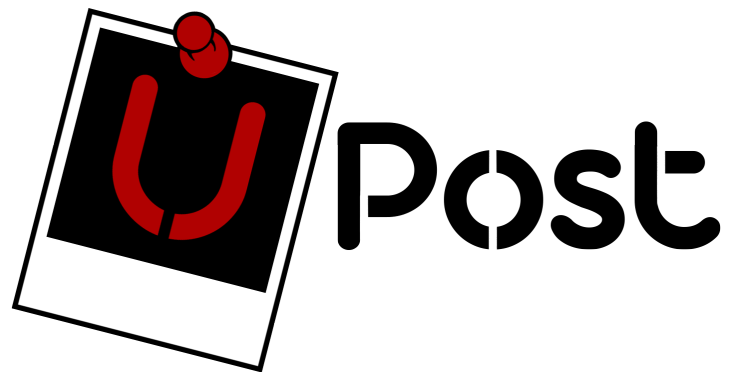


# U-Post Capstone Project Proposal



**Date:** May 10<sup>th</sup>, 2019

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**Academic Advisor:** Dr. Mohammad Moshirpour

**Project Industry Sponsor:** Naser Arda, Hunter Hub - Social Enterprise Portfolio

**Project Owner:** Megan Leslie

## Introduction

As a member of the University of Calgary community, it is hard to ignore the cluttered bulletin boards, filled with posters displaying a wide variety of events, services, and advertisements that few people actually take the time to read. This outdated method of communicating events and services not only limits the effectiveness of event awareness and attendance; it also creates a large amount of paper waste. In addition, this method does not allow for real-time updating, data analysis, forecasting capabilities, and the numerous advantages of a digital platform for events. In addition, food waste after events is an increasing concern especially for large communities, such as universities.

In the 2019 Winter semester at the University of Calgary, we tracked the evidence to support these problems and found that there were approximately 25 university-related events per day, the average capacity reached was 60%, and this resulted in nearly 2.5 garbage bags filled with food waste per day from events alone. Our U-Post team believes that through the help of an effective software platform we can help tackle these problems simultaneously to connect our community while reducing waste<sup>1</sup>.

## Objectives & Motivation

Two main questions motivate our team to develop U-Post. First, is there a one-stop-shop to see everything that is happening in your community/campus right now? Second, can excess food become part of an incentive strategy to improve event attendance, community awareness, and waste reduction?

Objective 1: Online Digital Bulletin Board – A one-stop-shop for all community/campus events, services, and advertisement. Similar to how YouTube contains videos or how Netflix contains movies and series; U-Post aims to contain all community-related events and services.

Objective 2: Waste Reduction Strategy – A community of hungry students and throwing delicious food away doesn't make sense, right? Printing 100 posters in the digital age doesn't make sense, right? Planning an event for 100 people and only 20 show up doesn't make sense, right? What do you do with all the extra food, supplies, space, and paper that is not being utilized? We want to make sense of sharing extra food, we want to make sense of paper-less advertising, and we want to make sense of reaching capacity at events/services.

**U-Post will provide a one-stop shop for event/service communication, allowing providers to post event/service details while increasing event awareness and providing a social and environmental impact.**

## General Scope

The scope of the project is to develop a web-based platform and mobile website. This includes a user-friendly front-end and a cloud-based back-end to ensure U-Post is scalable. The software-developing framework will be discussed with our technical supervisor, Dr. Moshirpour, and will allow our team to develop an efficient, scalable, and user-centric product. Our team will be using agile development principles, which will include constant iterative development and possible integration of new technologies throughout the project. Our initial features in scope are the following:

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1. Proposal based on U-Post Project Proposal ENSF 619-06, Winter, 2019, Mulia, Woods, Cheung.

- Content Personalization Strategy – exploiting visitor data to deliver relevant content based on their interests and preferences.
- User-centric Website – easy to use and intuitive for users based on the designs of existing platforms such as Netflix and YouTube.
- Real-Time Updates – allows service/event providers to send updates and posts to individuals interested and/or already registered for their event/service.
- Waste Reduction – allows service/event providers to send an announcement to U-Post users to let them know that there is free food/items leftover from an event. This tool can also be used if an event has unanticipated low attendance to draw in new attendees on the spot.
- Analytic Reports – provides service providers with key metrics regarding the effectiveness of their post, events, etc.
- After Event Content Access – allows service/event providers to release content to individuals who have successfully attended the event.

If time allows, we want to complement the web-based platform by starting development of an IOS or Android application.

## Proposed Methodology & Approach

Our team will be working with our technical supervisor to determine which software development models and tools will produce the best platform for efficiency, scalability, and user-centric design. Our initial approach will be the following:

### Front End – React Framework (JavaScript)

JavaScript is selected for the development of our frontend of our website due the many advantages offered by JavaScript. These advantages include: speed (easily runs with in the client side browser), popularity (resources are abundant and plentiful), dynamic nature (ability to download libraries at runtime), and web browser support [1], [2]. Our selection of JavaScript stems largely from the flexibility offered by JavaScript and the support offered by modern web browsers [2].

React is a JavaScript library used for building user interfaces and is described as the View in a Model-View-Controller (MVC) design pattern [3], [4]. React is selected for this project as it provides an efficient event-based system and promotes creation of testable and reusable components [5].

### Backend – Django Framework (Python)

Django follows a Model-View-Template (MVT) pattern based off the MVC pattern. Django's model utilizes an Object-Relational-Mapping (ORM) layer which simplifies database and data operations [6]. Django also provides flexible framework capable of building deep and dynamic websites in a short amount of time, to do so Django offers high-level abstractions of common Web-development patterns [7]. These benefits coupled with the ORM make Django suitable for our project as we aim to complete our project in the short timespan of four months.

### Rest API

Rest API will be used for communication between the frontend and the backend of our proposed website as Django offers a built-in rest framework which helps to simplify communication.

### Infrastructure – Amazon Web Services (AWS)

With the three major cloud service providers (AWS, GCS, Azure), choice of a cloud service provider relies on a few key factors such as service offerings, pricing, and customers. All three

offer similar services and pricing, but AWS is a clear leader in customers serving big names such as Netflix, Dow Jones, and Airbnb [9], [10].

We propose using AWS to host both our backend and our database; however, due to the fierce competition between cloud service providers the choice of AWS can change. For our initial development we will ideally use the free tier of Amazon Relational Database Service (RDS) as we are eligible for a free 12-month trial [8].

## Main Challenges & Proposed Solution

The four main challenges with this project is to develop a platform that is efficient, scalable, user-centric design, and effective launching of U-Post at University of Calgary. Additionally, since we are learning many of these development principles as we develop this project, there will be a steep learning curve associated with producing the content we envision.

Mitigation Strategies:

- Efficiency – Due to the scalability challenge, a good resource will be cloud-based servers. To minimize costs our website has to be efficient at querying the cloud servers and maximizing the cloud server advantages.
- Scalability – Develop software that is capable of handling user growth efficiently without crashing.
- User-centric Design – Mimicking successful websites such as YouTube and Netflix in order to create a user experience that is familiar.
- Effective Launching – We are partnering with the Hunter Hub to create an effective launching strategy which utilizes its university network, resources, and event experience. Alongside, a launching campaign will be developed to effectively engage the University of Calgary community.

## Project Plan & Timeline

Date	Details
10-May-2019	Submit Project Proposal
24-May-2019	React, API's, AWS Initial Learnings
31-May-2019	UX design upgrades & API decoupling
7-June-2019	Coding Sprint 1
14-June-2019	Coding Sprint 2
17-June-2019	Midterm Report
28-June-2019	Coding Sprint 3
5-July-2019	Coding Sprint 4
12-July-2019	Coding Sprint 5
19-July-2019	Coding Sprint 6
26-July-2019	Coding Sprint 7
2-Aug-2019	Coding Sprint 8
9-Aug-2019	Coding Sprint 9
15-Aug-2019	Final Report

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