Optimizing Outpatient Flow and Resource Utilization: Y Dermatology Clinic (Tokyo)

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Module 7: Project Checkpoint 2

1. What is your topic and what have you done thus far?

Our project focuses on optimizing outpatient resource allocation and patient flow at a mid-sized dermatology clinic in Tokyo to minimize waiting time and improve throughput. After Checkpoint 1, we refined our topic based on Dr. Vivekanand's feedback, narrowing from a generic hospital model to a Japan-specific outpatient clinic scenario. We have contextualized the model using a real-world reference (*Y Dermatology Clinic near X Station*), documented its workflow and physical layout, and compiled synthetic yet realistic data on hourly patient arrivals, treatment complexity, service-time distributions and staffing costs. These inputs form the foundation for our linear-programming and simulation models.

2. What are you planning to do next?

Next, we will formalize the LP model to allocate physician and staff time optimally, and develop a discrete-event simulation to capture queueing dynamics under varying patient-arrival patterns. We also plan to experiment with a metaheuristic extension (e.g., simulated annealing) to fine-tune appointment-slot allocation and test sensitivity scenarios for weekday versus Saturday operations.

3. How can the instructor help?

We would appreciate clarification on:

1. Whether the metaheuristic component for this module should be implemented fully or conceptually illustrated alongside the LP formulation.

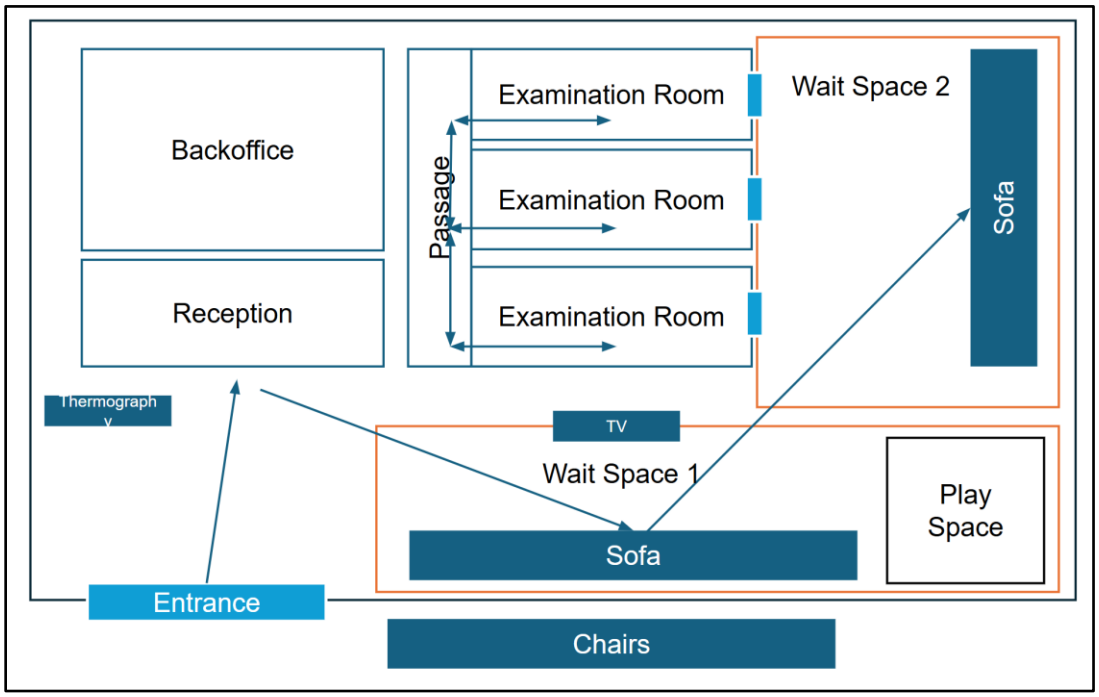
2. Where the final presentation file/link should be uploaded, since a discussion forum is not yet visible on Canvas.
3. Expectations for the Module 10 presentation: Our group members are located across four time zones (USA, UK, Japan and India), making it difficult to coordinate a joint recording; however, if having all members present is required, we will manage accordingly.
4. Confirmation that continuing with synthetic but realistic clinic-level data is acceptable for final modeling and analysis.

Appendix: Scenario Summary

1. Clinic Overview: Y Dermatology Clinic near X Station, Tokyo; 1 permanent doctor on weekdays, 2 on Saturdays, supported by 2 nurses and 3 receptionists.

2. Patient Flow: Reception → Wait Space 1 → Examination Room → Payment/Checkout; first-come basis with QR queue tracking.

3. Layout: Reception, two waiting areas (Wait Space 1 & 2), three Examination Rooms, Play Space for children.



4. Business Hours:

	Mon	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
09:00 - 12:30	Open	Open	Open	Open	Open	Open	Closed
14:00 - 17:30	Open	Closed	Closed	Open	Open	Closed	Closed

5. Peak Hours: 9 AM - 12 PM (elderly & infants) and 4 - 7 PM (working adults).

6. Service Categories: Simple (8 ± 2 min, 35%), Medium (15 ± 3 min, 50%), Complex (25 ± 5 min, 15%).

7. Sample Staff Cost Summary:

Role	Count	Hourly Cost (JPY)	Hourly Cost (USD)
Doctor	1 (weekday)	16,000	107
Nurse	2	3,000	20
Receptionist	3	2,250	15

(Detailed arrival-rate, disease and complexity distributions are retained for full inclusion in the Module 10 report.)