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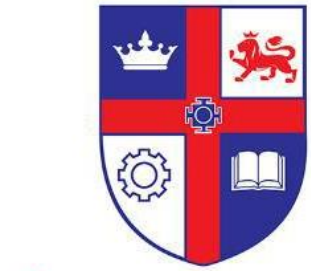

islington college
(इस्लिङ्टन कलेज)

CS6PO5NI, Final Year Project Proposal – 2019/20

Anti-Waste Mobile Application

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OVERVIEW

1. Project Background and Description:

As the world population continues to grow, so does the amount of garbage that people produce. On-the-go lifestyles require easily disposable products, such as soda cans or bottles of water, but the accumulation of these products has led to increasing amounts of plastic pollution around the world. As plastic is composed of major toxic pollutants, it has the potential to cause significant harm to the environment in the form of air, water, and land pollution. Plastics are part of our lives which is quite unfortunate as it is not safe.

On the contrary, 800 million people go to bed hungry every night. That is 1 in 9 people on the planet who are starving or malnourished. (The problem of food waste - OLIO, 2019) With millions of people all over the world struggling to find enough to eat, the fact that millions of tons of food are tossed out every year can be surprising. But it is true. Food waste is a huge problem in developed countries, and it is a serious economic and environmental issue.

Metals & Steels are created and thrown away in large numbers. The environmental ramifications of those two facts are significant. Though metals have been recycled for at least 5000 years, industrialization and urbanization brought dramatic changes to waste generation and waste disposal became a huge problem. (Medina, 2010)

2. Problem Scenario:

Today, the world produces about 300 million metric tonnes of plastics every year and this is a lot of numbers. (Rob Opsomer, 2016) It is still growing every year because we keep producing more new plastics. These plastics wind up negatively affecting wildlife habitat, and humans by affecting lands, oceans, and waterways. Marine plastic litter pollution is already affecting more than 800 marine species through ingestion, entanglement, and habitat change. Current estimates show that at last 8 million pieces of plastic are entering the oceans every single day. With 1 in 3 fish caught for human consumption now containing plastic, the question is no longer are we eating plastic but how bad for us is that. In fact, researchers say that less than 10 percent of our plastics actually get recycled, so all the new plastics we make a lot of it ends up in the wrong place. If we still don't think about plastic. Then, by 2050, the oceans will contain more plastic than fish by weight. (Mwamba, 2018)

Sadly, to say that food waste is one of the biggest problems facing mankind today. Between 33 – 80% of all food produced is never eaten, and the value of this wasted food is worth over $1 trillion. (Problem, 2017) This is not only an economic problem, but it is also an environmental problem. It takes a landmass larger than China to grow the food each year that is ultimately never eaten, land that has been deforested, species that have been driven to extinction, indigenous population that has been moved, soil that has been degraded, all to produce food that we then just thrown away. The food in landfills decomposes and emits methane, a poisonous greenhouse gas. Globally, methane gas from food waste makes up seven percent of total greenhouse emissions. (Problem, 2017)

Metals and Steels have been also a big problem in an environment and to human beings. Scrap metal in the landfill is a wasted resource. It is estimated that we consume about 200 billion of beer and soda can every year. Throwing away a single aluminum can waste energy equivalent to the same can filled with gasoline.

Walk around Kathmandu and you will be amazed by its cultural beauty. Unfortunately, this journey is littered with more than just remarkable artifacts and diverse lifestyles. The city streets are covered with piles of plastics and organic waste alike. Even the sacred Bagmati River is polluted by trash pilling upon rocks and aside from the ritualistic cremation of bodies at UNESCO World Heritage Site, Pashupatinath Temple, an important ceremony for Hindus saying final goodbyes to their loved ones. The current situation in Nepal is unpleasant. It is estimated that between 800 and 1000 tons of plastics are produced in the Kathmandu Valley each day and tons of recyclable waste still ends up in the Landfills every year. (Azoulay, 2)

3. A project as a solution:

One good reason to recycle plastic is that there is just so much of it. Recycling plastic helps reduce landfill space, helps protect animals, decreased pollution, reduced greenhouse gas emissions, and helps conserve natural resources and energy. Although, almost every kind of metal can be recycled again and again without degradation of properties, currently, only 30 percent of metal is recycled. Recycling metals can help save up to 75% of the energy. Air pollution is also reduced by almost 90%. (Leblanc, 2019) Food waste is composed of organic matter which can be used for composting to make fertilizer. It is an effective and eco-friendly way of disposing of food waste. By using leftovers and other food waste, we can convert these smelly items into a highly organic product rich in nutrients that we can use to grow vegetables or flowers with it.

I have decided to create a mobile application that allows the user to sell their household waste which are plastic, metal, and organic waste. We provide three kinds of the dustbin to the user who wants to sell their waste – green for organic waste, red for plastic, and blue for metals and steels. A mobile application also helps users to find and purchase plastic and metal products that are recycled and reused.

4. Aims and Objectives:

The main goal of this project is to solve environmental problems with the power of technology. The project primarily focused on developing a mobile application for people to manage and recycle waste. One can easily sale their waste through a mobile application and get paid.

Objectives of this project are pointed out below:

a) Try to solve the global environmental problem with the power of technology.
b) To make the waste management system process more efficient.
c) To do the right thing for the customers, reduce their waste and help them to earn money out of trash, and save their time, and help them meet sustainable goals by keeping more trash out of landfills and oceans.
d) To create a more efficient and effective society.

5. Expected Outcomes and Deliverables:

The mobile application helps customers to reduce their wastes which include plastic, metal & steel waste, and organic waste by selling them to us. We provide three kinds of the dustbin to the user who wants to sell their waste – green for organic waste, red for plastic, and blue for metals and steels. A mobile application also helps users to find and purchase plastic and metal products that are recycled and reused. Customers can sell and buy their items directly from the mobile app or with cash. Admin can add product list and view recent order list from web application where clients or customers can view the product list from mobile. The customers also can place an order of the products where the delivery of products can be performed.

The mobile application allows users to create their individual profiles. Users can see their timeline and history and can get reward points. Users can also share their timeline on Facebook which helps other people to watch their stories and get inspire. Users can also check their waste collection date and get notify of their collection days. The collection schedule and reminders are sent from web applications. Admin gets the customer's location and time to get there from the web when it's time to deliver recycled products. Users can also read articles and blogs related to recycling or waste management.

6. Project Risks, Threats and Contingency Plans:

The risk is that the project might face is it will be accessible to the only fewer community as the mobile app is developed in a single platform. Because, for instance, suppose I build an android app for the users, but after I launch my mobile application, other customers are using iOS phones. It won't only affect customers but also limit the company's future options. To overcome this risk, I will develop my mobile application using a framework called react-native. It helps to develop mobile applications for Android, iOS, Web, and UWP by enabling developers to use React along with native platform capabilities.

Another risk that the project might face is that if the push notification doesn't work or might encounter difficulty in delivering a push notification to the customers. To solve these kinds of problems, email service will be integrated.

Another risk that the project might face is to notify the customers of different locations. If automated notification sent to different locations, it will be difficult to pick up the waste. To overcome this risk, the system pre-registers the customer's information based on the customer's location with a pickup time. When it's time to pick up the waste the system will automatically send the notification.

7. Methodology:

In order to achieve the expected outcome, the methodology to be used in this project is the Agile Kanban methodology. The agile methodology is an incremental and iterative mobile application development approach, where the complete app development process is divided into multiple sub-modules, considered as mini-projects. (Contributor, 2019)

I've chosen the Agile Kanban methodology because, in the case of the agile development model, the complete mobile app project is divided into smaller modules that are treated like independent sub-projects. Kanban doesn't come with the size limitations whereas scrum recommends the development team to have at least 3 to 9 members. This methodology fosters testing of every single module at the primitive level. This reduces the risk of encountering a bug at the time of quality testing of the complete project.

8. Resource Requirements:

1. Basic Hardware requirements:
    a) PCs with 8gb RAM and 2 core CPU with macOS
    b) Mobile Device (Android and IOS device both)
2. Software Requirements (Backend):
    a) Laravel
    b) MySQL (database)
3. Software Requirements (Mobile App):
    a) React Native
    b) Expo
    c) Expo Push Notifications
    d) React Native Redux persist for state management and persistency
    e) Axios to make a request to an API
    f) Jest for mobile app testing
4. UX/UI Design:
    a) Adobe XD
5. Research and Development:
    a) Tuts+
    b) Inspired UI
    c) UXPin and UXCam

9. Work breakdown structure:

Activity	Duration	Description
1. Project Planning	≈ 15 days	**a.** Research on similar projects **b.** Requirement gathering **c.** Proposal making
2. Web application designing	≈ one week	Wireframe and mockup designing (changes and adjustment)
3. Mobile application designing	≈ two weeks	**a.** Color choice (color palette, changes, and adjustment) **b.** A preliminary study (flow study on similar apps) **c.** Wireframe designing **d.** Design app screens and clickable prototype
4. Web application development (Back-end & front-end)	≈ two months	**Front-end:** **a.** Preliminary study and research **b.** Templating and Coding sites **Back-end:** **a.** Preliminary study and research **b.** Software architecture and designing **c.** Database design **d.** Authentication (User login) **e.** Module crud operation **f.** API development **g.** Dashboard and Notification setup **h.** Google maps integration **i.** Upload product list
5. Mobile application development (both iOS & Android)	≈ three and a half months	**a.** Preliminary study and research **b.** Software architecture and designing **c.** Development environment setup **d.** Make a request to Web API **Coding** **a.** Sign up or register user **b.** Authentication (User login) **c.** Dashboard setup **d.** E-commerce setup **e.** User Profile setup **f.** Check collection date and set reminders **g.** Timeline and history

		h. Waste related articles and blog setup
6. QA and Testing	≈ one week	**Testing web application and maintenance** **a.** Unit tests – test an individual unit of code (function/class/method) **b.** Integration/Service tests – Test the integration of multiple pieces of code working together, independent of UI **c.** UI/End-to-end tests – Test a feature thoroughly including the UI. **Testing mobile application with Jest, and maintenance:** **a.** Unit tests – test an individual unit of code (function/class/method) **b.** Integration/Service tests – Test the integration of multiple pieces of code working together, independent of UI **c.** UI/End-to-end tests – Test a feature thoroughly including the UI.
7. Project Documentation	≈ one and a half month	Project documentation according to agile scrum methodology

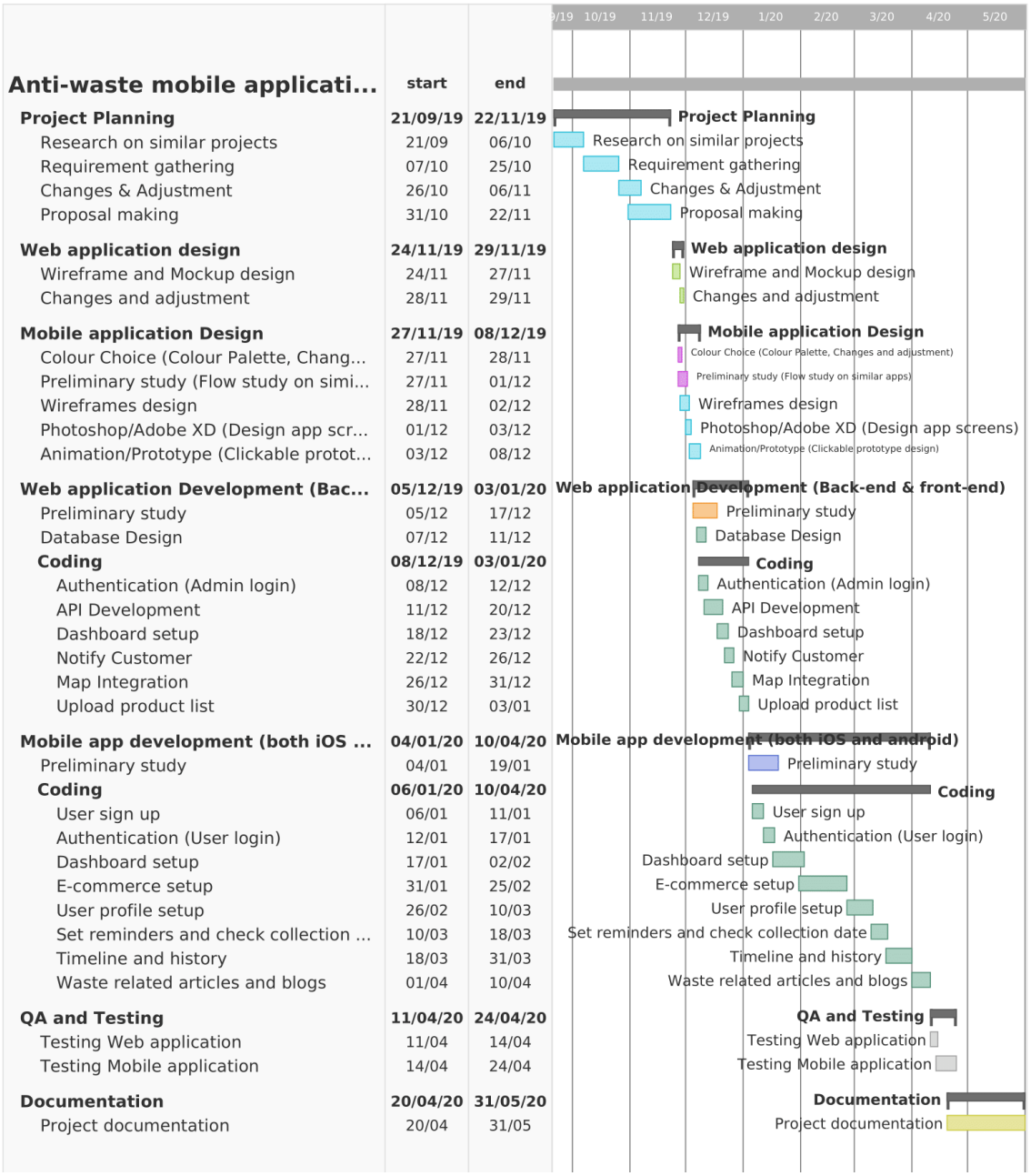
10. Milestones:

Below shows the appropriate milestones with the duration of the mobile application project.

1. **Designing or Prototyping the web application:** making wireframes. ≈ one week
2. **Designing or Prototyping the mobile application:** Color choice, making wireframes, design mobile app screens, making a clickable prototype design. - ≈ two weeks
3. **Web application development (Back-end & front-end):** a preliminary study, research, coding. ≈ two months
4. **Mobile application development (both iOS & Android):** a preliminary study, research, coding. ≈ three and a half months
5. **QA and Testing:** testing web application, testing mobile application. ≈ one week
6. **Documentation and Report:** project documentation. ≈ one and a half month

11. Project Gantt chart:

Here, shows the Gantt chart for the mobile application project.



12. Conclusion:

In this project, mobile technologies will be studied and used in conceptually designing a system solution to waste collection which is an important step in waste management. The main goal of this project is to solve environmental problems with the power of technology and to make the waste management system process more efficient.

In creating the system, an agile kanban methodology will be used; where individual problems will be solved using modules that are then integrated together. This system can be commercialized and could be very helpful in developing countries and will create a more efficient and effective society.

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