D-TILE Techniques Part I: Exploring Needs & Direction

Due: Mon, Sept 22 @ 12 pm
Submission: Please submit a PDF version of your assignment to Canvas.

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1. The Topic

In order to practice the process you're learning, you will explore a **problem space relevant to MIT students.** Your goal is not to solve the problem fully, but to begin applying the design-thinking steps to **frame the problem clearly and explore potential solution directions.**

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2. About the Context: MIT Student Life

MIT students juggle academic, social, and personal challenges every day. Whether it's staying organized, finding food that works with their schedule, managing stress, coordinating with peers, or accessing campus resources, there are countless moments where an interactive system could provide support.

For this assignment, imagine you are designing a **chat agent, lightweight software tool, or small interfacing device (e.g., Raspberry Pi or similar)** to help solve one of these everyday MIT problems. Select from one of the project idea/problems you highlighted in your day one poll.

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3. Example Problem Statement

MIT students often struggle with **meal planning and dining hall use.** Dining menus change daily, dining dollars run out quickly, and students with dietary restrictions may find limited options. Current solutions (like static menu websites or scattered group chats) don't personalize to student needs, leaving many students to waste time or money.

Therefore, we will innovate by creating a system that helps MIT students quickly determine:

- What dining options are available today
- Which meet their preferences (budget, dietary, location), and

- How to make efficient decisions in the moment.

(This is only one example; you may later pursue an entirely different MIT student problem such as academic planning, transportation, stress reduction, dorm life utilities, or accessibility.)

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4. Assignment Tasks

Complete each step below for the problem space you choose:

1. **Needs & Assumptions**
    - Identify at least **5 user needs** your system must address.
    - Write at least **3 assumptions** you are making about MIT students or the technology.
2. **Morphological Analysis**
    - Identify at least **3–4 different approaches** to solving this problem (e.g., chatbot, scheduling app, physical kiosk, Raspberry Pi dorm device).
    - Compare these approaches in terms of strengths, weaknesses, and fit for the problem.
3. **Stakeholder Analysis**
    - Identify at least **5 stakeholders** for your system (e.g., primary users, secondary users, administrators, technical maintainers, broader MIT community).
    - Map out their interests and potential influence.
4. **Boundary & Hazard Analysis**
    - Define where your system's responsibilities **begin and end**.
    - Identify at least **3 hazards or risks** (technical, ethical, cost, behavior change, adoption barriers).
    - Suggest at least one mitigation strategy for each hazard.

Hints for Success

- **Understanding the Problem:** Think about what *real MIT students* encounter daily. Problems should feel relevant, not abstract.
- **Needs & Assumptions:** Start obvious (“students need quick food info”) then push deeper (“admins need accurate menu entry; students need inclusive dietary filters”).
- **Morphological Analysis:** Look at real-world tools other organizations use, compare them, and decide what feels feasible.
- **Stakeholders:** Be specific but not too narrow; “Dining Services manager” is better than “MIT administration,” but broader than naming one individual.
- **Boundaries & Hazards:** Think beyond cost; what habits or barriers might make students ignore or reject your solution?
- **Class Tools:** Remember to use any tables and terminology gone over in lecture.