leaving messes, as they know they will be identified and held responsible.

Phase 5 (After part): Rapid Response

- Opportunity: Enable One-click issue reporting **(FR3)**.
- Impact: This resolves the feeling of "Powerlessness." Instead of complaining in a chat where it gets ignored, the user has a formal, instant channel to alert management, ensuring the issue is logged and addressed.

4.2. Outcome and Weak Spots

From the provided solutions a significant improvement in the process can be hypothesized. The decline in positive emotions represented in the curve could become smoother or non-existent at most points which signifies a generally more positive experience for the common scenario of Persona 1 (Jane McFarm). Nonetheless, certain weak spots in the opportunities and solutions are outside of the boundaries of the pain points that can be fully solved by the system, let us call them “exceptional situations”.

The main exceptional situation that is outside of the control of the system is when issues happen and are reported in between a particular time window. As context, it has been stated in the interview with the Residence Manager that the cleaning is only present during the mornings, excluding weekends (Appendix). This absence of cleaning possibilities during certain periods signifies a significant hindrance in the satisfaction of tenants.

Let us make up a more detailed scenario in which Persona 1 has booked the room for nighttime and it was stated to be clean and available. It has to be mentioned that there is no possibility of identifying the condition a tenant will leave the room in beforehand. Taking this into account, if a tenant leaves the room in poor condition in the time period between the cleaning crew beginning their absence and the scheduled booking time nothing can be done about the dirty state of the room. Even so, the system will let Persona 1 see the state of the room to prepare beforehand for this situation.

However, another exceptional situation can occur from this scenario. Reports outside of the staff’s working hours will usually be done by tenants who are going to their bookings as there is no possibility for the staff to verify the state of rooms while he is not on duty. This in turn means there is a slight possibility of Persona 1 being the one

who will first come across the incident and who will have to report it which would incite significant negative emotions in her experience.

Considerations to the Weak Points

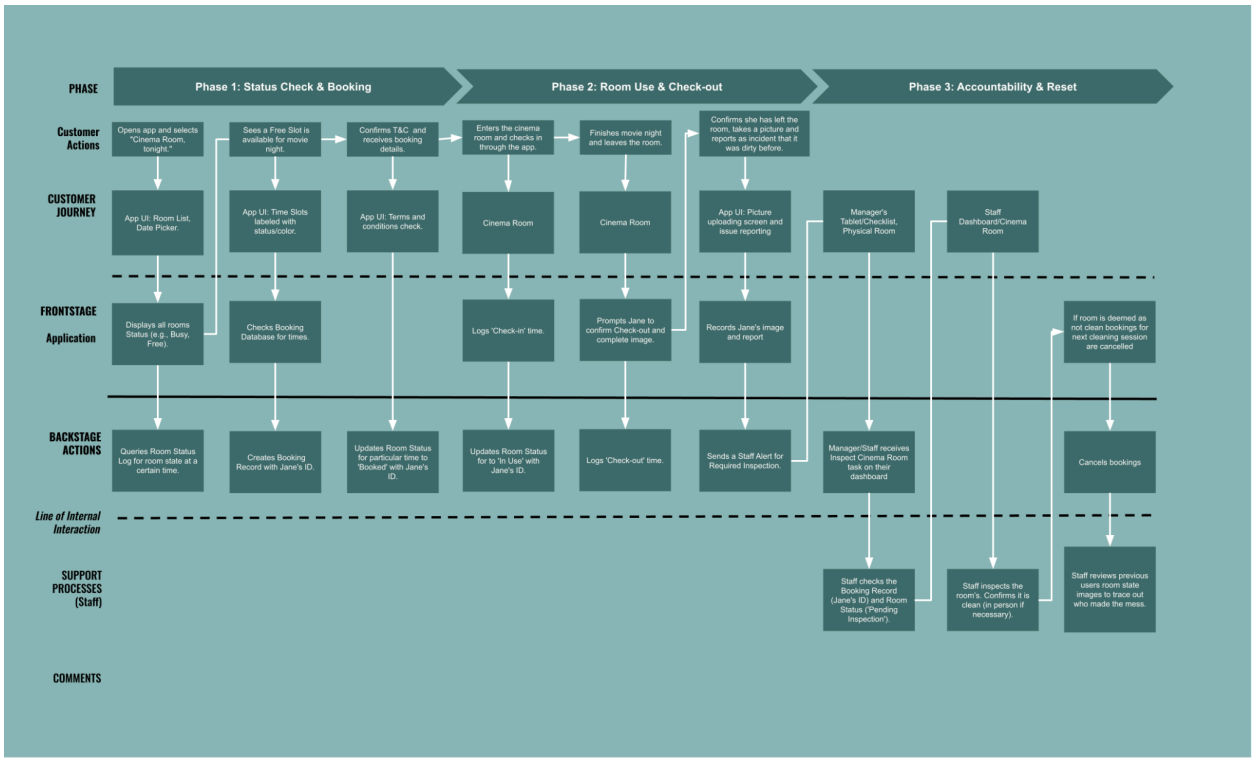
Even though the weak points presented from the exceptional scenarios cannot *actively* be solved by our proposed requirements and solutions, there are certain *passive* solutions that are brought by as a consequence of them which should reduce the incidence of these issues. For once, the ability of the staff to be able to identify the perpetrators, as well as having proof of breaking the terms and conditions, will lead to a more efficient distribution of consequences.

Research such as (Falk et al., 2013) provides perception into how often crimes are committed by repeated offenders. This piece of research utilized the nationwide multi-generation registry with information from all individuals born in 1958–1980 (2,393,765 individuals). Key insights from this study reveal that, as the title reflects: “The 1 % of the population accountable for 63 % of all violent crime convictions”. This in turns tells us that in most cases offenders or people breaking rules tend to have committed acts of the same kind before. Even though this research is reflected upon crimes in society, these insights can in some way or another be transferred into this analysis and how the new proposed system could passively tackle the weak points in question. The ability to identify perpetrators is pivotal here. When analyzing the issue from the perspective that rule breakers are usually the same group of individuals, it reveals that consequences are then not applied to a broad group of people, but more of a minor one. With this in mind, once the individuals have been identified, the staff can handle problems more easily and this in turn would reduce the total number of incidents as a whole.

Other important things to consider as proposed by (van Sleeuwen, Steenbeek and Ruiter, 2020), repeat offenders “show strong temporal consistency: they commit their crimes at more similar hours of day and week than expected”. This information reveals a pattern that can be found by the staff and then be solved accordingly, for example, by adjusting monitoring of shared spaces to be more strict in certain hours or days of the week.

5. Service Blueprint (To-be)

The Customer Journey Map shows how the user interacts with the program, but it doesn't take into consideration the detailed internal procedures needed to address Lumis's problems and the interaction of primary users with secondary users. We created a Service Blueprint to solve this. This approach was chosen to map the essential "Backstage" interactions that are necessary to comply with the project's Shared Non-Functional Requirements (NFRs) but are not visible to the user, particularly the database synchronization and identity verification procedures. This blueprint establishes a direct connection between the administration-managed Support Processes and the Frontstage user experience.



5.1. Blueprint Analysis

The end-to-end service scenario of a tenant booking a room, accessing it digitally, and verifying their compliance with cleaning criteria is shown in the diagram above. Five different layers make up the structure of the service:

Phase 1: Booking and Status Check

Customer & Frontstage. Jane chooses the "Cinema Room" and looks at the available times to start the tour. Importantly, before completing, the app asks her to confirm the terms and conditions (T&C). In accordance with FR5, this guarantees that users formally accept the house rules before to making a reservation.

Backstage Logic. After confirmation, the system modifies the room status to "Booked" for that particular period of time and generates a unique "Booking Record" connected to Jane's ID. Double-booking conflicts are avoided by this synchronization, which meets FR1.

Phase 2: Room Use & Check-out

Physical to Digital Bridge. Jane uses the app to digitally "Check-in" when she gets there. This occurrence is recorded by the system, which then modifies the room status to "In Use." This gives other users access to real-time occupancy tracking (FR2).

The Check-out Prompt. Jane is actively prompted by the Frontstage interface to confirm her departure as the session comes to a conclusion. This stage guarantees the room is released for the following time slot and is essential for correct utilization data.

Phase 3: Accountability & Reset

Reporting Incidents. In this particular instance, Jane observes that the room is unclean. During the check-out process, she can use the app to snap a photo and report the event right away. FR2 (Photo Evidence) and FR3 (Issue Reporting) are directly satisfied by this capability.

Automated Safety Response. The blueprint emphasizes a crucial automated response: the system automatically cancels reservations for the subsequent session if the room is judged "not clean" based on the report. This maintains user trust by preventing other users (such as the "Frustrated Resident" persona) from entering an evaluated mess before it’s cleaned.

Conclusion

The project effectively created a user-focused method for booking shared spaces using a variety of UX design tools, including Empathy Maps (for user feelings), Customer Journey Maps (for the entire experience), As-Is Maps (for the current problem), and a Service Blueprint (for the future solution). These tools revealed significant issues, including people's confusion or anxiety throughout the booking process and a general lack of confidence in the room's quality.

The investigation confirmed that poor communication, dispersed knowledge, and an inability to hold individuals accountable are the principal causes of the current system's failure. We developed a list of necessary features based on this, such as delivering official booking confirmations (FR1), displaying real-time images (FR2), and connecting reservations to an ID to guarantee accountability (NFR1).

The user's perspective (frontstage) and the required support actions (backstage), such as database updates and trouble reporting, are connected in the new Service Blueprint. Even though exceptional situations, such incidents that occur after hours, are difficult to totally prevent, the new approach assists by identifying the perpetrator and collecting information to lessen problems in the future.

In summary, the UX design process has produced a solid plan that goes further than simply making the previous procedure to work. Contrarily, it rebuilds the whole experience to give consumers a feeling of assurance, validation, and accountability. This makes sure that the finished result will not only function effectively but also be far more dependable and beneficial for all users of the place.