I. Problem Statement

This project aims to address the **systemic dysfunction** in the operation and service of modern university canteens. Through an in-depth analysis of the canteen service process (**Process Model**), we have identified six core communication barriers. These barriers are interconnected and collectively form a vicious cycle that impacts user experience and operational efficiency:

1. Peak Hour Communication Difficulties (P6) & Language/Understanding Barriers (P3): During peak hours like lunch and dinner, the canteen environment is noisy and crowded. This not only leads to long queues, wasting users' precious time (**linking to Persona 1 Liu Fan's pain point of "long queues consuming patience"**), but also makes the core communication scenario – ordering at the counter – inefficient and error-prone. The brief, vague communication between students and staff in a rush easily leads to issues like **getting the wrong dish or mishearing requests**, causing immediate dissatisfaction.

2. Information Delay (P2) & Poor Cross-Role Coordination (P5): Frontline staff are too busy dealing with the crowd to systematically and timely report collected feedback (e.g., "the dish is too salty today") to management (**blockage in the "Canteen Staff → Canteen Manager" path in the Process Model**). Simultaneously, the lack of an effective coordination mechanism between front service and back-end cleaning (**Logistics/Cleaning Staff in the Process Model**) leads to **untimely table cleaning**, further reducing seat turnover during peak hours and exacerbating congestion.

3. Low Online Platform Usage (P4) & Unclear Feedback Channels (P1): Existing online platforms (e.g., mini-programs) are not widely adopted due to poor user experience (**linking to Liu Fan's bad experience with "40-minute delivery"**), causing notifications and new dish information published by canteen management to fail to reach users effectively. At the same time, students are confused about "who to give feedback to" – tell the counter staff directly (might be ignored) or use online channels (doubt it will be handled)? This **ambiguity and ineffectiveness of the feedback path** (**linking to Liu Fan's quote: "It's troublesome and I feel like no one would handle it anyway"**) prevents user complaints from transforming into driving force for improvement, ultimately eroding their trust in the canteen.

These operational-level problems are directly projected onto the experience of two typical user types, creating two distinct dilemmas:

·**For the "Efficiency Seeker" Liu Fan:** The canteen's **core value – "proximity and time-saving"** – is undermined by the aforementioned problems (especially P4, P6). Long queues, ineffective communication, and unreliable online services make the time and decision-making cost of dining unacceptably high, turning the canteen from an "efficient energy refueling station" into an unpredictable "time sink."

· **For the "Health & Experience Enthusiast" Shen Wei:** The canteen's **deficiencies in health, transparency, and personalized service** (**linking to Persona 2 Shen Wei's frustrations with "greasiness," "information black box," and "lack of customization"**) prevent it from meeting her pursuit of a quality lifestyle. The unknowable dish information (**a manifestation of P2 Information Delay**), the lack of healthy options, and the monotony of flavors force her to either compromise or abandon the canteen. This reflects the canteen service's failure to keep pace with students' growing deep-seated needs for health, diversity, and a sense of participation.

In summary, the core problem of this project is: How can we, through systemic design, break down the communication and management barriers in the existing service process of the university canteen, reshape its core value, provide extremely convenient and reliable services for "Efficiency Seekers" like Liu Fan, while simultaneously offering transparent, healthy, and attractive dining experiences for "Health Experience Enthusiasts" like Shen Wei, ultimately upgrading the canteen from a functional "place to fill the stomach" to a trustworthy, efficient, and warm core node of campus life?

II. Proposed Solution

To systematically address the problems outlined above, we propose the **"Smart Canteen Service System: Canteen+"** design proposal. This proposal is not a scattered pile of features but an organically integrated system grown from the research of the first four parts, aiming to reconstruct canteen services across three dimensions: **Efficiency, Health, and Coordination.**

(A) "Canteen Assist" Integrated Digital Platform: Bridging Efficiency and Feedback Loop

This platform directly addresses the core demands of **Liu Fan and Shen Wei** and the **P1, P3, P4, P6** problems from the Process Model.

1. Precise Pre-ordering and Smart Pickup System:

·**Features:** Users can view the menu in advance via the mini-program, see the **estimated wait time accurate to the minute** (**echoing the scene in Storyboard 1 where Liu Fan sees "12 minutes" and decisively places an order**), and complete payment. The system generates a pickup code, allowing users to go to the **Smart Pickup Lockers** at the designated time to scan the code and retrieve their meal.

·**Problems Solved:**

·**Eradicates P6 (Peak Hour Difficulties) & Long Queues:** Shifts the "ordering-payment-waiting" process from offline to online, achieving user flow time-sharing.

·**Improves P4 (Low Online Platform Usage):** Rebuilds user trust in online channels through **reliable service promises (e.g., compensation for overtime) (targeting Liu Fan's pain point of "40-minute delivery"**).

·**Amplifies the Canteen's "Time-Saving" Advantage:** Achieves "pick up upon arrival," compressing the mealtime process to under 30 seconds (**as shown in Storyboard 1, Panel 7**).

2. Closed-Loop Visual Feedback Mechanism:

·**Features:** Establish a "Quick Feedback" entry within the mini-program, supporting text and pictures (e.g., photos of the dish). After submission, the system provides **status tracking** (e.g., "Received," "In Progress," "Resolved"). After the issue is handled, the user automatically receives a push notification with the result and an incentive (e.g., a 5 RMB voucher).

·**Problems Solved:**

·**Clarifies P1 (Unclear Feedback Channels):** Provides a single, clear official feedback channel.

·**Builds Trust:** Makes users feel "valued" through a transparent handling process and immediate incentives (**echoing Liu Fan's increased loyalty after receiving the handling notification in Storyboard 1**), encouraging continued participation.

(B) "Smart Choice Healthy Meal" Physical Zone and Operational System: Achieving Information Transparency and Experience Upgrade

This system directly addresses **Shen Wei's core demands** and the **P2, P5** problems from the Process Model, and implements the "Questioning Assumptions" and "Food Innovation" from the HMW.

1. Nutritional Information Visualization and Customized Service:

·**Features:** Establish an independent "Smart Choice Healthy Meal" zone offering salads, steamed dishes, whole grains, etc. Each dish is equipped with a **digital label** clearly displaying core nutritional data such as **calories, protein, fat, carbohydrates, etc.** (**as described in Storyboard 2, Panel 5**). Users can make personalized requests on-site like "less rice," "dressing on the side," or "extra vegetables."

·**Problems Solved:**

·**Shatters the Information Black Box (P2):** Makes nutritional information transparent, empowering users to make informed choices.

·**Meets Personalized Health Needs:** Directly responds to Shen Wei's desire for "less oil and salt" and "customization," breaking the inherent assumption that "canteens cannot provide healthy meals."

2. Themed Dining Activities and Social Interaction:

·**Features:** Regularly host events like "Mediterranean Diet Week" or "Local Specialty Food Festival," promoted via the mini-program and canteen notice boards. Establish a "New Dish Voting" feature, allowing users to participate in menu decisions.

·**Problems Solved:**

·**Enhances Freshness and Repeat Visits:** Attracts users like Shen Wei who seek new experiences through continuous content innovation (**echoing the HMW: "How might we leverage 'food innovation' to increase cafeteria revisit rates"**).

·**Builds Emotional Connection:** Transforms dining from a transactional behavior into a fun, anticipated, and shareable social experience (**as seen in Storyboard 2 where Shen Wei takes photos to share and participates in voting**).

(C) Back-end Collaborative Management Dashboard: Optimizing Internal Operations and Decision-Making

This system serves as the "nerve center" for canteen managers, designed to solve **P2 (Information Delay) and P5 (Poor Cross-Role Coordination)**.

1. Real-time Data Monitoring and Intelligent Task Dispatch:

·**Features:** Integrates front-end order data, user feedback, and inventory information. The system can automatically identify problem trends (e.g., concentrated negative reviews on a certain dish) and alert the manager promptly. Cleaning tasks can be intelligently assigned to logistics staff via the system, with completion status tracked.

·**Problems Solved:**

·**Eliminates P2 (Information Delay):** Enables managers to grasp operational dynamics in real-time and respond quickly.

·**Promotes P5 (Cross-Role Coordination):** Establishes a clear task flow, ensuring seamless connection between front service and back-end (e.g., cleaning), improving overall operational efficiency.

Summary: Our "Canteen+" system is a solution precisely cultivated from the research of the first four parts. It uses **digital tools** to solve efficiency and feedback problems, **product and operational innovation** to solve health and experience problems, and **data-driven management** to solve internal coordination problems. These three aspects work together, not only breaking down the six barriers from the Process Model one by one but also perfectly meeting the deep needs of the two core user groups, Liu Fan and Shen Wei, ultimately achieving a comprehensive upgrade of university canteen services.