

Queueless Canteen: Smart Food Access for Busy Campuses

Enabling students to make informed meal decisions during short breaks through real-time data.

The Core Problem

Campus students, who have only a 10-minute break between lectures, struggle to obtain meals due to unpredictable crowding, unclear menus, and uncertain food availability.

This uncertainty forces students to either wait in long queues or skip meals, leading to missed nutrition, reduced concentration in class, and increased stress.

Who Does This Affect?

Students

Students are the primary users who need quick access to meals during short lecture breaks. The system allows them to view menus, check food availability and waiting times, and place orders in advance. Student accounts are approved by the admin to ensure only enrolled college students can use the platform.

Canteen Staff

Canteen staff manage menu updates, food availability, and incoming orders. The system helps them prepare food based on real-time demand, reduce rush-hour pressure, and maintain smooth and efficient service.

Campus Administration

Campus administrators verify student registrations, monitor canteen operations, and address service-related complaints. They ensure the system runs smoothly and helps improve overall food service management on campus.

Meet Sakshi

The Busy Engineering Student

Age: 20 | **Role:** Undergraduate Engineering Student

Primary Goal: Get a proper meal during short lecture breaks without being late for the next class.

Key Pain Point: Uncertainty around queue length and food availability wastes her limited break time.

Context of Use: Between back-to-back lectures during peak lunch hours on a crowded campus.

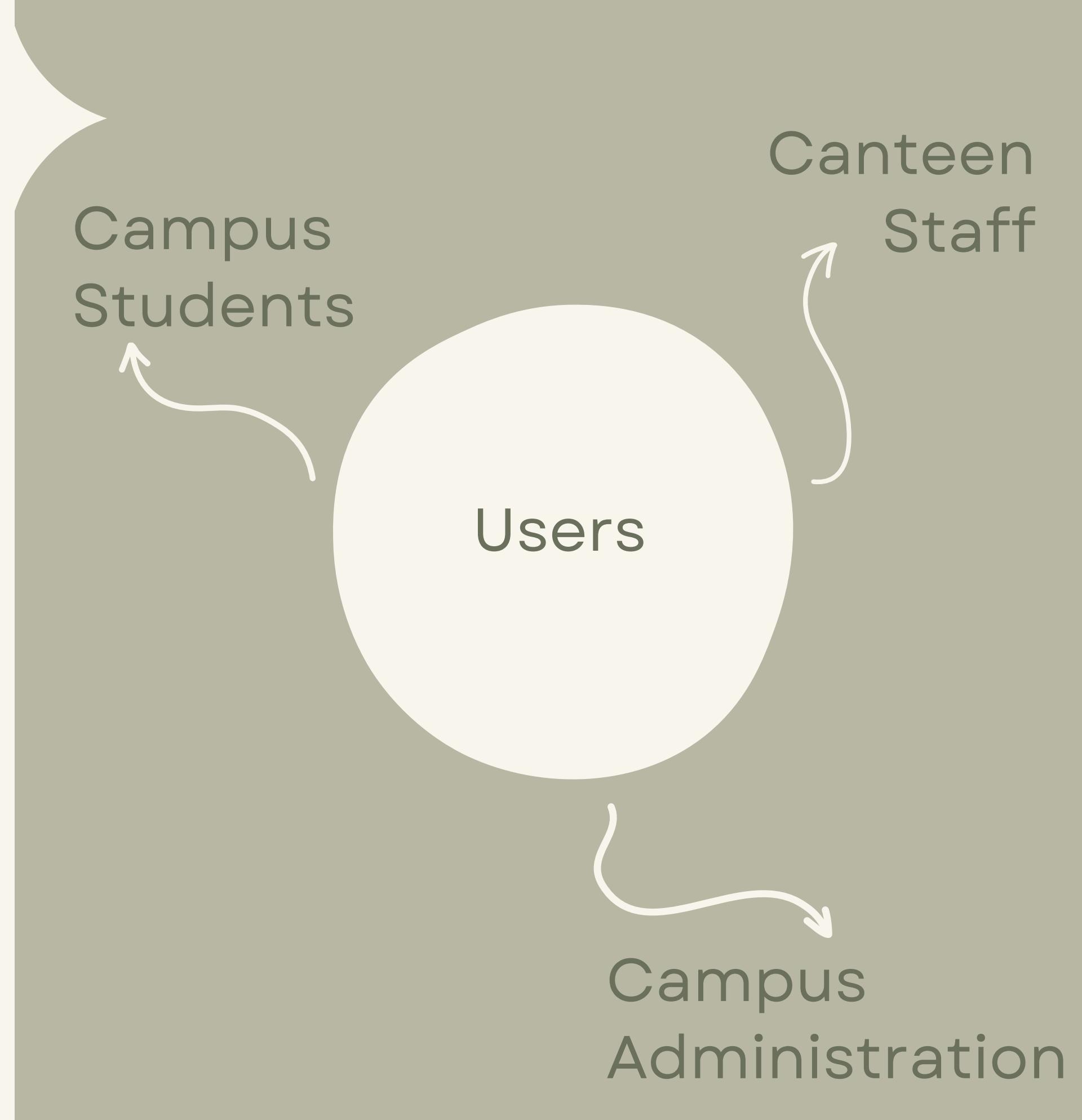
Lightweight BRD

Background:

On-campus students operate within tightly scheduled academic timetables, often having only brief gaps between lectures to meet basic needs such as meals. Campus canteens serve as a critical shared resource during these limited breaks, especially during peak hours.

Business Problem:

Students face significant uncertainty around canteen crowding, food availability, and waiting times, making it difficult to decide whether they can eat during short breaks. This results in skipped meals, reduced concentration in class, and increased stress. At the same time, canteen staff experience unmanaged demand surges, leading to operational strain and inconsistent service quality, while campus administration faces rising dissatisfaction related to food services.



User Journey

User (Student):

Lecture Ends

Student checks remaining break time (10 mins).

Check App

Views "Moderate Crowd" & Menu Availability.

Decision

Sees 5 min wait time.
Decides to go.

Purchase

Arrives, orders quickly, and eats.

Functional Requirements

- a. **The system shall** provide students with advance information about expected waiting time before they decide to approach the canteen.
- b. **The system shall** indicate whether specific food items are available or unavailable during a given time window.
- c. **The system shall** allow canteen staff to communicate changes in food availability or service capacity as they occur.
- d. **The system shall** reflect current demand levels so students can assess the likelihood of being served within their break.
- e. **The system shall** capture time-based demand patterns to support better anticipation of peak and non-peak periods.

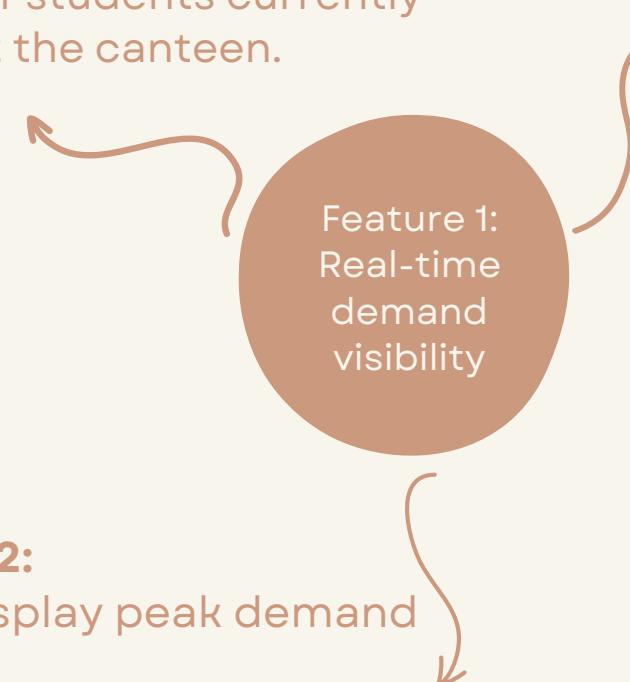
Non-Func*ci*onal Requirements

- a. Performance – Information must be updated within a short, predictable time window so students can make decisions during a limited 10-minute break.
- b. Availability – The system must be accessible during peak meal hours to avoid leaving users without guidance when demand is highest.
- c. Usability – Information must be understandable at a glance to prevent students from spending additional time interpreting details during already constrained breaks.
- d. Reliability – Data presented must consistently reflect actual canteen conditions so users can trust it when deciding whether to queue or skip meals.

Epics, Features & Work items

Epic: Enable students to make informed meal decisions during short campus breaks.

- **Work Item 1:**
 - **Title:** Track current queue lengths
 - **Type:** Story
 - **Description:** Monitor the number of students currently waiting at the canteen.



- **Work Item 3:**
 - **Title:** Verify demand data accuracy
 - **Type:** Task
 - **Description:** Ensure the captured queue and demand information reflects real-time conditions.

- **Work Item 2:**
 - **Title:** Display peak demand times
 - **Type:** Story
 - **Description:** Record and show historical patterns of high and low crowding periods.

- **Work Item 1:**
 - **Title:** Track available menu items
 - **Type:** Story
 - **Description:** Maintain a list of foods currently being served and those unavailable.



- **Work Item 2:**
 - **Title:** Notify staff of item shortages
 - **Type:** Task
 - **Description:** Enable canteen staff to update unavailable items quickly.

- **Work Item 3:**
 - **Title:** Audit availability data
 - **Type:** Task
 - **Description:** Periodically confirm that reported menu items match actual availability.

User Perspectives

- a. **As a student**, I want to know how crowded the canteen is before I go so that I can decide whether I have time to get a meal without being late for my next class.
- b. **As a student**, I want to see which food items are available during my break so that I can plan my meal and avoid arriving to find my options sold out.
- c. **As a canteen staff member**, I want to see expected student demand during each break so that I can prepare appropriately and maintain smooth service without being overwhelmed.

Acceptance Criteria

User Story:

As a student, I want to know how crowded the canteen is before I go so that I can decide whether I have time to get a meal without being late for my next class.

1. Acceptance Criteria:

- a. **Given** it is a scheduled break period, when a student checks the canteen, then the system shows the current number of students in the queue.
- b. **Given** historical data exists, when a student checks the canteen during a specific time window, then the system shows the average crowd level for that period.
- c. **Given** the canteen is empty, when a student checks the crowd information, then the system indicates that the canteen is clear and no queue exists.

Sprint Planning



Track current queue lengths

Foundational data. Students primarily need to know "How crowded is it?"



Track available menu items

Prevents students from wasting time queueing for sold-out items.



Verify demand data accuracy

Critical for trust. Inaccurate data leads to worse decision-making.



Notify staff of item shortages

Enables staff to update shortages quickly during rush hour.

Stories to Test Cases

User Story:

As a student, I want to know how crowded the canteen is before I go so that I can decide whether I have time to get a meal without being late for my next class.

Positive Test Case

- **Scenario:** The canteen currently has 10 students in the queue during a scheduled break.
- **Expected Outcome:** The student checks the crowd information and sees “10 students waiting,” allowing them to make an informed decision to join the queue.

Negative Test Case

- **Scenario:** The canteen queue data is temporarily unavailable due to a data capture issue.
- **Expected Outcome:** The student checks the crowd information and sees a clear notification that the current queue data is unavailable, preventing them from assuming inaccurate crowd levels.

QA Thinking & UAT

Risks if released without proper testing

- 1. Misinformed decisions by students** – If queue or food availability data is inaccurate, students may waste their short breaks waiting in long lines or miss meals entirely, reducing satisfaction and trust.
- 2. Operational strain on canteen staff** – Incorrect demand predictions could lead to unprepared staff during peak hours, causing long waits, errors in service, and inconsistent food quality.
- 3. Damage to campus reputation** – Frequent complaints from students about unreliable meal planning could reflect poorly on campus administration and affect overall student satisfaction.

UAT Checks a Business User Would Perform

- 1. Data Accuracy Verification** – Confirm that the reported queue lengths and food availability match the actual conditions in the canteen during peak and non-peak periods.
- 2. Timeliness of Information** – Validate that updates about crowding or menu changes are reflected promptly, ensuring that students can make real-time decisions within their 10-minute breaks.

See
you
at the
next
stage

Team Members

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