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## Chapter 1 – Introduction

Under “Human Computer Interaction” module the aim of this coursework is to design an interactive mobile or web user interface and prototype design for an Agricultural Information System, with the application of theoretical concepts learned and knowledge gathered from the module throughout the semester. This coursework is a test of students’ abilities to balance creativity and usability, implementation of planned functionalities based on the scope of the project and ability to target expected users through the design, while working as a team.

### 1.1 Introduction to Project

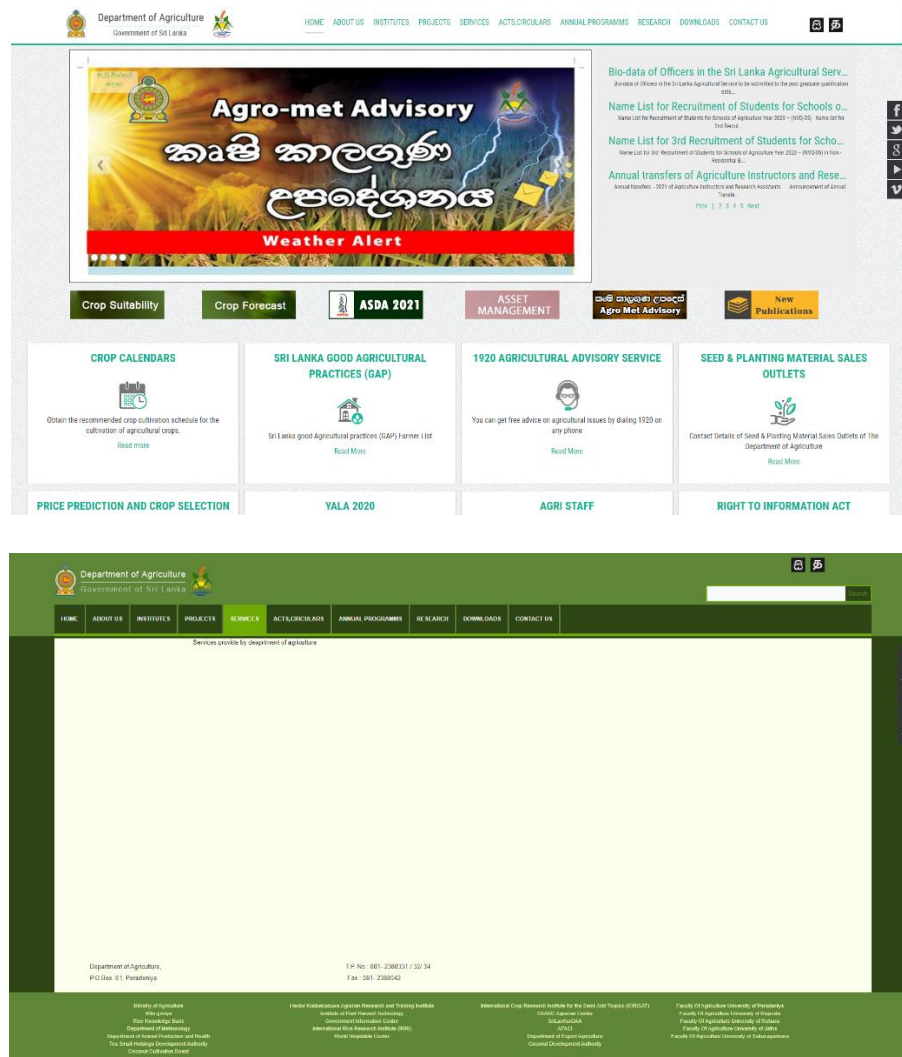
This report contains a detailed documentation of a Website User Interface and Prototype Design for an Agricultural Information System. By referring to The Department of Agriculture (DOA) website and many other leading agricultural websites based on Sri Lanka and beyond, we were able to gather and sort out the best functionalities and techniques used on them and create a very appealing and a user-friendly website prototype for an agriculture information system.

As a team we mainly focused on simplicity and user experience of the design. With research we were able to identify the targeted users, and to build a design that can deliver information and core message of the website directly to them without any effort. Furthermore, we managed a consistent and a simple design flow throughout the design, so that the user may not be overwhelmed by the website design.

## 1.2 Problem Statement

As the main agricultural information system available in Sri Lanka, the website of Department of Agriculture (DOA) has a lot of noticeable problems and flows. The overall visual design of the website is outdated and poorly designed. It is noticeably slow compared to many modern websites, and the quality of the images and graphics used are very poor. Another noticeable issue with website is the poor and confusing user journey. It is not very easy to find what the user wants to, in the DOA website.

Furthermore, we noticed that the website itself contains two different design templates within the same website. As for an example, if you click on the services section, the theme of the whole site changes, and what is even worse is that the services page is empty.



<https://www.doa.gov.lk/index.php/en/>

## Chapter 2 – PACT Analysis

PACT Analysis is a structural method used to analyse and identify whom, what and where a user interacts with a user interface in human computer interaction. The aspects analysed in this method are People, Activities, Contexts and Technologies.

### 2.1 People

We have identified various types of potential users through research, that are expected to interact with our website. Below is an in-depth analysis of each potential user.

#### **Farmers:**

We have identified farmers as the most expected to visit potential users for our website. Over 60% of the potential users are expected to be farmers. The age range of the expected farmers to visit the site is between 18 – 70 years.

Expansion of internet coverage in rural areas has been prioritized by internet connection providers such as Dialog, and research show an increased access to internet by farmers.

Farmers who will visit our site, are expected mainly to look for complete details and related information on crops, pest control, agricultural technologies, and sales related guidance.

#### **Researchers:**

We have identified researchers as one of the potential users for our website. The age range of the researchers has been identified as 18 – 60 years. They are mainly expected to look for news/articles on agricultural development, history, or technologies. They are also expected to post articles on to the blog regarding their research.

#### **Scientists:**

We have identified scientists to be one of the potential users for our website. The age range of the scientists expected to visit the site has been identified as 30 – 60 years. They are mainly expected to share their knowledge and ideas with the community through the site's blog page. They are also to be expected to look for opportunities to work with the company. So, they are expected to interact with 'Projects' section and take action on 'Contact Us' section.

**Innovators:**

Innovators are also a group we have identified as potential users. Years 15 – 40 has been identified as the age range of the innovators expected to visit our site. They are expected to get information on newest technologies and share their innovative ideas and achievements through the blog section. They are also to be expected to seek guidance and support from us through the website, for their innovations.

**Foreigners:**

We have identified foreigners as one of the types of potential users for our website. They are expected to seek information on Sri Lanka's agricultural state and development through our site.

**Students:**

We have identified students as a minor group of potential users who would visit our website. They are expected to look for information and knowledge regarding agricultural education. The ages of students expected to visit are 10 – 28 years.

## 2.2 Activities

We have identified characteristics of activities that are expected from our website that can be both simple and complex. Below is an in-depth analysis of each identified activity.

### 1. Regularity Activities (Activities done daily, monthly, or annually)

#### **Search for information:**

The main regular activity done by this information system is to provide information related to agriculture field and technology.

#### **Read articles and blogs:**

Articles and blog posts available on the website can be expected to read and referred regularly.

#### **Sign in and Sign up:**

Users can register and use their accounts to contact us and get assistance on agriculture related matters and they can use their accounts to directly post their articles into the blog.

### 2. Response time related activities

#### **Navigating through pages:**

Navigation through the pages should be fast and smooth in order to avoid user being unhappy with user experience.

#### **Contact and Support:**

Users who are trying to contact or seek support from us should be addressed as soon as possible for them to have a greater experience with the developed system.

#### **Blog posting:**

The articles submitted by users should be reviewed and make them available on the blog page in a reasonable time.

## 2.3 Context

This web page is not intended solely for personal use. Anyone has access to this website. The website is not limited to people of a certain age. As a result, none of the operations will suffer because of the organizational background.

## 2.4 Technologies


Below are the technologies we used to design the website interfaces and prototype.

- Adobe XD
- Adobe Photoshop



## Chapter 3 – User Profiles

### Jagath Perera (Organic Farmer)



"I love agricultural advancements because it helps my company"

**Age:** 36  
**Work:** Owner of JP Organics  
**Family:** Married, 2 kids.  
**Location:** Nuwaraeliya

#### Needs

- To track sales for independent items.
- To leverage technology to help him make informed decisions.
- To manage his inventories across different farmers' markets.

#### Frustrations

- Records that are not organized by product.
- High fees from payment tracking services.
- Lack of cross-vendor data to gauge how well farmers markets are doing overall.

#### Bio

Jagath is the owner of JP Organics, a local farming collective that grows fresh produce.

Jagath sells his produce at a number of markets, using detailed customer analytics and records to track his selling rates and progress.

He uses the newest technologies on his farm to improve his business furthermore.

#### Motivation

Incentive	80%
Fear	20%
Growth	70%
Power	40%
Social	80%


#### Skills

Technology	60%
Payment tracking	90%
Customer engagement	85%
Inventory management	50%

#### Personality

Introvert	10%	Extrovert
Thinking	20%	Feeling
Sensing	10%	Intuition
Judging	10%	Perceiving

### Athula Perera (Agricultural Researcher)



"I love agricultural research because my research can help farmers"

**Age:** 27  
**Work:** University Researcher  
**Family:** Single  
**Location:** Colombo

#### Needs

- Easy discovery of news and updates.
- News and updates of agriculture and technology.
- Comment and share news.

#### Frustrations

- Records that are not organized by product.
- High fees from payment tracking services.
- Lack of cross-vendor data to gauge how well farmers markets are doing overall.

#### Bio

Athula is an agricultural researcher who is assigned to a university research team.

Athula research on various kinds of crops in different areas, and their success rates according to areas.

He uses his research to help his team, and he publishes his research data online so that farmers can use the information.

#### Motivation

Incentive	60%
Fear	30%
Growth	70%
Power	40%
Social	60%

#### Skills

Technology	80%
Payment tracking	50%
Customer engagement	70%
Inventory management	40%

#### Personality

Introvert	10%	Extrovert
Thinking	20%	Feeling
Sensing	10%	Intuition
Judging	10%	Perceiving

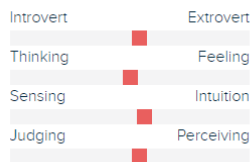
## Akila Perera (Scientist)



"I love science because science helps humans"

**Age:** 32  
**Work:** Scientist at CRI  
**Family:** Married, 1 kid  
**Location:** Chilaw

### Personality



### Needs

- Easy discovery of agriculture-related updates.
- News and updates of agriculture and technology.
- Comment and share news.



### Frustrations

- Records that are not organized by product.
- High fees from payment tracking services.
- lack of cross-vendor data to gauge how well farmers markets are doing overall.



### Bio

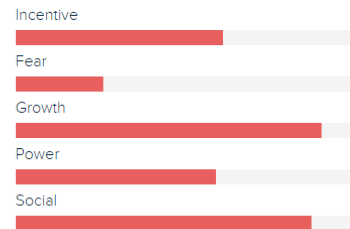
Akila is a scientist at Coconut Research Institute.

Akila leads researches on various kinds of coconut types in different areas and regions.

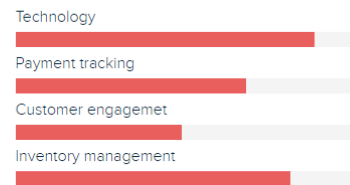
He uses his education and scientific knowledge to find answers regarding coconut-related plant matters.



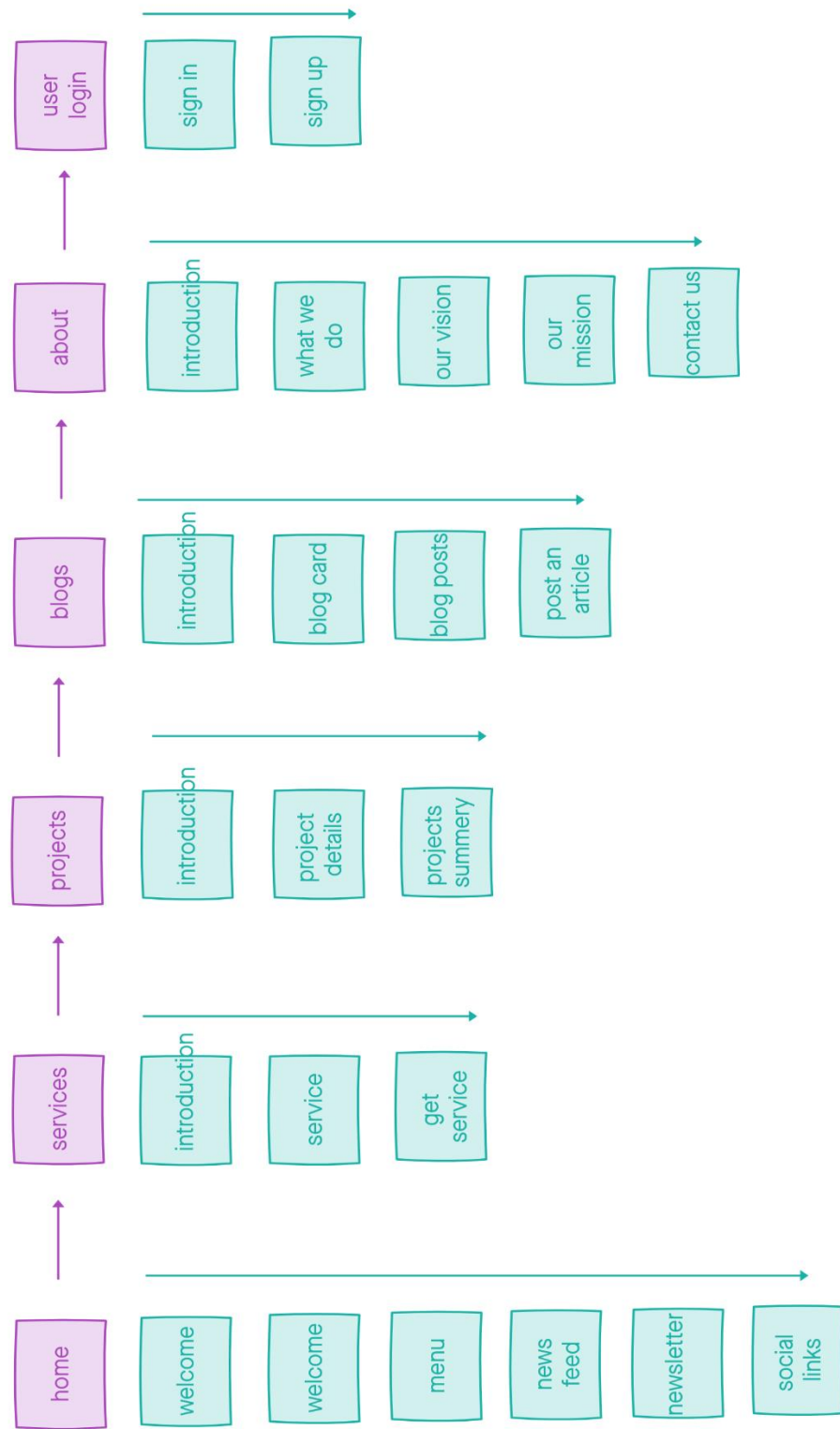
### Motivation



### Skills



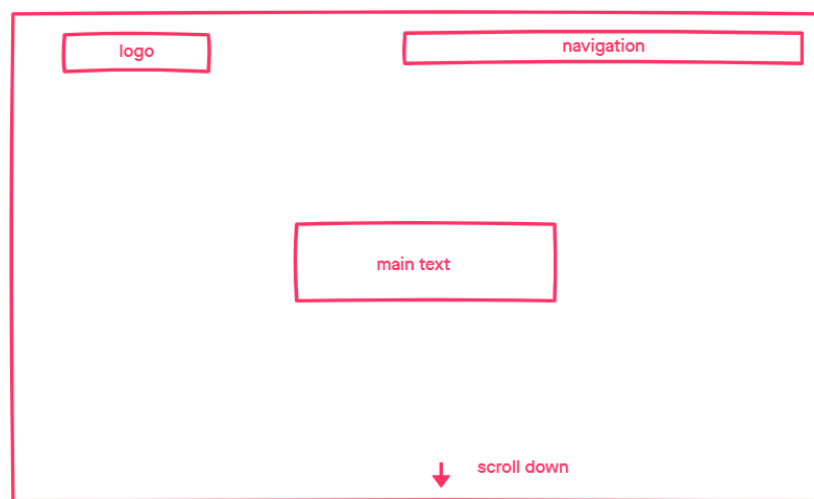
## Chapter 4 – Task Analysis Diagrams



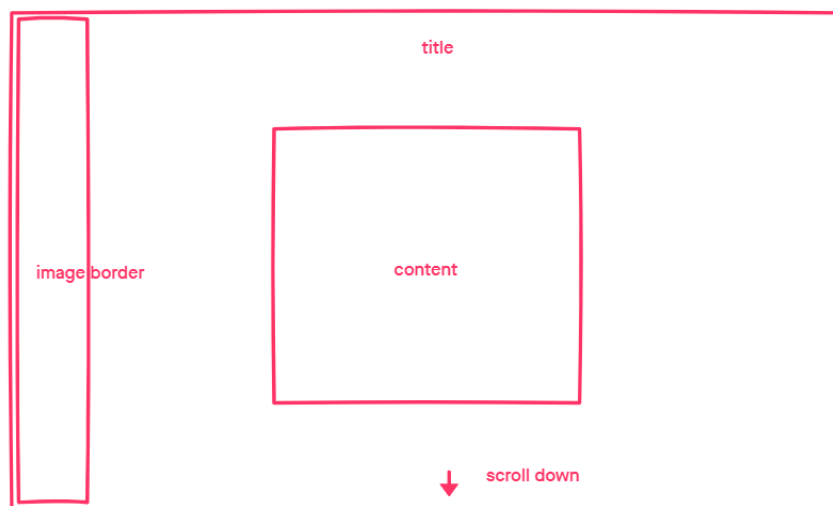
## Chapter 5 – Lo-Fidelity Prototypes

Lo-fidelity prototypes are sketches that will demonstrate the overall design model and flow. These are made before start designing high-level designs and the final user interfaces. Without starting to design user interfaces straightaway, drawing lo-fidelity prototypes is the easiest and quickest way to translate idea into high-level designs.

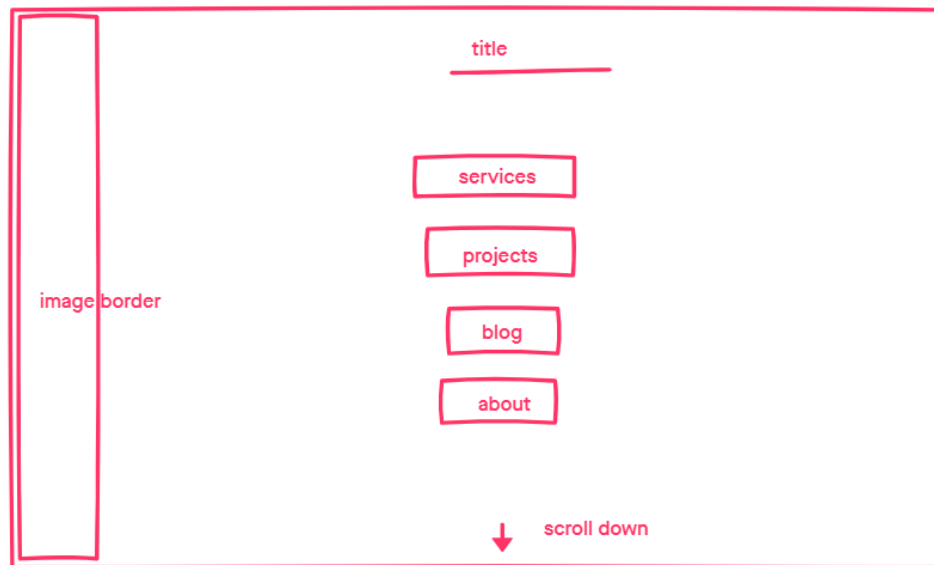
### 1. Landing page



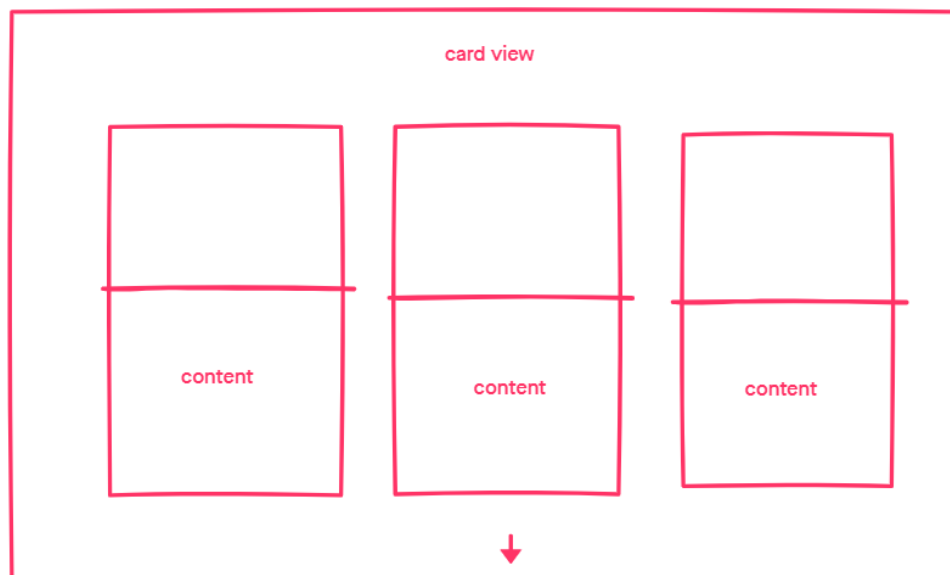
### 2. Content format (universal)



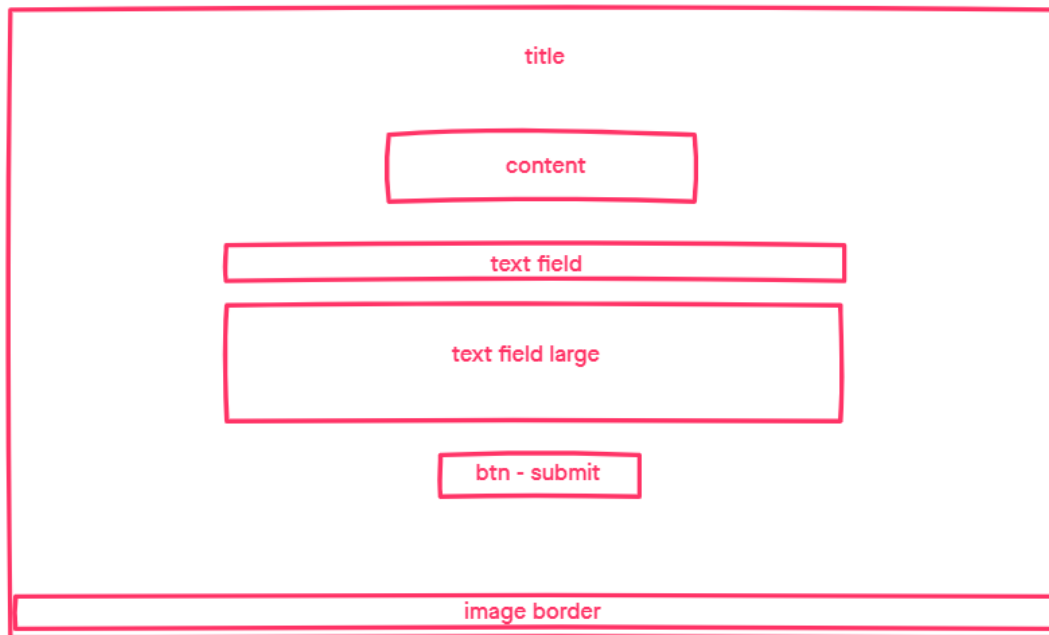
### 3. Menu (homepage – scroll down)



### 4. Card view



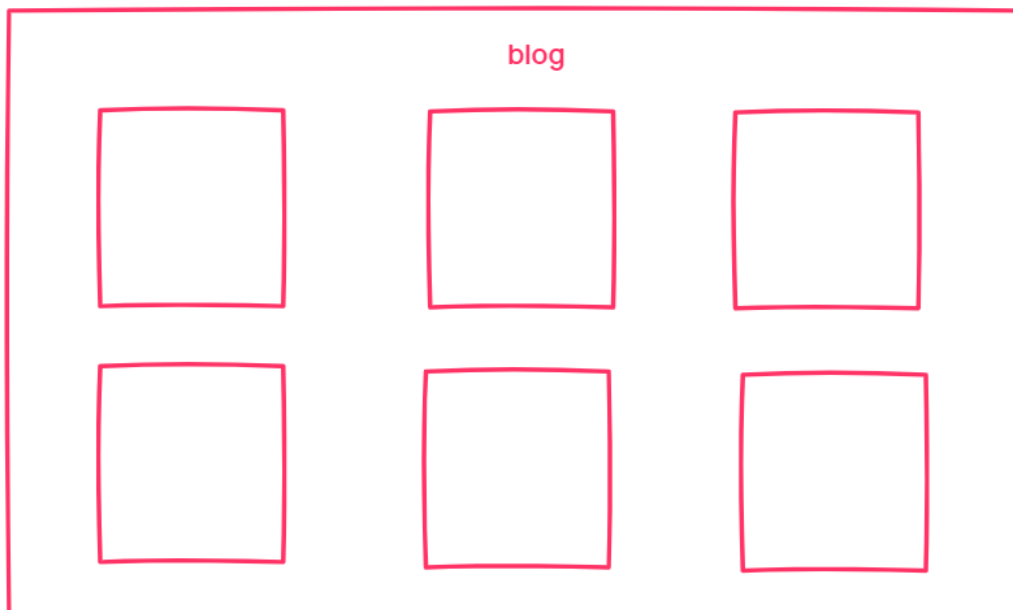
## 5. Form / Submission



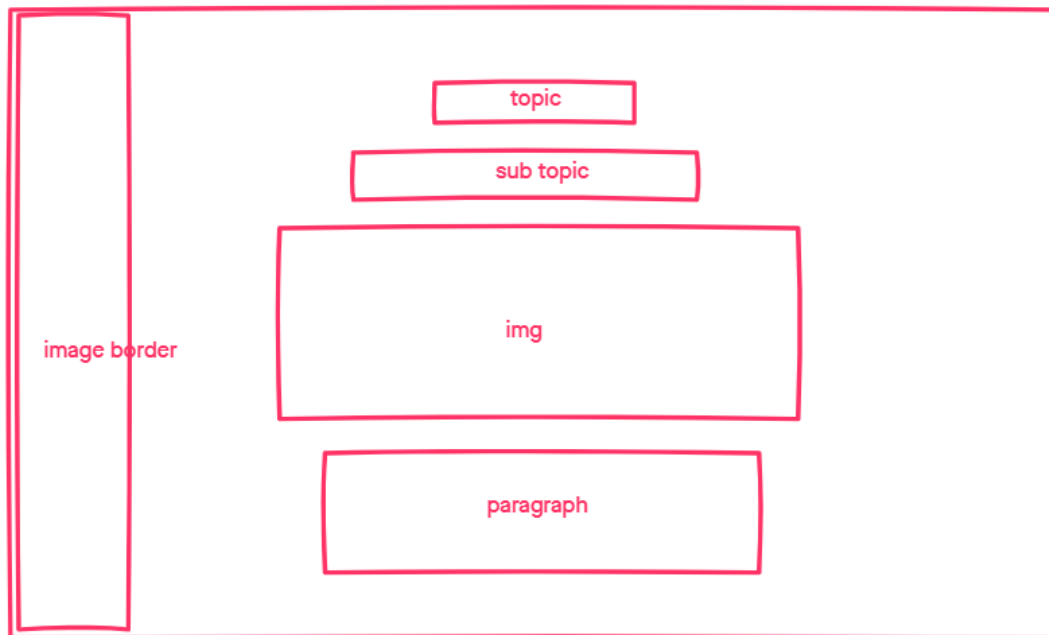
A diagram of a form layout within a rectangular container. The layout consists of the following elements from top to bottom:

- A label "title" centered above a rounded rectangular input field labeled "content".
- A horizontal rectangular input field labeled "text field".
- A larger horizontal rectangular input field labeled "text field large".
- A rectangular button labeled "btn - submit".
- A thin horizontal rectangular border at the bottom of the container labeled "image border".

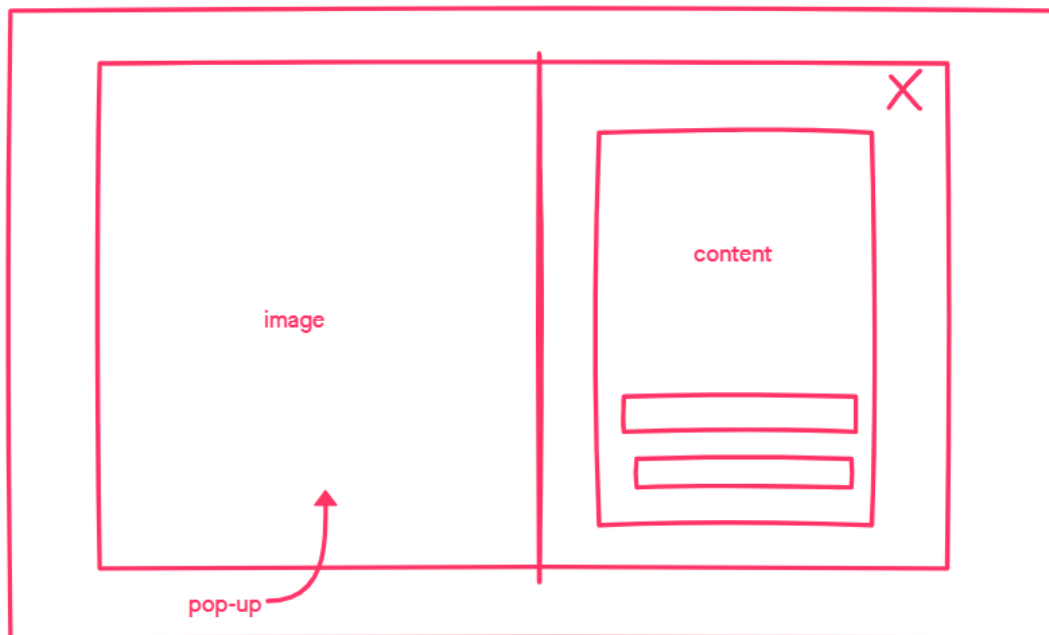
## 6. Blog section view



## 7. Article view



## 8. Sign in / Sign up



## Chapter 6 – Design Principals Used and justification

The user interface is the bridge that connects humans with computers to get the desired output. Also in program development process, interfaces work as a platform that makes clients and developers understand each other. Rather than starting to develop an application or a website just by hearing to client's needs, going through an interface and interaction will save both client's and developer's time and will always result in a better product outcome. When designing such interfaces there are HCI principles designers should follow, to provide a better product. There are 3 main types of design principles.

- Schneiderman's eight principles of HCI
- Norman's seven principles
- Nielsen's ten heuristics

In this coursework we have designed multiple interfaces, and we have designed all of them considering the above-mentioned principles. For an example, as mentioned in Schneiderman's eight principles, "strive for consistency" we have used a consistent location for all menus and screens across the website. We have also applied this rule for the graphical elements such as fonts, colors, images, and shapes.

"Offer informative feedback" is also another principle we used in our design. This rule indicates that the interfaces should be both communicative and must direct the user in a meaningful user journey in the task they are involved. In our website, there are several forms that the user can submit and when a user is in the form page, all the indications for him to enter his name, his message and the submit button are clearly designed and indicated.

In our design progress we used many other different design techniques and principles and it helped us to maintain a simple, creative, and user-friendly design throughout the design.



## Chapter 7 – Prototype Designs

### 7.1 Technical Specifications

Under “Human Computer Interaction” module the aim of this coursework is to design an interactive mobile or web user interface and prototype design for an Agricultural Information System, with the application of theoretical concepts learned and knowledge gathered from the module throughout the semester.

For this project, the main tool we used is Adobe XD and for graphical design purposes we used Adobe Photoshop accordingly. In interface design even though there are many experience design tools available, only few has become effective and popular at the same time. Adobe XD is one of them, and Adobe is a well-recognized product in the design industry. Also most of our group members had work with Adobe XD, so we decided to use it for our project.

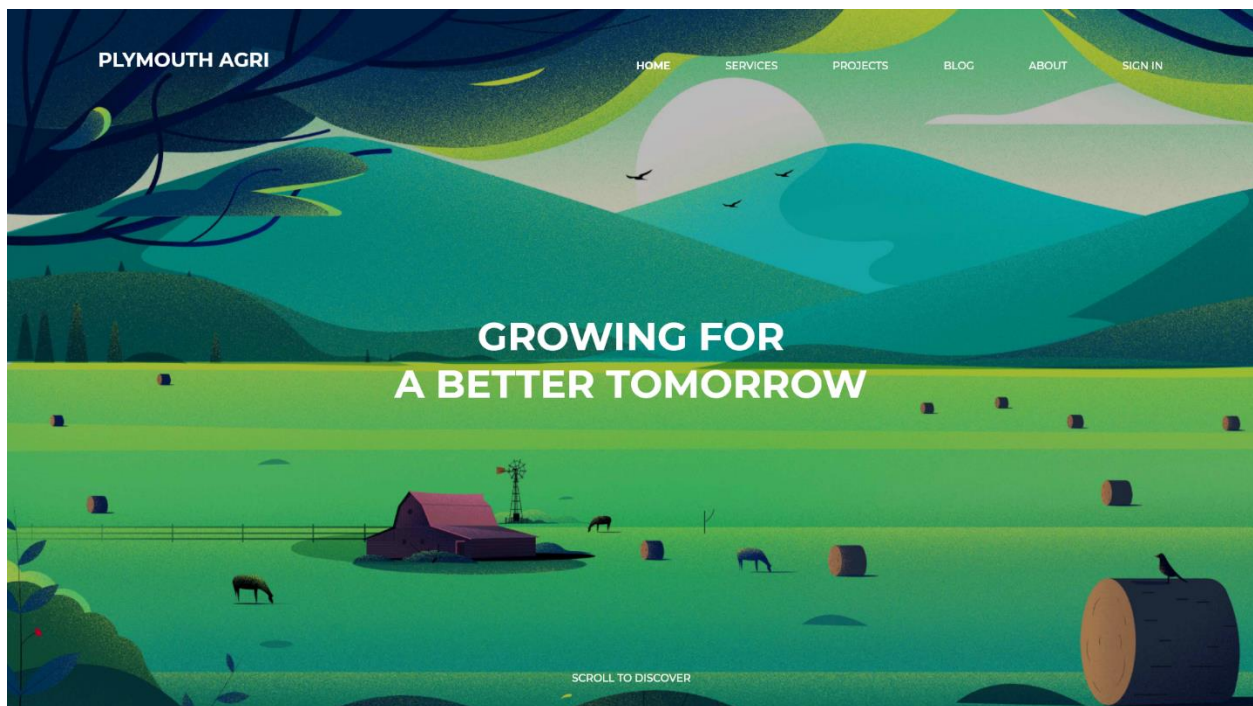
In addition to that, we used sources such as Dribbble and Unsplashd to get illustrations and images for our designs and we used a tool called In-Vision for flow design and to draw Low Fidelity prototypes.

## 7.2 Screen Designs with Descriptions

### 1. Landing page

In a website the Landing page act as a greeting or a reception for the users. The landing page represents the whole website and its personality. So, we took a great time working on it to make it look beautiful, but simple.

We have added the logo of the company is on the upper left corner, and a simple navigation bar on the upper right corner perfectly aligned with the logo. In the centre is a bold two lined sentence that indicates the whole idea of the company and, in the background, we have added a beautiful illustration of a farm.



## 2. Home page (Scroll down)

We designed the home page with multiple sections, and when user scrolls down, sections will be revealed one by one.

After the landing page is the welcome section, which contains a welcome message. Below it is a menu that the user can navigate to different sections of the web page. If the user decides to continue scrolling there will be a news feed section, that will feature the 3 most recent blog posts from the blog page.

Under it is a section that contains a newsletter subscription form. Below it is the section which features mainly the Instagram feed of the company and other social links.

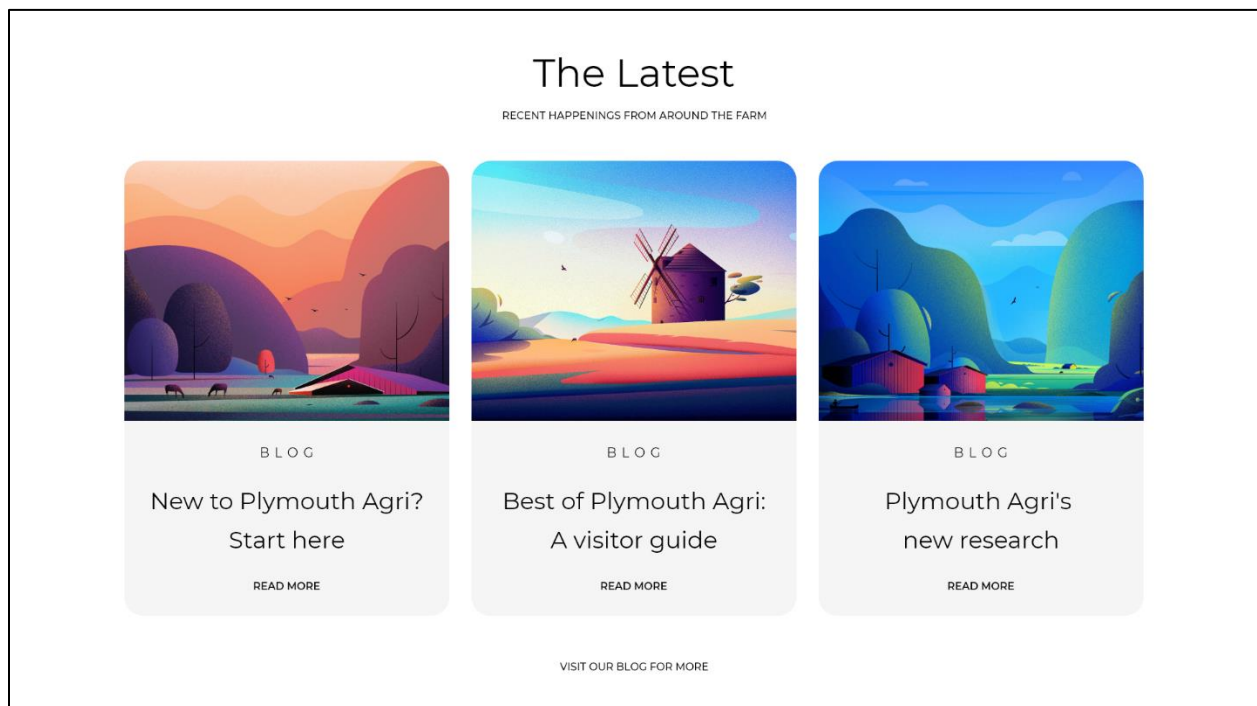
welcome section:



Navigation menu section:



News feed section:




Newsletter:

## Newsletter

### Join Us

JOIN THE PLYMOUTH NEWSLETTER & STAY IN THE LOOP ON ALL  
THE EXCITING HAPPENINGS HERE ON THE FARM


GET UPDATES



Instagram feed and social links:

## #PLYMOUTHAGRI

FOLLOW @PLYMOUTHAGRI ON INSTAGRAM



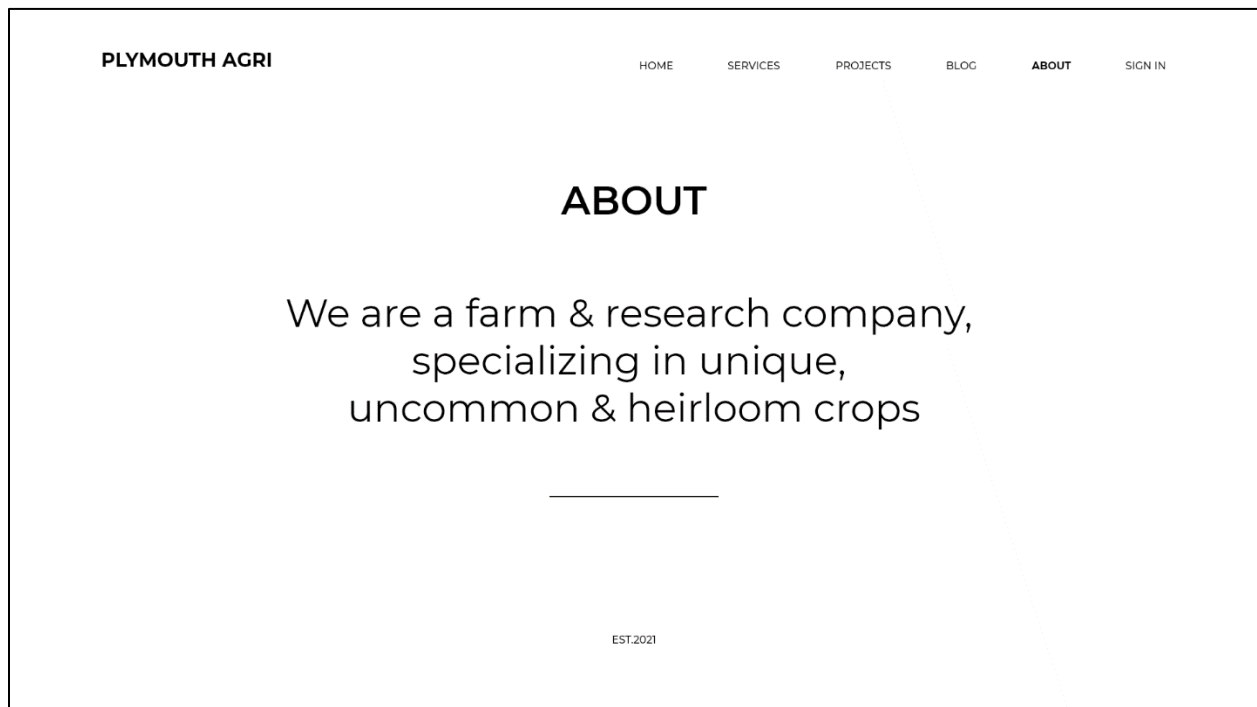


HAVE A QUESTION? BE SURE TO VISIT OUR **FREQUENTLY ASKED QUESTIONS** PAGE.

### 3. About Us

The about us section is also designed in the same theme as above. When clicking on the about button, on the navigation bar or the menu in the homepage, user will be guided to the about section.

In this section user will see as “About” on the top very clearly, and below it is a simple sentence that explains about the company shortly but on point.



The user can scroll down from here, and the sections “what we do”, “our vision”, and “our mission” sections will be revealed to the user one by one.

And finally at the bottom of this page is a “contact us” section where the user can provide feed back or ask a question through the provided form. The links to company’s social are also available below it.

What we do section:



ABOUT PLYMOUTH AGRI

### WHAT WE DO

Encourage individual responsibility and opportunity.  
Treat complacency as a disease and continually  
work to better our company and ourselves.  
Create an environment that enables our people to have  
balanced and productive lives.  
Focus our mindset and activities  
toward helping our clients and their customers  
grow their businesses.

Our vision:




ABOUT PLYMOUTH AGRI

### OUR VISION

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accumsan sed ex eget pulvinar. Nunc mi odio, bibendum quis euismod id,  
tempor at sem. Ut nec tortor commodo, vestibulum nunc et, auctor urna.  
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## Our Mission:



ABOUT PLYMOUTH AGRI

OUR MISSION




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## Contact us:

Contact Us

FEEL FREE TO LEAVE A MESSAGE, FEED BACK OR  
TO ASK A QUESTION

SEND

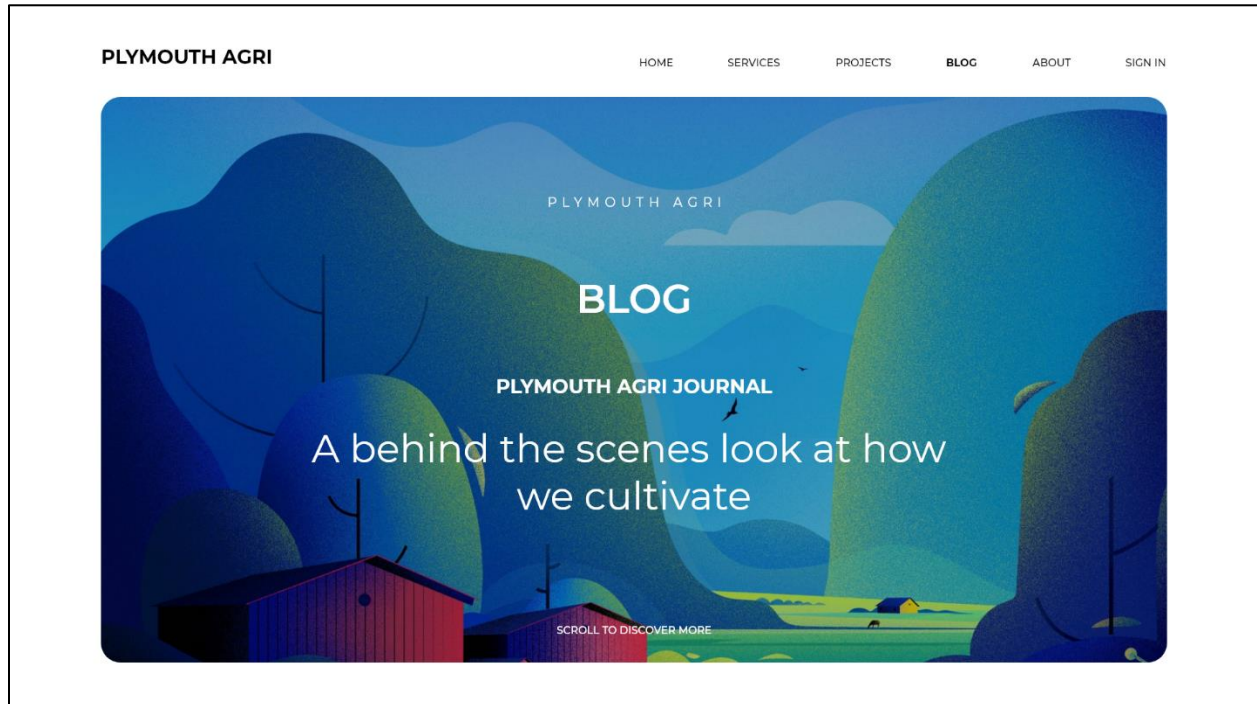






#### 4. Blog

The blog page is a bit differently designed than the other screens. It contains the latest blog post as a huge card on the top, and when scrolling other blog posts will be revealed. The other posts are designed in card style.

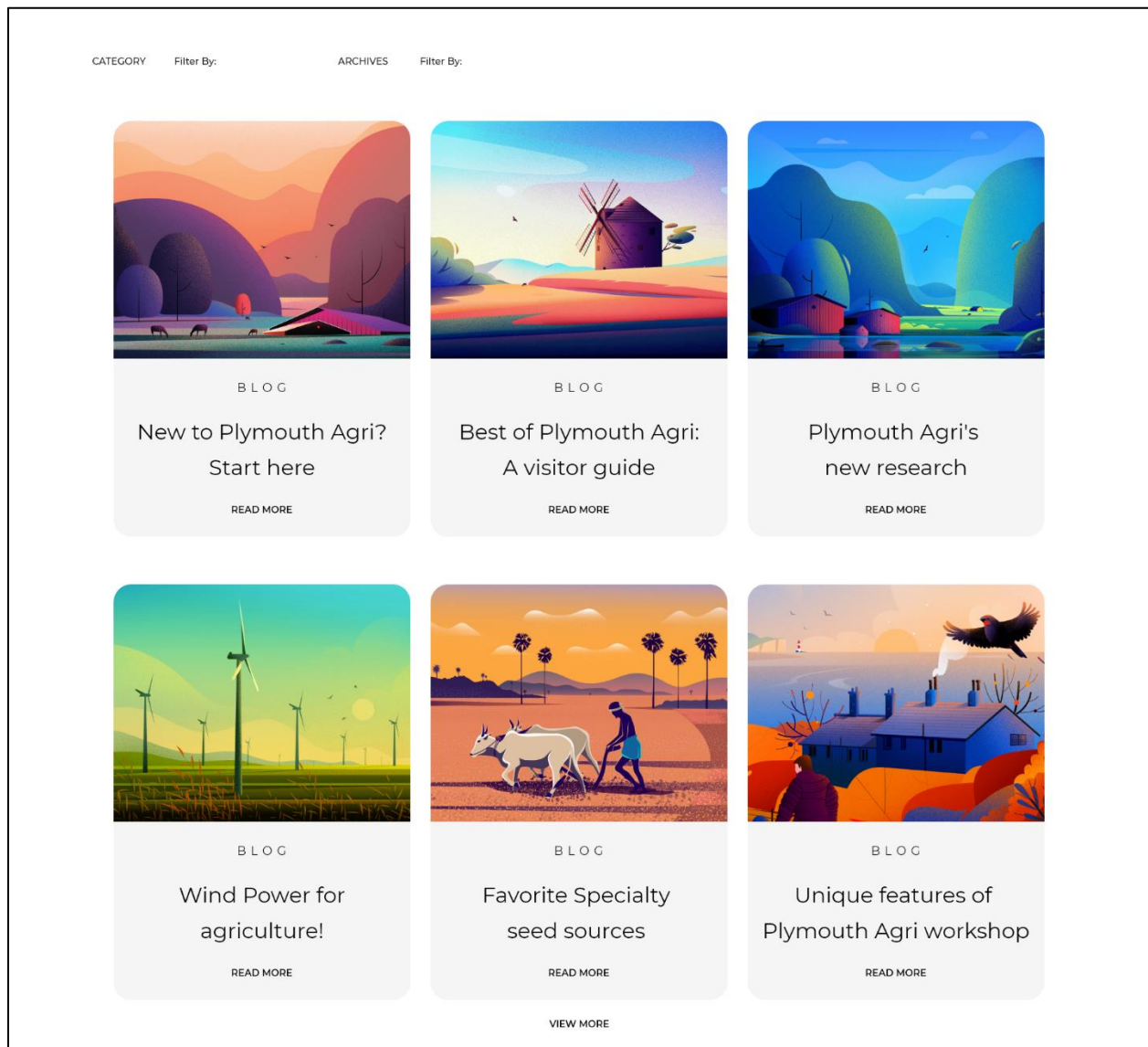


Submit a Blog:

A form titled 'Contribute to Our Blog' for submitting an article. The form includes three input fields: 'First Name', 'Email', and 'Article'. Below these fields is a 'SUBMIT' button. The form is set against a background of a green field with a person and a cow in the distance.

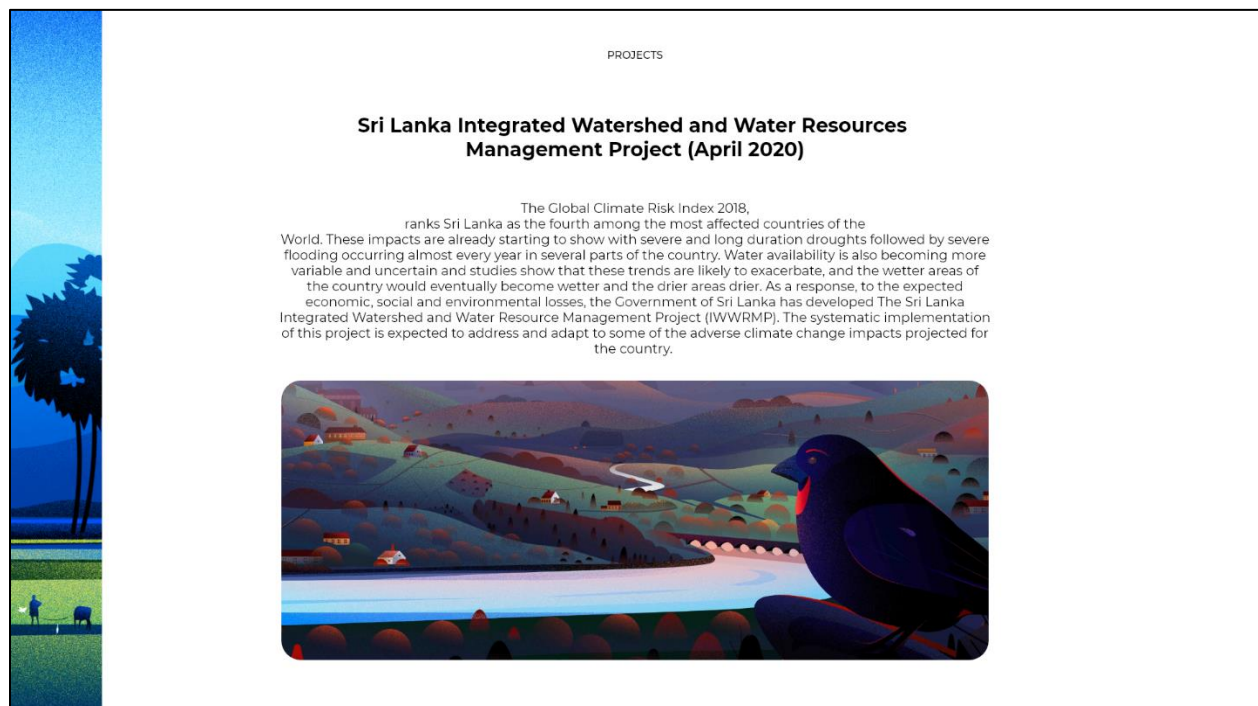
## Blog posts view:

The blog page is a bit differently designed than the other screens. It contains the latest blog post as a huge card on the top, and when scrolling other blog posts will be revealed. The other posts are designed in card style.



## 5. Projects

The projects page contains short articles on company's current projects. It is also designed in the same theme as other screens. When clicking on the projects button, user will be guided to the about section. An article contains its title, a short description, an illustration that indicates the project and a paragraph which describes the project and it's details.



PROJECTS

### Climate Smart Irrigated Agriculture Project (2018-2024)

The Project Development Objective is to improve climate resilience of farming communities and productivity of irrigated agriculture in selected climatically vulnerable Hot-Spot Areas in Sri Lanka. This objective will be achieved through increased adaptation of climate-resilient agricultural practices and technologies, improved agricultural productivity, and increased access to markets in targeted smallholder farming communities. The project design is structured along four components:



PROJECTS

### Supplementary Food Crop Promotion Program

Agriculture has to play a major role in the economy of the country while more attention is being paid on the cultivation of supplementary food crops. Accordingly the Ministry of Agriculture is implementing this programme island wide with the objective of achieving self sufficiency in supplementary food crops by 2016. In consideration of enormous expenditure to be incurred annually on the import of supplementary food crops to meet the local requirement, cultivation of the same locally is much helpful to boost the economy of the country.





PROJECTS

### Accelerated other Field Crop Production Programme

Objectives:

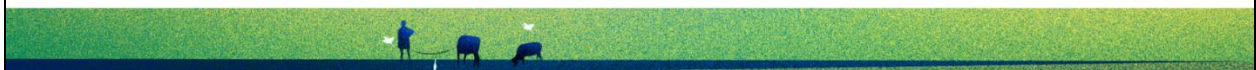
- Making the Country self – sufficient in supplementary Food Crop production
- Achieve higher production in Yala season
- Promote 3rd Season cultivation
- Production of Quality and improved seeds to meet local demand



At the bottom of this page contains a summery of all the active projects of the company.

## Active Projects Summary

1. Sri Lanka Integrated Watershed and Water Resources Management Project (April 2020)
2. Climate Smart Irrigated Agriculture Project (2018-2024)
3. Supplementary food crop promotion programme
4. Accelerated other Field Crop Production Programme

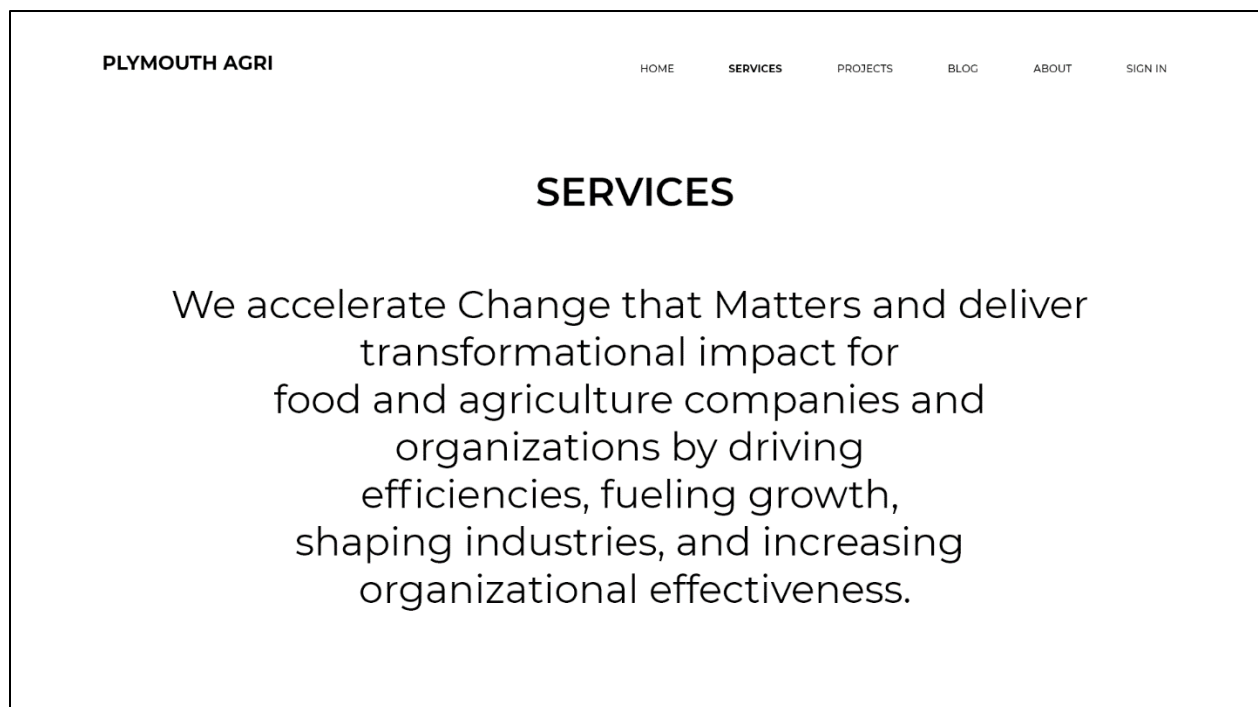


## 6. Services

The services page contains short articles on services done and available at the company. It is also designed in the same theme as other screens.

When clicking on the services button, user will be guided to the services section. An article contains its title, a short description, an illustration that indicates the service and a paragraph which describes the service and its details.

At the bottom of this page contains a form that the user can submit including details of services or guidance they want from the company.



SERVICES

### Agriculture Development & Food Security

We help to improve agri-food systems around the country by bringing innovative thinking, multi-disciplinary expertise, a nuanced understanding of the private sector, and world-class analytics.



About three-quarters of the world's impoverished population depends on agriculture for a living, and low-income families on every continent struggle with accessing nutritious food. Our commitment to fighting against hunger, poverty, and malnutrition can be seen in our support for government, companies, donors, development banks, and civil society tackling complex challenges.

SERVICES

### Agricultural Marketing and Sales Consultancy

We help farmers to achieve commercial excellence through go-to-market strategy, pricing optimization, and sales execution.



The agriculture industry is facing significant disruption, driven by macroeconomic, grower, and competitive pressures. Feeding an expected global population of 9 billion people in 2050 will require the industry to grow significantly while balancing resource pressure and increasing price volatility. We help clients address these pressing issues by identifying growth opportunities and working with them to achieve commercial excellence through go-to-market strategy, pricing optimization, and sales execution.

## SERVICES

### Agricultural Transformation

We create sustainable change for clients by combining proprietary tools and techniques with unmatched industry and functional knowledge.

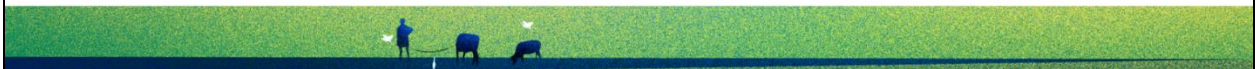


The agriculture industry is facing significant disruption, driven by macroeconomic, grower, and competitive pressures. Feeding an expected global population of 9 billion people in 2050 will require the industry to grow significantly while balancing resource pressure and increasing price volatility. We help clients address these pressing issues by identifying growth opportunities and working with them to achieve commercial excellence through go-to-market strategy, pricing optimization, and sales execution.

## Want Our Help?

FEEL FREE TO ASK! WE CAN HELP  
YOU GROW

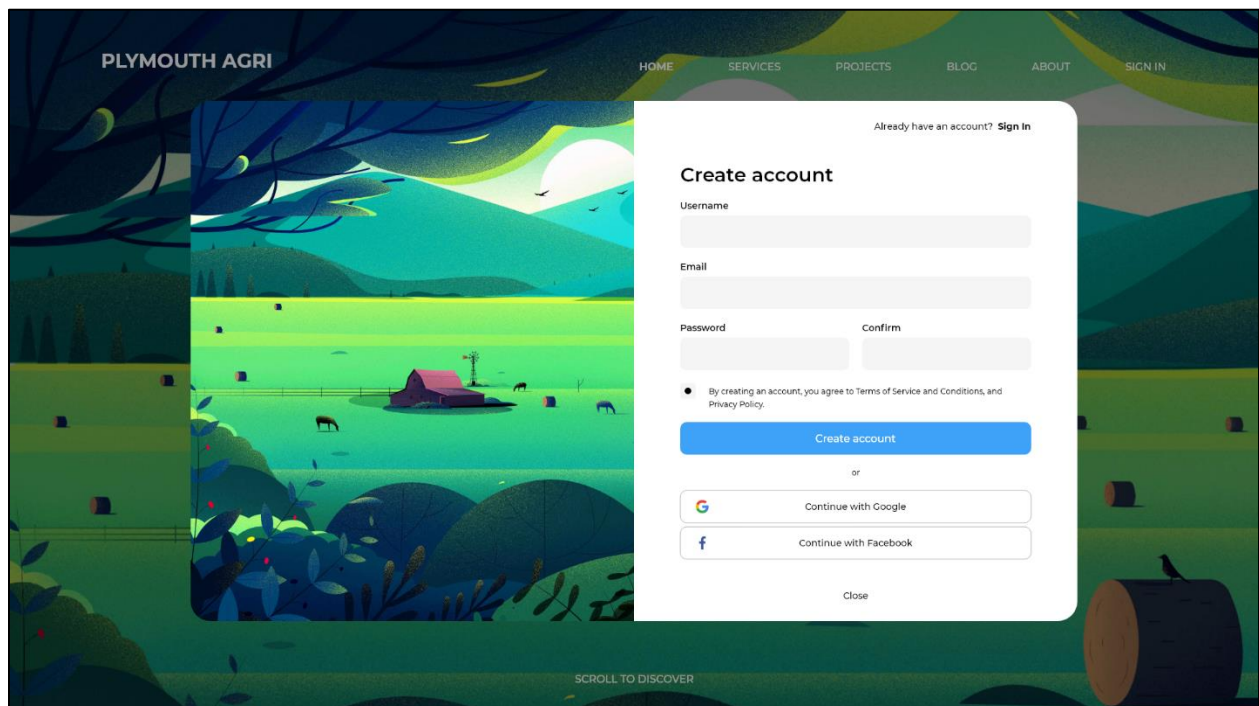
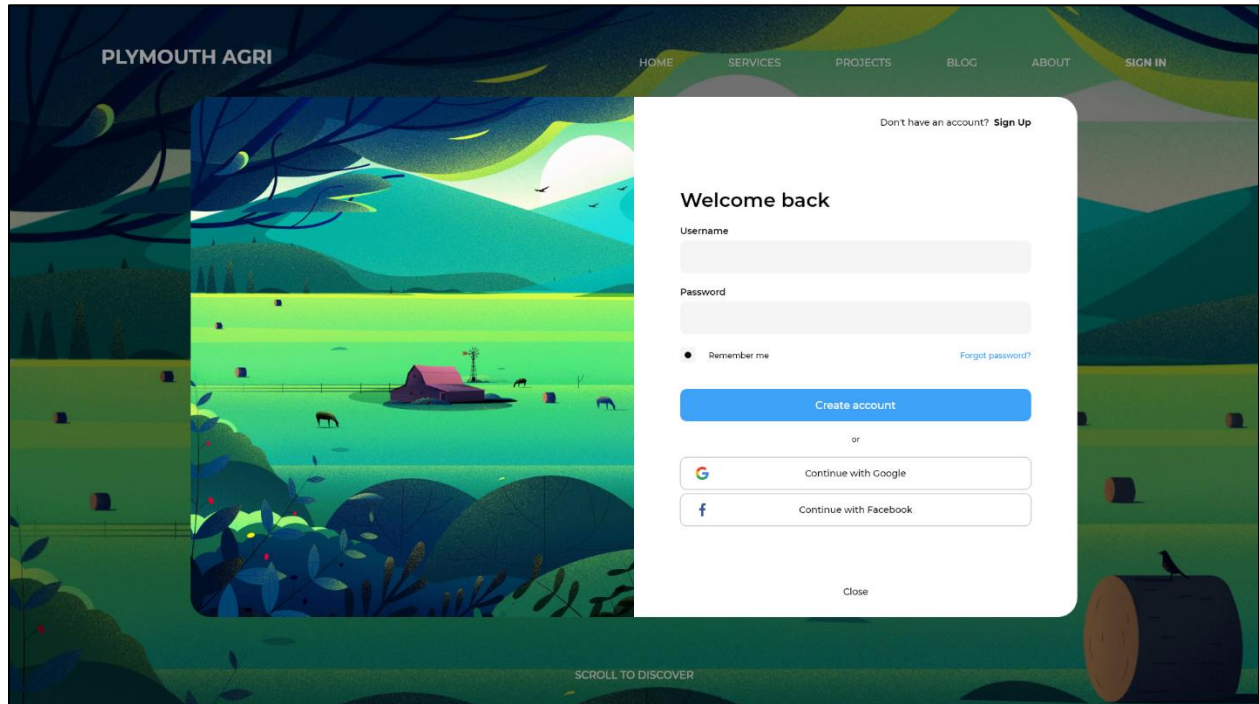
SEND





## 7. Sign in & Sing up

The sign in and sign up works as pup up cards. User can access to sign in by clicking the sign in button on the navigation bar. If they don't have an account, they can create an account through sign up option available in the sign in card.



## Chapter 8 – Usability Evaluation Results

### Testing

#### Alpha Testing

Alpha testing is the first wave of testing of the prototype done by the group.

In this scenario the this testing was conducted while and after designing the prototype.

#### Beta Testing

Beta testing was conducted using help of friends who are not on our group.

Using them as users we were able to get better feedback and design a better prototype.

### Test cases

Farmer:

- Read blog
- Read articles on services
- Get services

Researcher:

- Read blog
- Post article
- Read articles on projects section

Scientist:

- Post on blog
- Read blog
- Contact company about their projects

## Chapter 9 – Conclusion

We had to research on all the important details about HCI when conducting this project. We went through the module HCI in depth as a community, referring to lecture notes and related websites. Then we gained a general understanding of interface design principles. As a result of these considerations, we chose proceeded as planed on the project.

During the process of designing the website's interfaces, we heard about the process of designing interfaces. We learned the steps that must be followed when designing user interfaces. We have a lot of experience sketching interfaces and have squandered a lot of paper in the process. By doing so, we can see that designing interfaces entails several steps.

We followed the design principles in the process. We know that the original DOA website does not include any of the design principals because we gathered data using quaternary and evaluated it ourselves. We may deduce from the user feedback that they are dissatisfied with the website's interfaces as well as the content. So, we went through all of these issues and built an interactive interface using HCI design principles.

Many of the members of our community learned about HCI principles and how to properly build user interfaces.

## Chapter 10 – Group Details and Contribution

### 10.1 Group Details

**Group Name: ISAD254SL Team 10**

ID	Name	Degree Program (SE/CN/CS)
	D.M.S.H.Bandara	SE
	L.M.N.Fernando	SE
	E.A.T.D.Peiris	SE
	M.J.D.M.Minu	SE
	A.A.R.S.S.Perera	SE
	T.D.Liyanage	SE

### 10.2 Group Contribution

ID	Name	Contribution
	D.M.S.H.Bandara	<ul style="list-style-type: none"><li>• UI/UX research</li><li>• Low Fidelity prototypes</li><li>• Home page sections design</li></ul>
	L.M.N.Fernando	<ul style="list-style-type: none"><li>• Projects page design</li><li>• Sign in Sign up screens design</li><li>• Report preparation</li></ul>
	E.A.T.D.Peiris	<ul style="list-style-type: none"><li>• Conducting usability evaluation</li><li>• Low Fidelity prototypes</li><li>• About section design and information gathering</li></ul>
	M.J.D.M.Minu	<ul style="list-style-type: none"><li>• User persona design</li><li>• Blog page design</li><li>• Report preparation</li></ul>
	A.A.R.S.S.Perera	<ul style="list-style-type: none"><li>• Projects page design</li><li>• UI/UX research</li><li>• Assets management (images, illustrations, fonts etc.)</li></ul>
	T.D.Liyanage	<ul style="list-style-type: none"><li>• Conducting usability evaluation</li><li>• Services page design</li><li>• Presentation preparation</li></ul>

## Chapter 11 – References

- Department Of Agriculture: <https://www.doa.gov.lk/index.php/en/>
- CIC Holdings: <https://www.cic.lk/>
- Coconut Research Institute: <https://www.cri.gov.lk/>
- Cellular Agriculture Society: <https://www.cellag.org/>
- Floret Flowers: <https://www.floretflowers.com/>