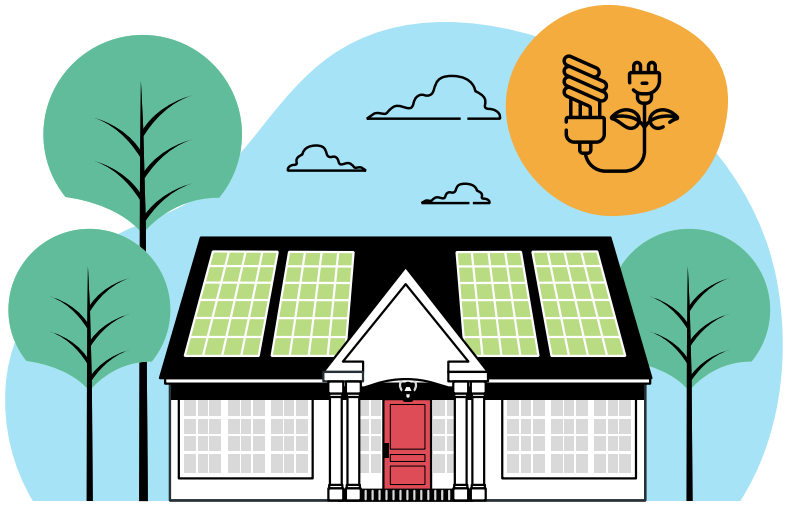


ENSE 405 Vlog 1:

EconergyCalc - Home Energy Calculator Application

By Archisha Bhattacharya

UN SDG(s) Selected

UN SDG 7 – Affordable and Clean Energy

Goal: Ensure access to affordable, reliable, sustainable and modern energy

UN SDG 11 – Sustainable Cities and Communities

Goal: Make cities and human settlements inclusive, safe, resilient and sustainable

Source: https://sdgs.un.org/goals/goal7, https://sdgs.un.org/goals/goal11

High-Level Project Vision (Business Case)

Background

- Address rising household energy consumption with increasing urbanization
- Traditional energy sources are often non-renewable and causes climate change and environment degradation
- Increase awareness among people

Proposed Project	EconergyCalc
Date Produced	October 15, 2023
Background	In line with UN Sustainable Development Goals 7 (Affordable and Clean Energy) and 11 (Sustainable Cities and Communities), this project addresses the pressing global challenge of household energy consumption. As urbanization continues to rise, energy consumption in residential areas is a critical concern. Also, traditional energy sources are often non-renewable and contribute to environmental degradation and climate change, many individuals need more awareness of their energy usage patterns and the ecological impact of their appliances.
Business Need/ Opportunity	The goal of this project is to create an innovative web application that empowers individuals to make informed decisions about their energy use, ultimately contributing to reduced carbon emissions and more sustainable living. Also, the project aims to empower individuals to make informed choices about their energy consumption, promoting sustainable living and, as a result, contributing to the reduction of greenhouse gas emissions and environmental impact.
Options	1. Build an interactive web application where users can add or log the electrical appliances they use regularly in their household and receive their total energy consumption. 2. Use available online energy calculator tools. 3. Do nothing

Business Need/Opportunity

- Create an interactive application for users to keep track of their household energy consumption
- Empower individual to make informed decision about energy use and adopt sustainable practices

Envisioned Impact

- The project aims to empower individuals in average Canadian households to make informed choices about their energy consumption, promoting sustainable living and, as a result, contributing to the reduction of greenhouse gas emissions and environmental impact.

Current Technology Inventory

Platform

Platform	Smart Home Applications (Example: Google Home)		
Supported activities	**Tools**	**Key features**	**Usage notes**
Individual participation	- Integration with a variety of home appliances via IoT. - Adding new appliances using Bluetooth, Wi-Fi, or scanning QR codes. - Interactive interface allowing users to easily update or remove appliance details.	- Comprehensive inventory management where members can log and categorize their appliances. - Interactive interface allowing users to easily update or remove appliance details.	- Appliances are automatically identified and their details (power rating, model, brand, etc.) are stored securely. - Potential for integration with manufacturer databases for automatic specification retrieval.
Service context	- Real-time monitoring of appliance usage. - Algorithms to calculate energy consumption based on appliance details and usage duration.	- Dynamic energy consumption display: Application processes and presents data on-the-fly. - User-friendly dashboard showing the breakdown of energy usage per appliance.	- Visual representation of energy patterns with graphs showcasing daily, weekly, and monthly consumption. - Application provides insights but might not offer holistic solutions for energy reduction or tailored sustainability suggestions.

Current Technology Inventory

Stand-alone Tools

Stand-alone tool	**Online Energy Consumption Calculator**		
Supported activities	**Tool**	**Key features**	**Usage notes**
Service context	- User-friendly interface with fields for appliance details: power rating, usage duration, quantity, etc. - Option to add multiple appliances for a collective energy consumption report.	- Efficient algorithm to calculate energy consumption based on user input.	- The energy consumption result is static, reflecting a snapshot based on the time of calculation. - Users should be aware of the specific metrics the calculator uses and ensure their input aligns with those metrics. - While this tool provides quick calculations, users might need real-time monitoring tools for more dynamic and detailed insights about their consumption trends.

Current Technology Inventory

Stand-alone Tools

Stand-alone tool	**Online Forums (Example: Reddit, Quora)**		
Supported activities	**Tool**	**Key features**	**Usage notes**
Content, Access to expertise, Relationships, Community cultivation	- Interactive platform allowing users to generate topics or threads for discussion. - Built-in tools for content categorization, tagging, and searching. - Feature to upvote, downvote, or mark answers as helpful/unhelpful.	- Community-driven knowledge sharing, with real-time feedback on questions posed. - Mechanisms to highlight or pin top answers or important threads. - Ability to connect or follow other users, creating a network of expertise. - Moderation tools to ensure content quality and maintain community standards.	- Creates a digital habitat for users to share their knowledge and clarify questions. Topics of discussion in these habitats can be multiple. - No forum available for niche topics such as sustainability in household energy consumption.

Current Technology Inventory

Stand-alone Tools

Stand-alone tool	**E-commerce Websites (Example: Amazon)**		
Supported activities	**Tool**	**Key features**	**Usage notes**
Content	- User-friendly interface for seamless product browsing. - Search bar with advanced search capabilities and auto-suggestions. - Product pages with detailed descriptions, images, reviews, and ratings.	- Ability to use filters like "eco-friendly" or "sustainable" to narrow down product selections. - Recommendation engine suggesting similar or complementary products.	- E-commerce sites are valuable resources for finding a vast array of products, but users should read product descriptions and reviews carefully. - While filters can help find sustainable products, it's essential to verify the sustainability claims through product certifications or independent research.

Audience and Community Orientation

Primary Orientations

Individual participation Learning together happens in the context of a group, but it is realized in the experience of individuals. People bring different backgrounds, communication styles, and aspirations to their participation in a community. People have different levels of commitment, they take on different roles, and they use tools differently	☒ Levels of participation ☒ Personalization ☐ Individual development ☐ Multi-membership	Each user's engagement is unique, stemming from their household setup, energy consumption habits, and personal sustainability goals. By inputting an inventory of their appliances and energy use, they receive personalized insights and recommendations. Furthermore, while the community forum serves as a collective platform, individual contributions therein enrich the knowledge base, with users choosing to share experiences, ask questions, or offer advice.	**Service context** In some cases, serving a specific context becomes central to the community's identity and the ways it operates. They may live inside an organization, whose charter their practice needs to serve. They may have a mission to provide learning resources to the world or to recruit members widely. Or they may seek interactions with other communities whose domain complements their own	☒ Organization as context ☐ Cross-organizational ☐ Other related communities ☐ Public mission	The primary service context includes facilitating individual users in optimizing their energy consumption patterns and, on a broader scale, contributing to national and global sustainability goals. By empowering users with data and actionable insights, the platform champions an eco-friendly ethos, aligning with wider environmental initiatives and potentially collaborating with external bodies that share a common vision.

Audience and Community Orientation

Secondary Orientations

Content Some communities are primarily interested in creating, sharing, and providing access to documents, tools, and other content. Valuable and well-organized content is a useful resource for members	☐ Library ☐ Structured self-publish ☒ Open self-publish ☐ Content integration	While the application's primary goal revolves around individualized household energy insights, there exists a potential avenue for content sharing and consumption. By facilitating a space where users can share their knowledge, experiences, or even success stories in the form of posts, the community can benefit from diverse perspectives and real-world experiences. This user-generated content can serve as a valuable resource, enhancing the overall user experience and fostering a sense of community collaboration.

Drafting an Emerging Picture

How well does the technology inventory cover the orientations? What themes emerged from both the community orientations and the technology configuration from your colleagues' notes	The existing technology inventory reveals a scattered landscape where users have to navigate multiple systems or applications to fulfill varied community orientations. While online forums excel in content sharing and fostering relationships, Smart Home Applications offer individualized energy insights, and Online Energy Consumption Calculators provide specific, one-time metrics. E-commerce platforms align with sustainable product discovery. This fragmentation means users lack a centralized, integrated platform that holistically addresses their needs, resulting in potential inefficiencies and missed opportunities for a more cohesive community experience.
☐ Are you almost there? ☒ Are there big gaps?	There are significant gaps. While the existing technology covers several community orientations, the lack of integration results in users navigating multiple disjointed platforms. This fragmentation presents inefficiencies and hinders a seamless community experience. An integrated platform would be instrumental in addressing these gaps, offering users a comprehensive solution.
What is the range of skills? If their interests and/or skills are diverse, could it cause conflict or distraction?	The range of skills within the community is diverse, spanning from novices seeking basic information to experts sharing advanced insights. While this diversity enriches the knowledge pool, it could lead to potential conflicts or distractions, especially if expectations aren't managed. Differences in understanding or approach might result in debates, and the diverse skill set might divert the community from its core focus at times. Proper moderation and clear guidelines are essential to harness this diversity positively.

- Scattered platforms and tools for the community orientations which lack personalization
- Needs to be integrated under one platform for ease of use

Envisioned Constraint

Options

1. Build an interactive web application where users can add or log the electrical appliances they use regularly in their household and receive their total energy consumption.
2. Use available online energy calculator tools.
3. Do nothing

Cost-Benefit Analysis

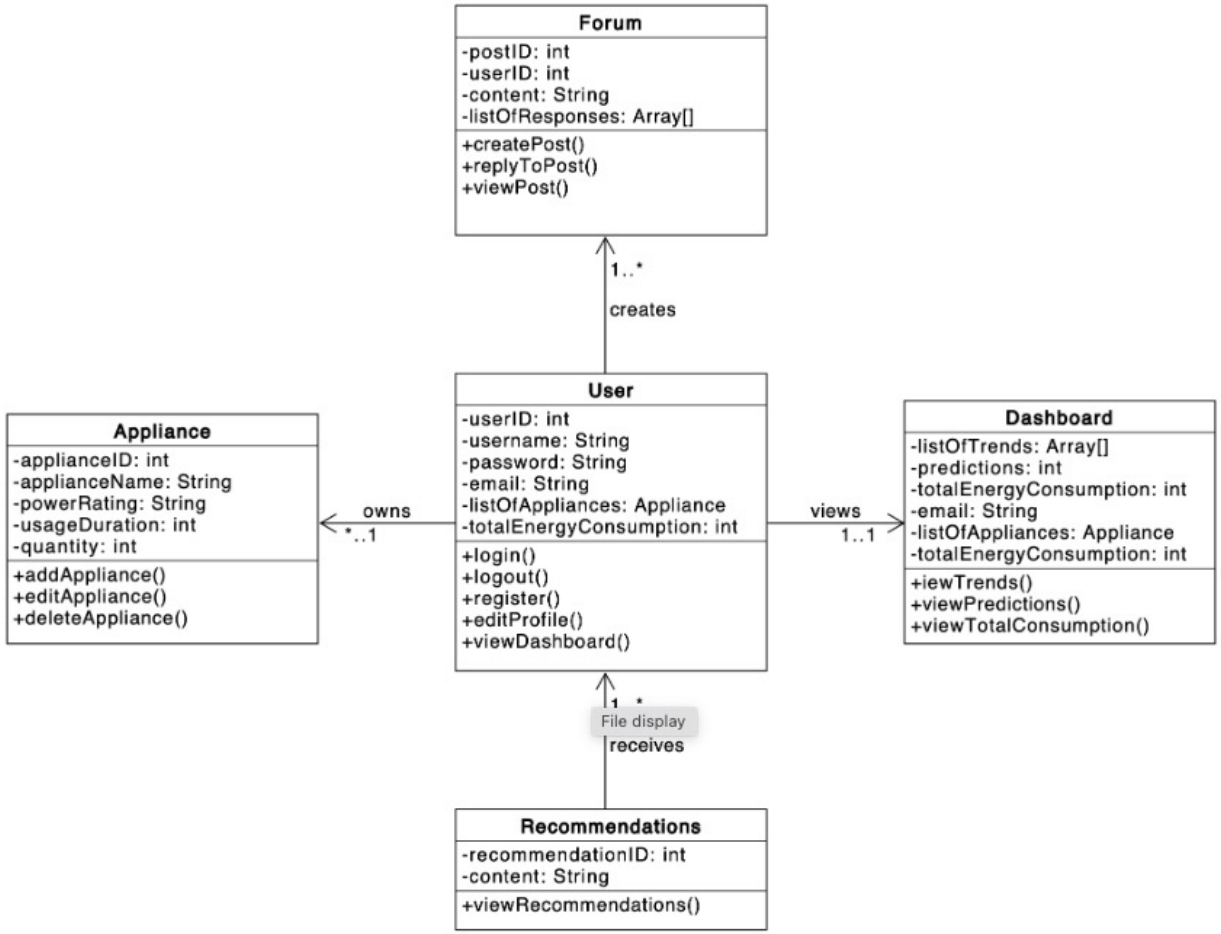
1. Build an interactive web application.

Cost	Benefit
Will require development costs such as Software development tools and licenses, cloud services and API subscription costs. Will require training and knowledge on MERN technology stack	Users will receive estimated energy consumption. User will receive recommendations and tips to reduce energy consumption and adopt sustainable practices. Application will keep a log of the user's appliances and provide consumption trends. Use a community forum to share tips and recommendation about energy saving

2. Use available online energy calculator tools

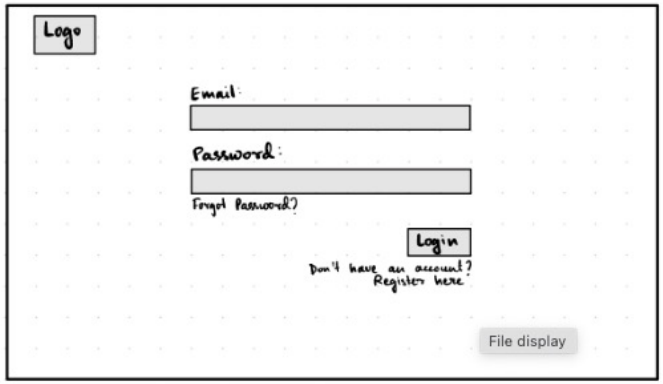
Cost/Disadvantages	Benefit
No log can be kept user's appliances. Cannot perform consumption trends specific to the user. Give generalized tips to reduce energy consumption instead of personalized recommendations.	Free of cost

Software Architecture

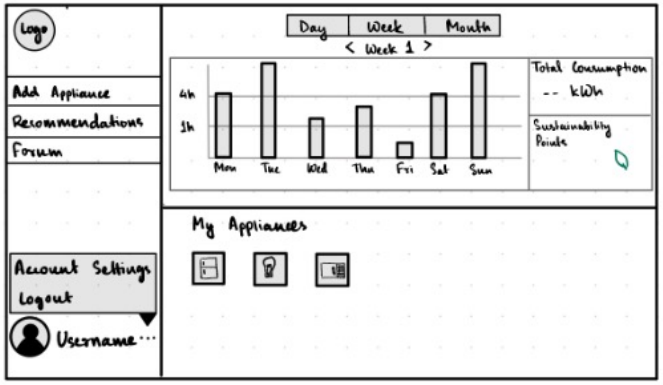


Prototypes

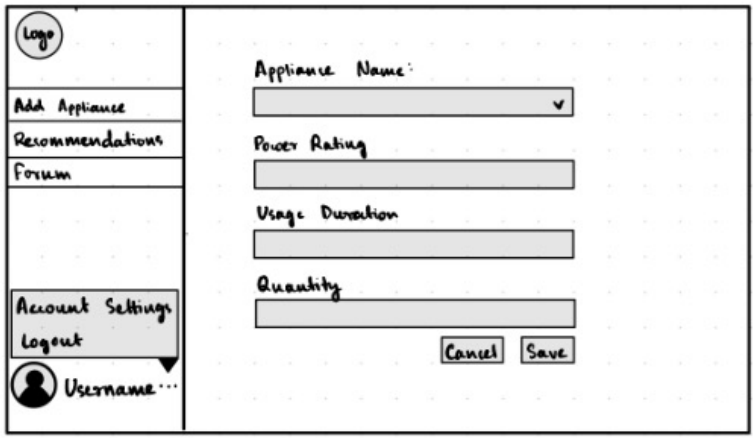
1. User Authentication: Login/Sign-up Page



2. Dashboard

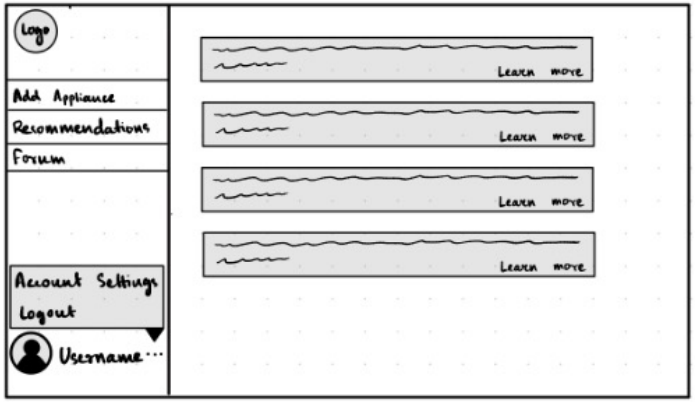


3. Add Appliances

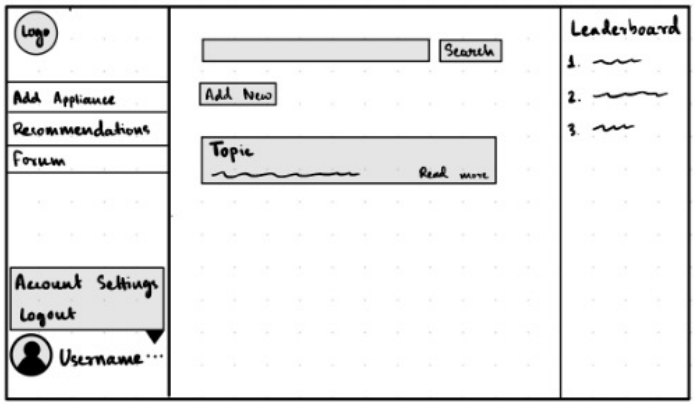


Prototypes

4. Recommendations



5. Forum



Thank you!