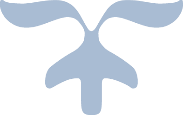


ENTERPRISE WEB SOFTWARE DEVELOPMENT

COMP1640



**TEAM PRIME**

GIT-HUB REPOSITORY:

<https://github.com/steshor/gre-prime> GOOGLE DRIVE REPOSITORY:

[https://drive.google.com/drive/folder](https://drive.google.com/drive/folders/0B40vjbUs9BsoYTFpWF9MandLNkU) [s/0B40vjbUs9BsoYTFpWF9MandLNkU](https://drive.google.com/drive/folders/0B40vjbUs9BsoYTFpWF9MandLNkU)

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# Database

MySQL was the chosen database technology in the development of the Magazine Management System (MMS), this was due to its ability to work in parallel with web applications as required by the specification, MySQL has been optimised for web applications, ensuring that MySQL has high performance rates, enabled by InnoDB, making it suitable for; small to medium project scopes, as discussed by Oracle, 2011 – as a result we decided use MySQL.

In total, there 7 tables implemented within the database, essential to ensuring the desired functionality of the application is adequately supported. A “Users” table, responsible for storing user information, included a hashed

password and email address allows individual account allocations to be made, as well as assigning roles (discussed in 1.3). A user is capable of adding multiple contributions, and each contribution is capable of having multiple images attached to it. No files are stored directly within the database tables, in the interest of performance and end user experience. Instead the file path is stored, and the physical files are stored on the file server. Role implementation, referential integrity and security within the database are discussed in greater detail in the sections below.

## Security

Security within the database was of high importance. The user table is responsible for storing details concerning staff members as well as students, and as such appropriate measures have been taken to ensure their integrity and confidentiality this sensitive information. MySQL offers robust authentication methods to prevent malicious attacks, this was utilised through phpMyAdmin, providing an effective UI to manage the privileges, enabling the flexibility to control of user permissions with minimal difficulty –access was only granted to team members who required permissions to carry out their tasks. As such, the database designer and application developer were the only two

team members who had direct ‘root’ access to the database. Other team members could then be granted a lower level of access, to only allow them to view records, thus ensuring the preservation and the integrity of the table structure as well as the data.

In addition to the database’s own security features; no plain text passwords are stored within the “User” table.

Instead, the application generates SHA 1 hashed passwords which are then later compared with the user’s password attempt at log in, if the passwords match, the user is allowed to enter the application. This means, even in the

unlikely event of a security breach user’s accounts won’t be compromised and therefore user credentials cannot be utilised by an attacker.



*Figure 1 - SHA1 Hashing*

## Appropriate Data Types

Within the database design and implementation, various datatypes are used, to ensure that each of the columns are cable of storing relevant information to meet the client requirements and therefore support the front-end application - without the correct datatypes it would difficult, or in some cases not even possible achieve the MVP (minimum viable product).

A key example of this, and a requirement was to ensure the user’s last log in time and date will be displayed upon their next log in. A TIMESTAMP datatype was the most appropriate datatype to use in this case as it displays the relevant information in a concise format (see figure 1) as well as to store the most appropriate way to store this information, generated by the application ensuring all data in this column is kept in a consistent format. A VARCHAR datatype could also have been used here - it would store the same information. However, in the interest of data analysis, this would be extremely difficult to manipulate with SQL commands, where the TIMESTAMP can be manipulated with a DDL statements.



*Figure 2 – Database Timestamp*

## Role Implementation

In order to implement the roles specified by client and user stories, two values are assigned to every user in the database; RoleID and a FacultyID. RoleID will determine what tasks the user is capable of carrying out within the MMS, for example access to certain areas of the application are restricted to a particular RoleID, e.g. RoleID =1 is assigned to the Admin, as such the application will only allow the user with that role to access administrative pages, and carry out tasks associated with the admin role, where RoleId=4 is a student and will allow the user to upload a contribution.

FacultyID is used to identify which faculty a staff member or student belongs to, allowing staff members to view, comment and approve magazine articles uploaded by students of their faculty, and similarly this allows the guest account associated to a faculty, to view contributions which match the FacultyID of the particular guest account e.g. guest account for the Law faculty is facultyId= 5, therefore the Law guest account can only view contributions submitted by Law students.

## Referential Integrity

Referential integrity is enforced throughout the design of the magazine management system using appropriate

constraints. It’s critical to supporting the functionality of the application and meeting the specified requirements for the overall product. As depicted in the ERD (see figure 2), the entire database comprises of 7 tables. Each use a primary key to uniquely identify rows, where foreign keys are used to logically link tables together. This ensures that tables will only accept values which are considered ‘good’ data, diminishing the possibility of ‘bad’ values being entered – INSERT statements must therefore satisfy all constraints.

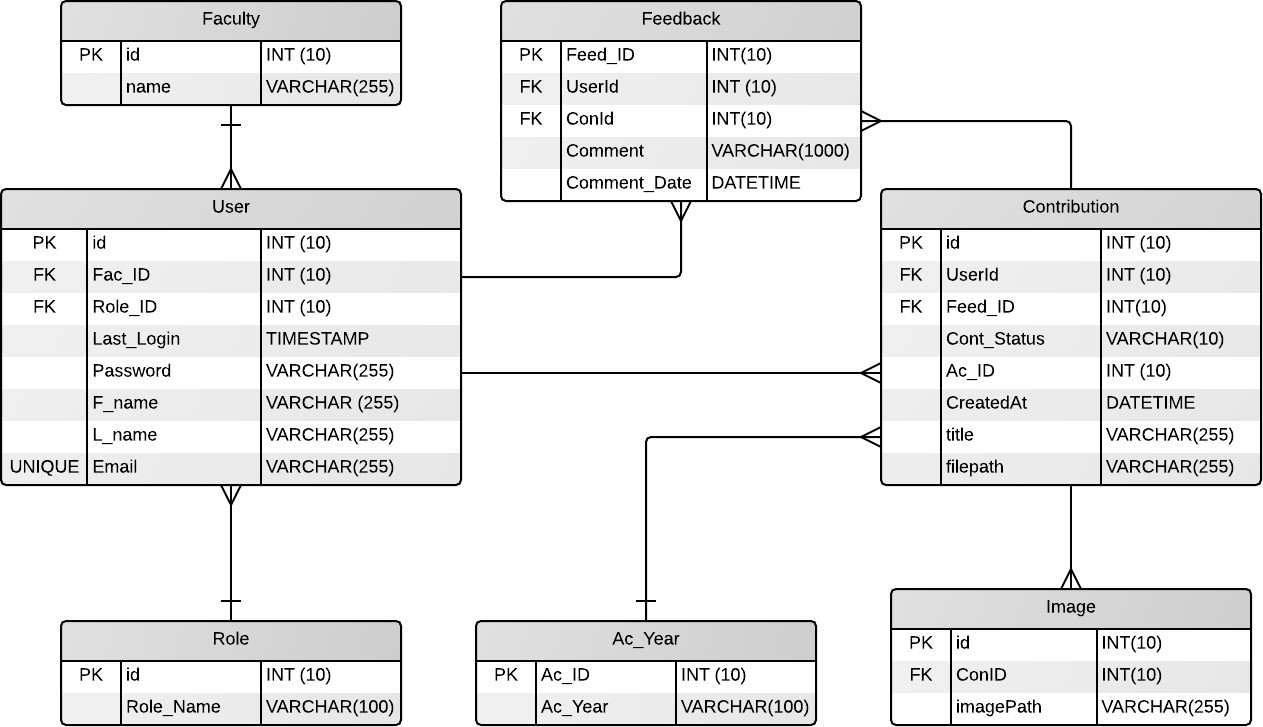
Using foreign keys also allows other functionalities to be implemented, such as; multiple image uploads. A contribution (a magazine upload) has its individual primary key, and the details relating to the contribution e.g. title, file path and which user uploaded it are stored in the “contribution” table – as such this column is set to auto increment to ensure no duplicate clashes occur. A second table named “images” is linked to the “contributions table using a foreign key, which references the primary key of the contribution table. Meaning that multiple images can belong to the same contribution. In a similar way, the database will also allow for multiple comments to be assigned to a magazine contribution.

### Validation

Users log in and gain access to the application using their email address, this will be unique to an individual – an email address cannot exist twice, making it a suitable way to identify. In order to enforce this aspect within the database a UNIQUE key is used on the email column. This again relates to ensure the table is only capable of accepting ‘good’ data, allowing an email address to only exist once.

## Design Documentation

To ensure that all necessary required features could be implemented, an ERD (see figure 2) was developed for the magazine management system’s database which ultimately supports the frontend application, in achieving the required functionality – this is especially the case for role implementation and allowing multiple images for a contribution. 7 tables have been implemented in total, each contain appropriate constraints, allowing links to be formed between one another.



*Figure 3 – Entity Relationship Diagram for our MMS System*

# Site Design

Site design is one of the key requirements in this project. To comply with modern day design, Team Prime has discussed various aspects of the site design throughout the project’s life cycle. Key aspects that have been

integrated during the research phase have ensured that all types of users can easily navigate and access our system. To make the website more accessible with the addition of providing an ease of usability, a well thought-out navigation process was created throughout the site.

One of the key factors which was considered was the aesthetic appeal to the website. This was specifically considered, to make sure the website was produced to a professional standard and in compliance with HTML5 specification.

Another consideration that took dominance over the website was selecting a suitable colour scheme that would consistently be used throughout all webpages. The colour selected, gave a more user friendly approach with the addition of meeting the client’s requirement as well.

Finally, the use of frameworks allowed our website to consider a more flexible and responsive approach, by

providing benefits to our website’s aesthetic appeal. This was done by making use of ready-made frameworks like bootstrap.

## Usability Heuristics

In order to ensure the system met industry standard usability criteria, Nielsen’s Heuristics were followed throughout the design process, in order to comply to what user’s will be used to and not to overcomplicated the UI, thus keeping the design simple, consistent and easy to use.

### Nielsen’s heuristics, (Jakob Nielsen 1995)

Visibility of system status:

Ensuring users of the MMS system are always aware of what section of the section they are in, as well as what tasks the application is currently running for the user is critical to ensure that the perceived complexity of the system is kept low. As such appropriate headings should be used on each page to inform the user what is expected of them, as well effective use of notifications to confirm that certain actions have been successful, for example a pop notification to alert the user that their submitted contribution has been recorded.

Match between system and the real world

As the application will be used within a higher education environment it’s vital to consider users who do not have English a first language, as such text used should only be implemented where necessary and language kept simple. In addition, page contents should follow a logical order e.g. when a user is filling out the submission form to add their contribution to the system, the form elements should be displayed in an order which is natural to the user, so the form should start with the title of the contribution at the top of the form and end with the user confirming they have read the terms and conditions, and clicking submitted- it could be confusing to place the upload button before the user has selected a file to upload.

User control and freedom

As the application will use a consistent theme throughout in order to keep the system as easy to use as possible, therefore will utilise the same positioning of the navigation bar, should they make a mistake by clicking the incorrect button or link and wish to quickly abort their decision they can always navigate back to the homepage no matter where they are in the application, by clicking the MMS logo – this is common practice in modern webpages, and therefore will be utilised by conforming to what the user is used to.

Consistency and standards

Throughout the design of the application a consistent design will be used enforced by the use of Bootstrap, will mean that all objects within the pages will always remain in the same location, regardless of what section of the application the user is in. Therefore, the user will always know the outcome of the button they want to click, e.g. when a pop out message is displayed the “OK” button will always dismiss the message. As such any other “OK” button used anywhere else in the system will be reserved for that purpose, making the system easily predictable for the end user. As well as these factors, the same colour scheme will be utilised, whilst ensuring that the logout button and logo remain in the same location at all times.

Error prevention

Validation will be utilised where possible, to highlight to the user what elements are required and therefore causing an error. For example, on the log in screen, required fields which are not filled, should then be highlighted to the user when they attempt to log in. Ensuring that users understand their mistakes and will therefore aid in their experience of the MMS.

Recognition rather than recall

Users should not be required to remember what’s required between each page. If information does need to recalled, the MMS should automatically attain that information without any user input. In addition, there should also be small chunks of information to describe what the user can do on a particular page as well as how to achieve that task. This will be particular useful when uploading an article, ensuring that all areas of the system functionality are covered, and users aren’t therefore required to guess how to carry out certain tasks.

Flexibility and efficiency of use

As mentioned previously there will be a common navigation bar used on every page of the application, in the case where more options could be required by the user a secondary navigation bar will be displayed, which will provide access to more options, acting as a work flow aid to easily navigate to required sections of the MMS in order to carry tasks – this will therefore differ in content, depending on the user’s role.

Aesthetic and minimalist design

Adopting a simple and perceived clean, minimal user interface design will aid in keeping the MMS as easy to use as possible. Avoiding overcrowding the screen will ensure that the tasks can easily be easily be carried out and the pages navigated without confusing the user by overloading them with un-needed information and images. As such the MMS will adopt a minimalistic approach, only displaying what is essential to the task at hand. In addition, careful consideration of a colour scheme will be given to ensure the chosen colours complement one another, thus providing aesthetically pleasing design.

Help users recognize, diagnose, and recover from errors

It’s critical that any errors are handled properly at code level, and that they are caught, enabling the application to display a meaningful message to the user, allowing them to rectify the problem. For example, if the user must agree to the terms and conditions and instead of a textual pop-up explaining the cause, an exception error is thrown, it could be confusing to the user and might therefore prevent them from using the system again.

Appropriate hints will be displayed to users of the MMS, to help point them in the correct direction and achieved their task.

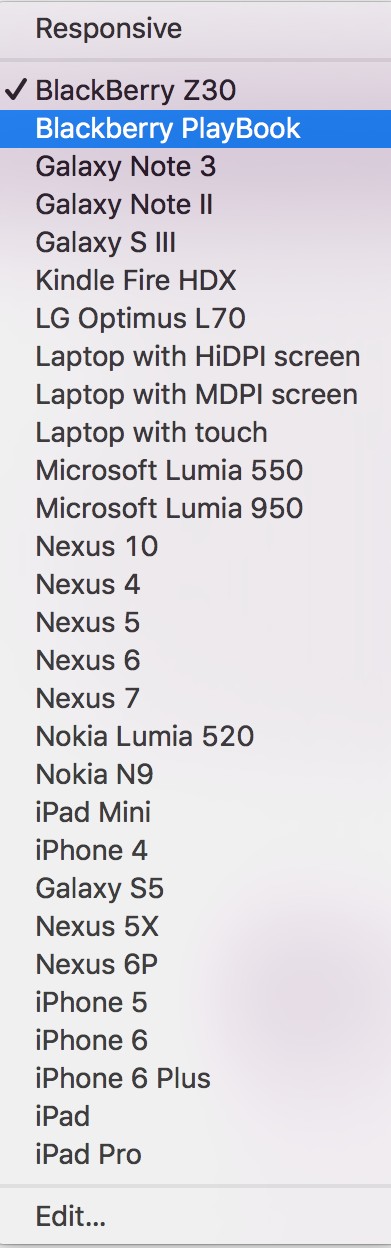
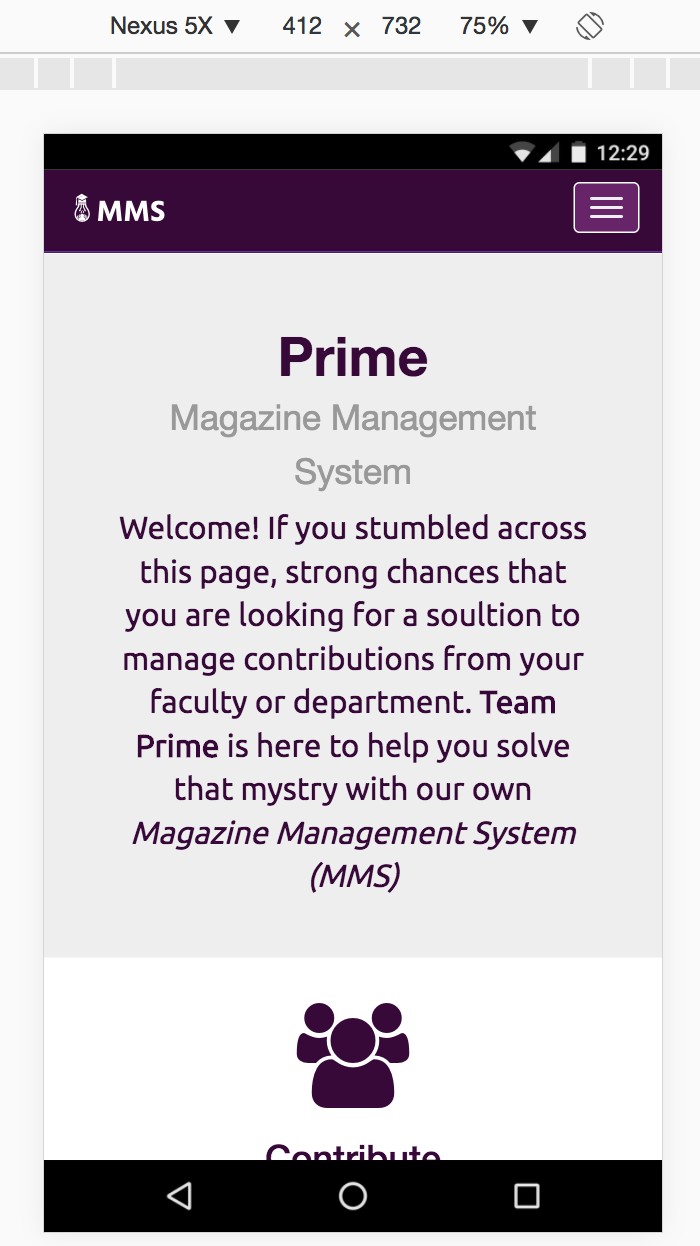
Help and documentation

Help documentation in the form of small textual snippets will be provided when necessary, so as to not overwhelm the user with unnecessary information, especially if it isn’t directly concerned with the task. As a result, instructions will be displayed on the page, where the user is carrying out the task, described in the text snippet.

(Nielsen, 1995)

## Usability

Front-end design, back-end code structure and other modules of MMS website are developed by focusing on high usability of the system. The responsive design of the website makes it user friendly and platform independent. It enables users to use system regardless their devices, the website layout is compatible with all screen sizes and browser types. MMS website is tested against variety of devices each with different screen size. The list of devices is mentioned below with responsive layout screen shot (figure 4). Google chrome developer tool has been used to as a device simulation.



Responsive layout result example

Mobile, desktop, iPads, and laptop devices with different browser and screen sizes used to test the response layout

## Accessibility

*Figure 4 Device list and responsive layout example*

The Human computer interaction (HCI) factors have been considered to choose the colour scheme of the website. The below mentioned are some crucial factors which makes MMS website accessible for all types of audience and also help users to complete tasks efficiently.

### Colour factor

A recent research shows that purple, pink, red colours are more defusing colours. It helps users to remember the website by its different segments such as buttons, tabs, links etc. (Elliot AJ, Maier MA, 2014).

### Colour scheme for colour blind people

Colour blindness has its many kinds and some of them are Protanopia, Deuteranopes, Monochromacy. People with these nature of colour blindness have limited vision to distinguish between red, blue and yellow colour. With this, purple colour is best fit for all types of vision. Purple colour can still differentiate between different components of a web page such as the navigation bar colour, active tab colour, and different heading (Colourblindawareness, 2017). The below mentioned pictures shows the result of colours with above mentioned colour blindness (figures 5-8).

#### Normal vision result



**Normal vision** people can see the purple colour, this is MMS website navigation bar and font colour

*Figure 5 - People with normal vision*

#### DEUTERANOPIA color blind result



**DEUTERANOPIA**

**Color blind**: The colour still makes different with other colours.

*Figure 6 - DEUTERANOPIA colour blind people*

#### PROTANOPIA Color blind result



**PROTANOPIA Color**

**blind:** People with this colours blindness can see the purple colour as navy blue colour

*Figure 7 - PROTANOPIA colour blind people*

#### Monochromacy Color blind result



**Monochromacy Color blind:** People see the colour as dark grey

*Figure 8 - Monochromancy colour blind people*

## House Style Consistency

Bootstrap was utilised in the design of the MMS system, enforcing a consistent style, in doing so it also allows for a wide range of benefits, such as; ease of maintainability and reusability as discussed below.

### Maintainability

Firstly, the website design can be updated easily should the stakeholders require any changes, without having to replicate the change for all pages which need updating. Allowing for efficient changes to the site design to be made as when and when they are required. For example, should the stakeholder require their logo to be updated due to branding change within the University, this can be done in one location and will affect all pages which use the logo.

### Reusability

In addition, it enabled the reuse the same design for different components of a website providing consistency throughout the website, as well as avoiding code duplication, enabling the implementation a light weight application design, which wouldn’t be impacted from then end client’s bandwidth restrictions. Also, the use of Bootstrap enabled the implantation of a mobile site which is discussed in greater detail in section 2.2.

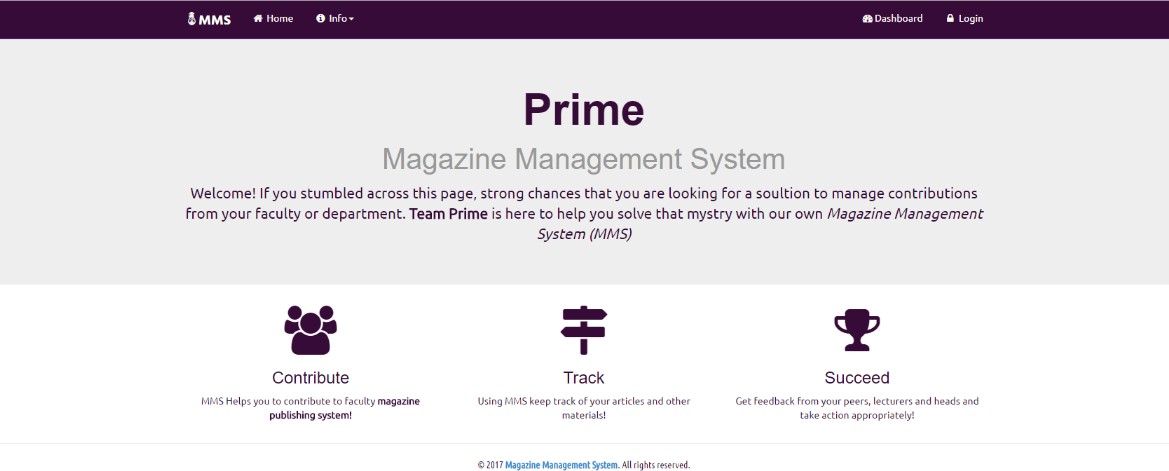
## Responsive Design

As the use of mobile is becoming an increasingly popular platform, being utilised by users to access websites and work during commute time, as opposed to traditional platforms such as desktop or laptop, as such the MMS caters for this market also. As such it has integrated support for devices with smaller screens implemented through Bootstrap. Discussed below is how a responsive layout is used consistently throughout the MMS allowing for a fully scalable design, regardless of the user’s screen size.

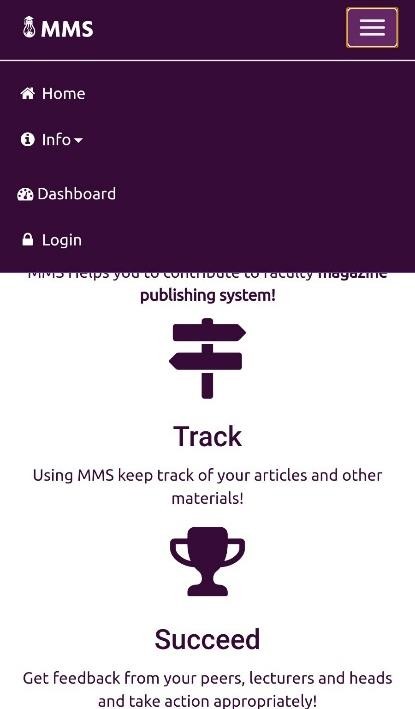
### Use of Bootstrap

Bootstrap is a CSS framework, originally developed for Twitter’s own use the developer decided to make it available under the General Public Licensing (GPL) (Bootstrap, 2016). As it has evolved over the years many high-profile organisations like BBC, Microsoft, CNN and many decided to make use of it. Essentially, it is pre-complied CSS that can be attached any project to build a simple or very complex web sites while freeing up the time of developing own CSS rules.

Within the MMS project, Bootstrap CSS was the central point all design aspects, visible to the user. As discussed above the use of this framework allowed the MMS to be fully scalable, seen in figure 9 is an example of the landing page for the Magazine management system, this is how the desktop version will be viewed by the user. Whereas figure 10 demonstrates the landing page displayed on a mobile device. Demonstrating how the same content is successfully re-organised to allow the user full access of the application, regardless of their chosen device.



*Figure 9: Desktop view of the MMS landing page*



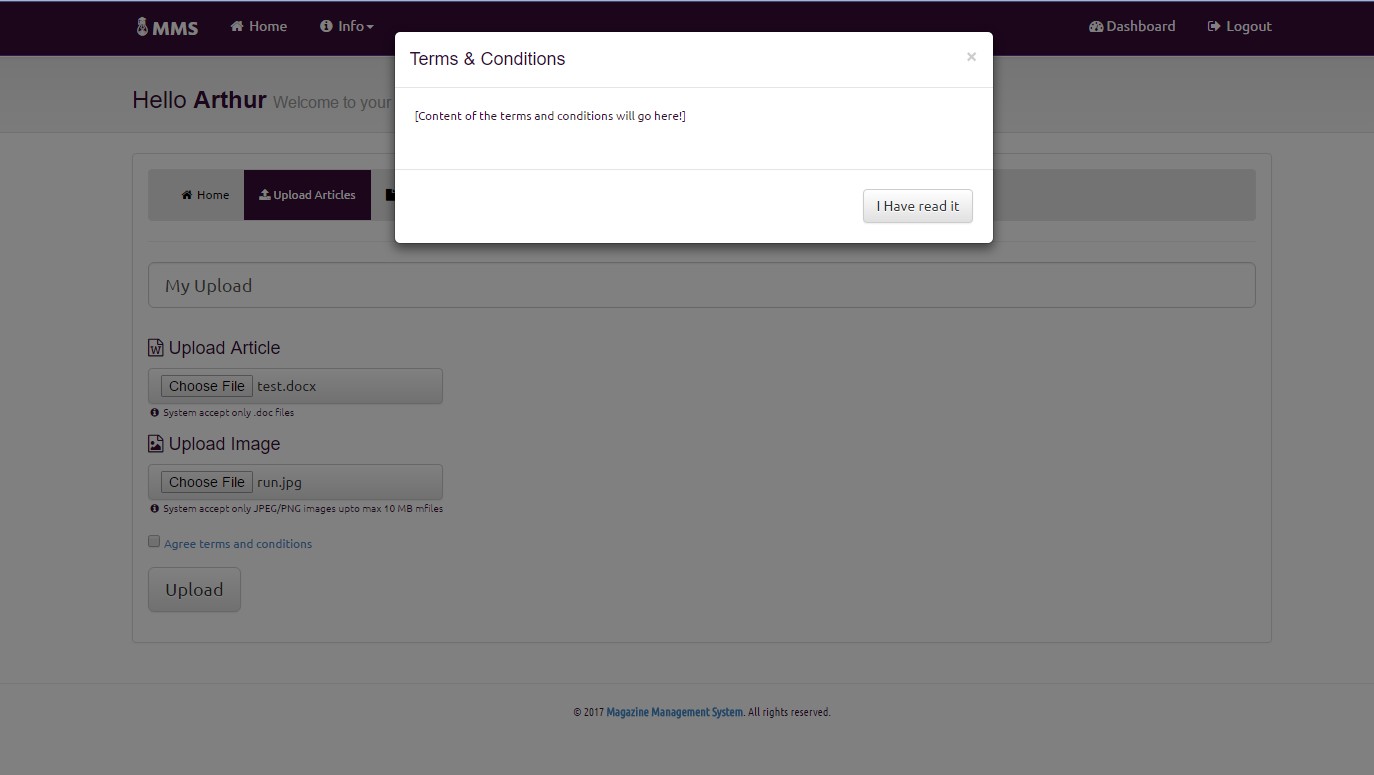
*Figure 10: A Mobile view of the MMS landing page (right).*

## Other technologies utilised

In addition to Bootstrap, project MMS also takes advantages of:

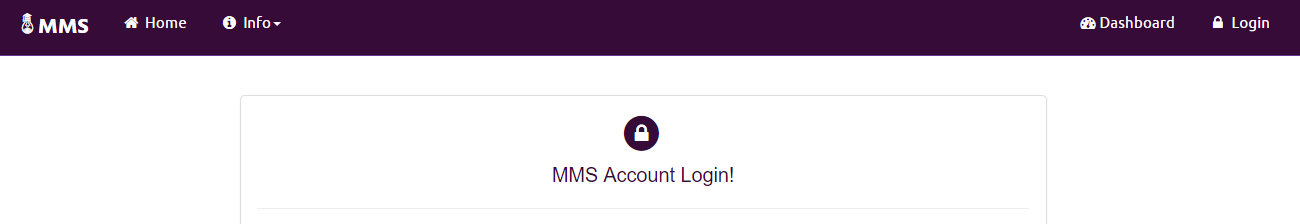
**jQuery** – a leading JavaScript Framework. jQuery is a mandatory requirement for some of the bootstrap elements to function properly. For example, the main navigation bar on the top of the page uses jQuery to display or hide certain elements or objects when user clicks on the link or buttons. Although, without jQuery this navigation will load normally as visual element but any elements like drop-down buttons will not function.

Most of our form validation done using back-end programming like PHP, jQuery can be used to validate data on the fly. In MMS, jQuery is heavily used in the back-end section show or hide certain elements like pop-up notification or hidden page elements on-demand. Below is screenshot of the jQuery in action as displayed in figure 11.

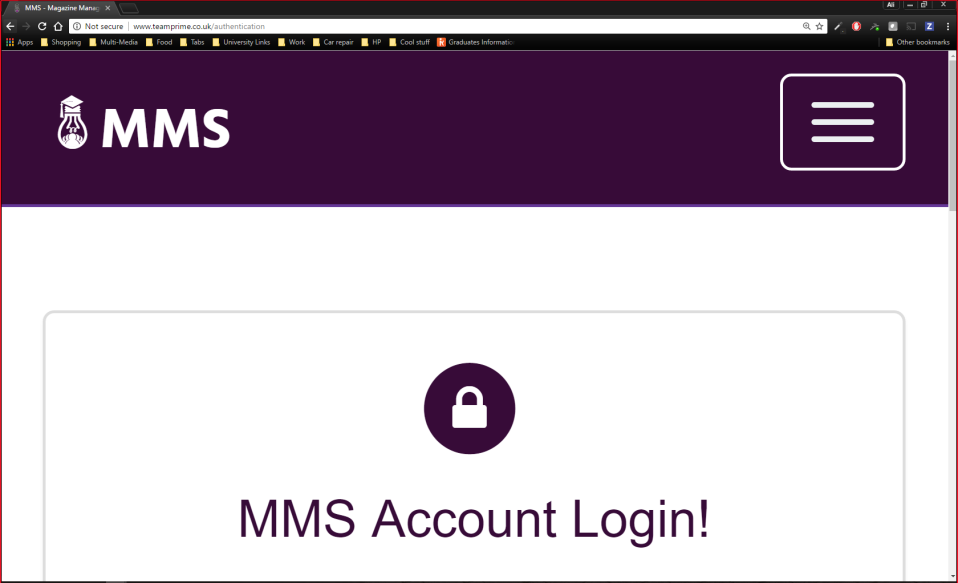


*Figure 11: Terms & Condition Pop-up is triggered when user click on the link on the main window (darker window behind).*

Another technology utilised is; Font Awesome in the implementation of the MMS design, and is a set of custom vectors based Icons that are converted to web font. Currently the, latest version is 4.7 and has 675 icons that can be used in to any project under GPL agreement. Since the icons are vector based, they are resolution independent meaning they look sharper on any device. Font-awesome is compatible with any modern web browsers, supporting the scalability of the site design for smaller and larger screens, as demonstrated in figure 12 where figure demonstrates the same page, zoomed in, without affecting the quality of the icons used. Figure 13 represents how well icons respond to altering screen resolutions.



*Figure 12: Extensive usage of Font-awesome Icons can be seen though out*



*Figure 13: Zoomed in at 400% -icons adapt, no distortion.*

As well as Awesome font, Google Web Fonts was also used within MMS project as highlighted in figure 14 and 15, two Google fonts were used:

**Ubuntu** (Three variant) as demonstrated in figure 14:

*Ubuntu - sans-serif* used in the body in general.

*Ubuntu Condensed* - sans-serif used for footer text and links.

*Ubuntu Mono* – monospace used for formatted texts like Codes, Pre-format Tag etc.

**Hind** – used in the Logo of the MMS (in main navigation).

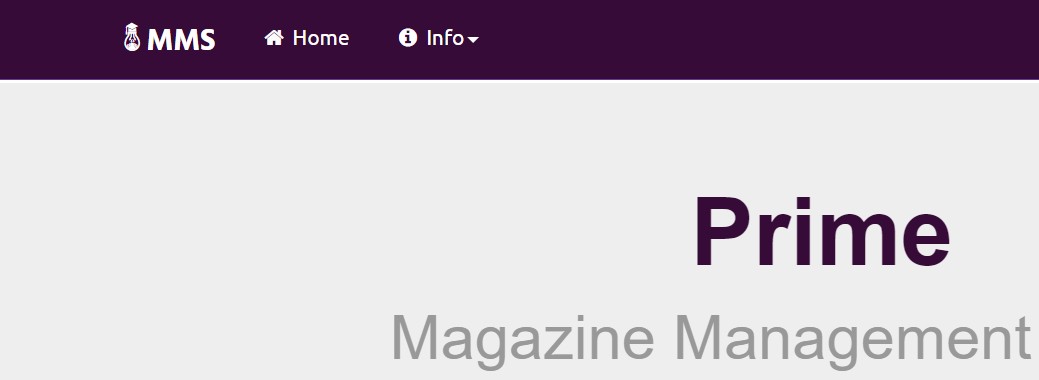
Reasons to use google web font to have consistent look and feel throughout as MMS web site is not relaying on font that are installed on end user’s device. Instead, fonts are embedded and downloaded when user access the page. In addition to this, the MMS logo itself as seen in figure 16, is a web font icon, as discussed previously, this means that it’s a scalable vector, allowing it to adapt and fit to any device the user is accessing the application with. As also demonstrated in figure 13, the icon retains its integrity regardless of its resolution.



*Figure 14: Google Web Font Ubuntu used in main body text*



*Figure 15: Google Web Font Hind used in the navigation bar*



*Figure 16: MMS Logo Implementation.*

## Other aspect considered

As one of the co-developer of the MMS’s front-end design, loading of the page was a key factor to be taken in to consideration. Since the application will be pulling the data from the database, pulling resources like web font from CDN servers, there is extra care taken to reduce the page load speed to an acceptable level. Here are some precautions take while coding for MMS project:

## Minimal use of images

There is no use of images in the MMS, all images are handled through vectors to ensure they are all fully scalable as discussed above, thus not impacting the professional feel of the system, if for example images became pixelated, or the user was required to scroll to fully see the image.

## Deferral of Script

Most of the embedded JavaScript external or internal are loaded after the page loading is done. This is a one of the key recommendations when Google Page Speed, (2017) is used to scan the MMS, identifying various aspects which could be used to improve the system.

### Use of CDN servers

All external services are taken from recommended CDN servers provided by the developer. CDN servers generally uses the user’s location and serves the content from a nearest available server. For example, if someone from Sydney visits MMS site, all referenced content will be served from a server that located within Sydney or within

Australian territory, reducing the load time required, ensuring the user’s experience of the application is not impacted as a result.

## Keeping it basic

Throughout the MMS site design all aspects of the site are kept to a bare minimum, e.g. there are only two colours used throughout, fonts are consistent throughout, textual information is displayed to the user in smaller and digestible blocks, so as to avoid overwhelming them with too much information – thus resulting in poor usability design. An example of why this ideology was utilised within MMS, was extracted from Google’s homepage. As it

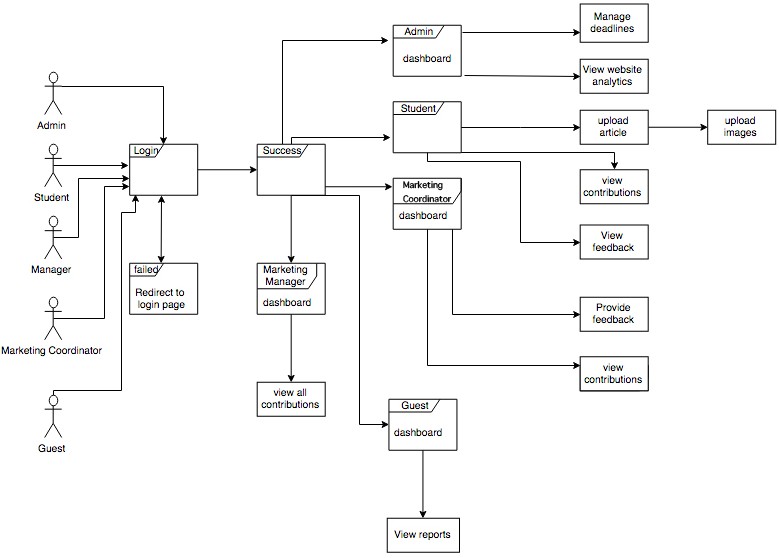
utilises a simple design, enabling a user of any ability to make use of its incredibly powerful technology, additionally MMS has a very simple navigation and information architecture, allowing users to navigate and carry out their required tasks with ease.

## Information Architecture

A well-structured information architecture of a websites makes it user friendly, people oriented, maintainable and easy to use. Information architecture helps to organise, structure and label the contents of a website and highly focus on user interaction with website or an application. However, with no exceptions the foundation of MMS project and one of the key success of the system is its well designed and robust information architecture. It serves several crucial functionalities for user such as, it helps users to hunt required information easily and guide them to complete a task on a website.

As in most of the cases users performs CRUD operations while using any website or an application. This is the same case with MMS project. While writing, reading, presenting data to the MMS system its Information architecture helps user to understand about their current location on a website and guide them with highly focused available options around them and as a result of an event the expected response. It also guides users to navigate between different pages of a website and help them to find required information by making an efficient workflow of website.

Information architecture played a vital role while constructing user interface design and interaction design of MMS project by developing wireframes for prototype of MMS project. Figure 17 shows our site map and how our workflow practises came into play.

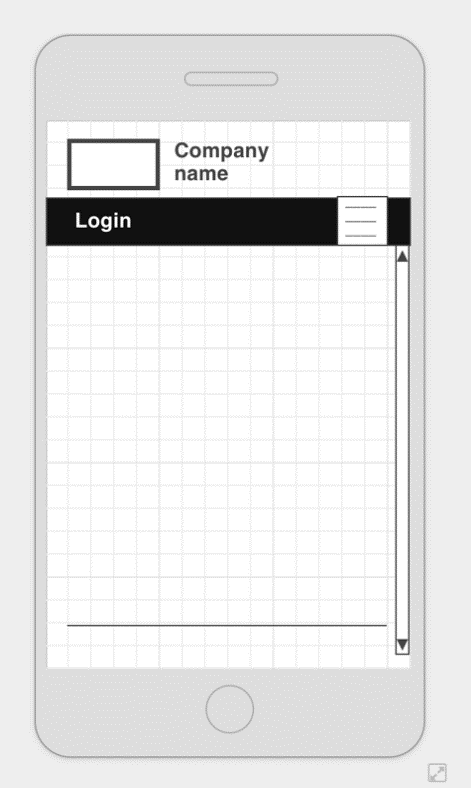


*Figure 17: MMS site map and workflow practices*

### Mobile Design

Wireframes are used to prototype the Information architecture. Here is a responsive layout for mobile devices. Home page view is mentioned below.

#### Mobile view – Home page



Footer section

Scroll bar for user friendly layout

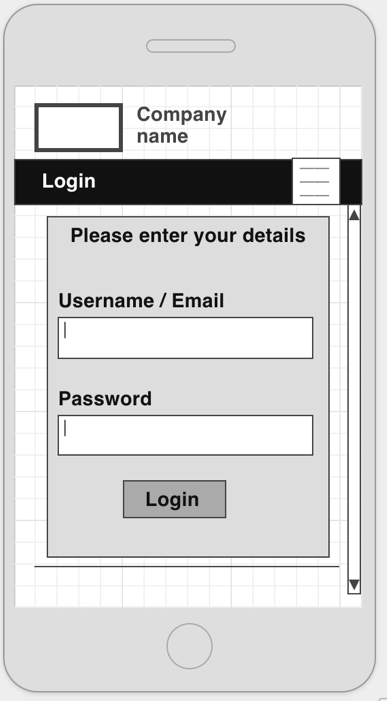
Navigation bar with dropdown (mobile Basic homepage)

Branding section

*Figure 17- Mobile view home page*

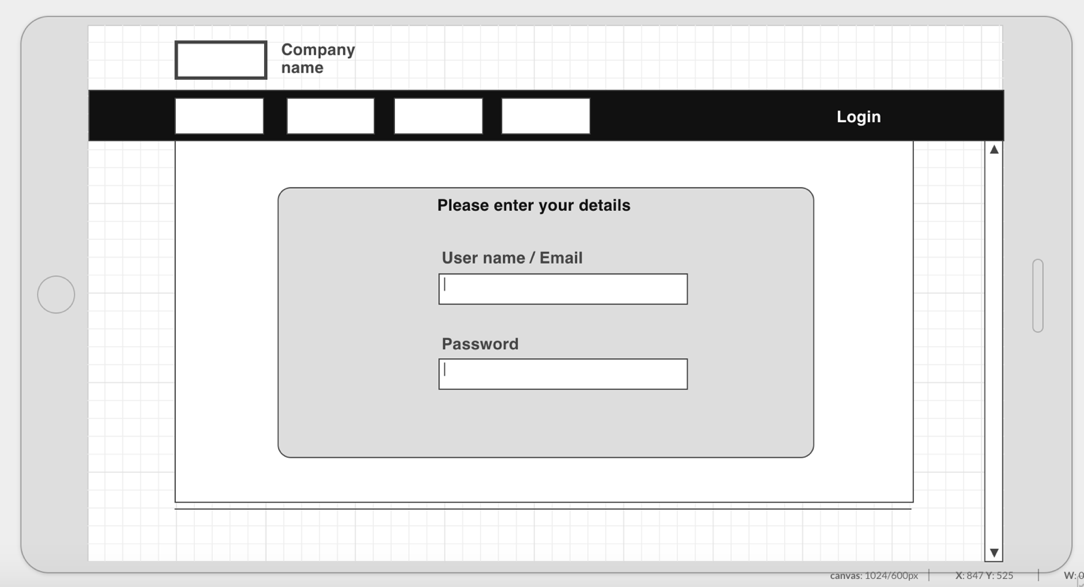
#### Mobile view – Login page

Login page with email, password input fields



*Figure 18 Mobile view login page*

**iPad landscape layout view of login page**



Navigation bar in landscape view without toggle button, but with navigation tabs

Responsive login page. iPad layout same as mobile view with a scroll bar

*Figure 19- iPad landscape view*

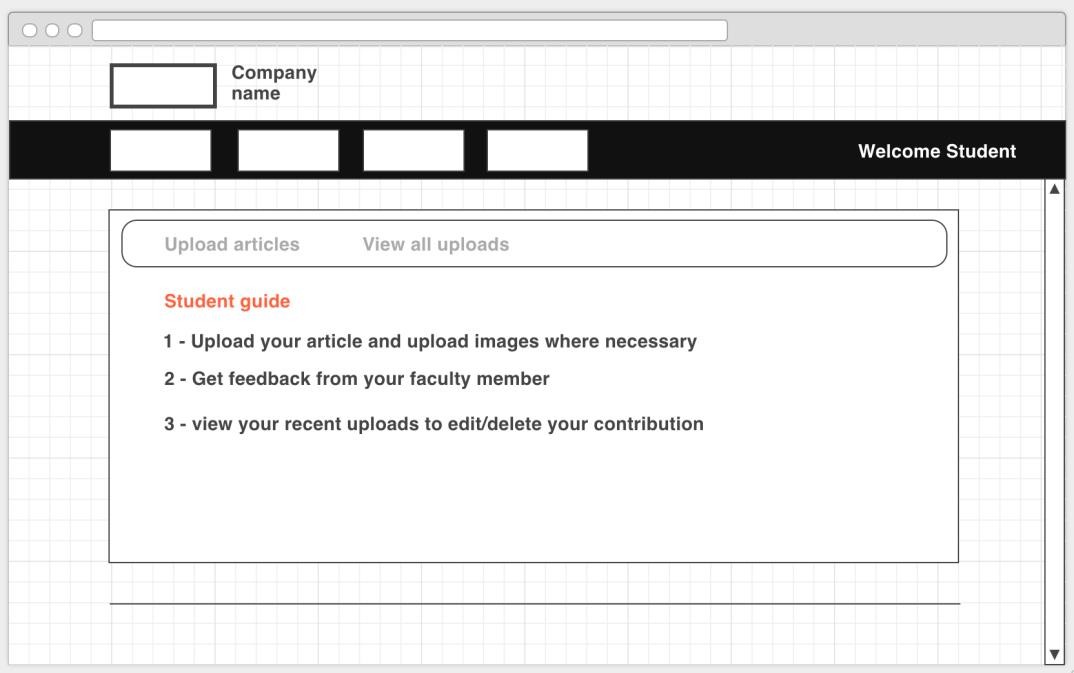
The above screen size is between 7.9-inches and this uses the desktop version of layout in landscape view. The vertical view looks exactly same as the mobile view mentioned above in (figure 18).

### Desktop Design

The login and home page for desktop version or for any other device that has a screen size larger than 786 X 1024 pixel or 6” will be similar to iPad view as the figure (19) mentioned above.

#### Student dashboard design

MMS project has more than 1 user type, all user interacts differently with system but they share the same design for example the dashboard design mentioned below. Figures 20-24 display a run through of the system’s functionality through the use of wireframes.



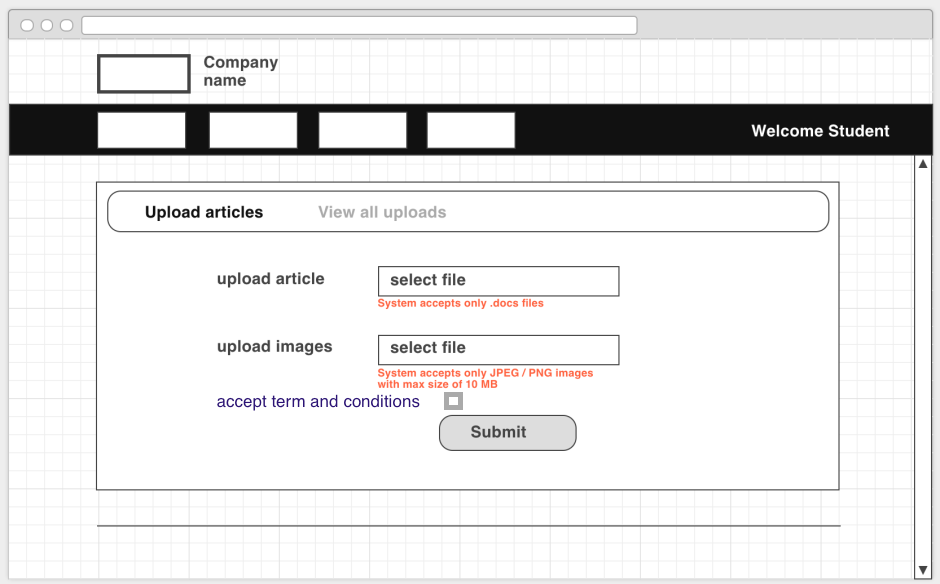
Footer section

User dashboard, with instruction for user.

Sub navigation bar for dashboard. This for student dashboard. All others user’s types share the same design

*Figure 20- Student dashboard*

#### Student upload contributions



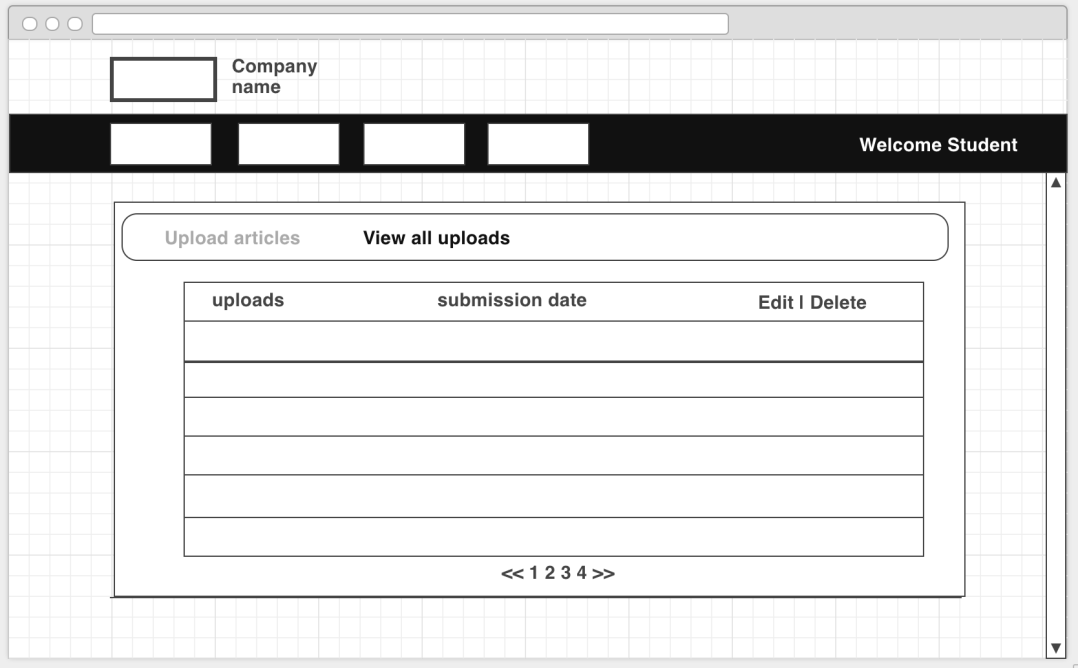
Terms and condition checkbox

Upload word file field and upload image filed with instruction for user

Active tab for upload

*Figure 21- File upload view*

#### Student dashboard - View all recent uploaded contributions

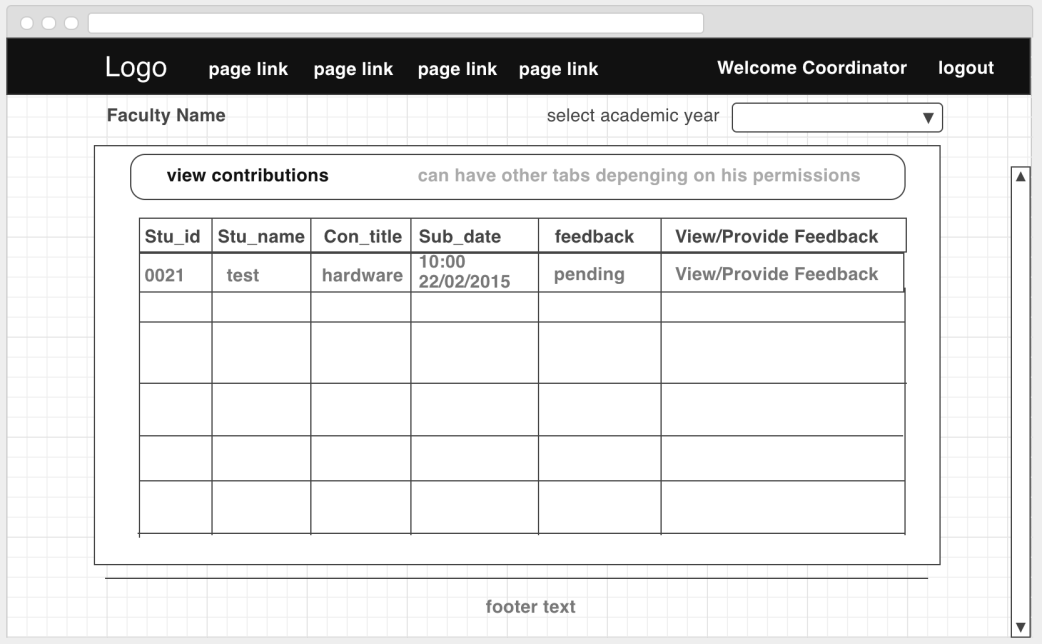


All recent uploads in a table

*Figure 2 View all contributions view*

Based on new CRs from client, website design has slightly revised. Some changes related to navigation bar has been made. Here is revised design for dashboard.

#### Revised view - Marketing Coordinator dashboard



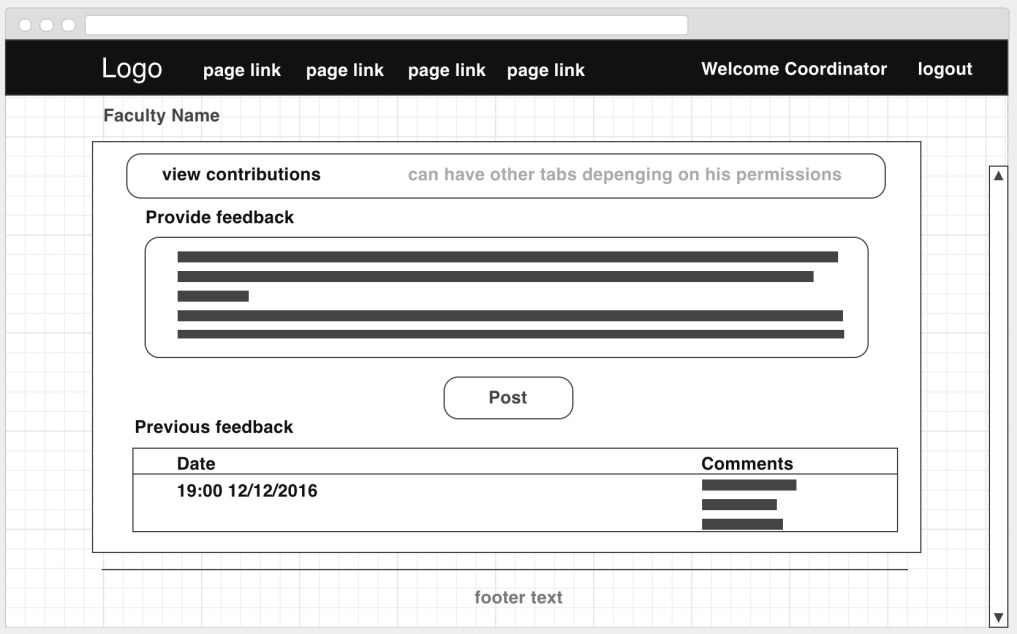
Footer section

Marketing-coordinator to view all contributions from his faculty and provide feedback.

Navigation with inline branding and page tabs

*Figure 23 - Marketing coordinator dashboard view*

#### Marketing coordinator view to provide feedbacks



View and select contribution from previous tan and provide feedback for contribution

*Figure 3 Provide feedback*

The basic design for dash board and a standard sub navigation bar stays same through the website for CRUD operations for different user types.

# Functionality

The project is built on the LAMP stack (Linux, Apache, MySQL, PHP) using Zend Framework 2 (ZF2). The project utilises modules and the Model-View-Controller (MVC) design pattern to separate the modelling of data from its presentation. Utilising this design pattern enabled us to fluidly collaborate as the developer (Stephen) could work on the modelling, routing and control of the application whilst making the data objects available to the View so the designers (Abrar and Noor) could focus on the presentation and user experience.

## Role based security

The security of the application and its data was a primary focus throughout the development of the project. A user authenticates using a password, the password is encrypted using a salt of the time combined with random number with additional entropy inside of an MD5 hash, and the salt combined with the user’s plaintext password is then hashed one thousand times using the SHA1 hashing algorithm. These enterprise level security considerations ensure that should the user database table ever be compromised it would require tremendous computational complexity to crack each individual accounts’ password. (*See Code Snippet 1).*

An `AccessControl` module takes advantage of Zend Framework’s `OnBootstrap()` method which is called after all modules are initialised. Here we define role based access restrictions and then manipulate routing using MVC events to route match against our predefined role based restrictions. (*See Code Snippet 2 & 3.)*

* 1. Submission of Contributions

A `Contribution` module is responsible for the creation, viewing and manipulation of user generated content within the site. We used Zend Forms and Zend Validation to receive and validate files and submissions. A student user is able to contribute many submissions to the magazine management system. A marketing coordinator user is able to view any submissions from students in their respective faculties, here they view, download and provide feedback to the students contributions. The marketing manager is able to view and download contributions from students across faculties.

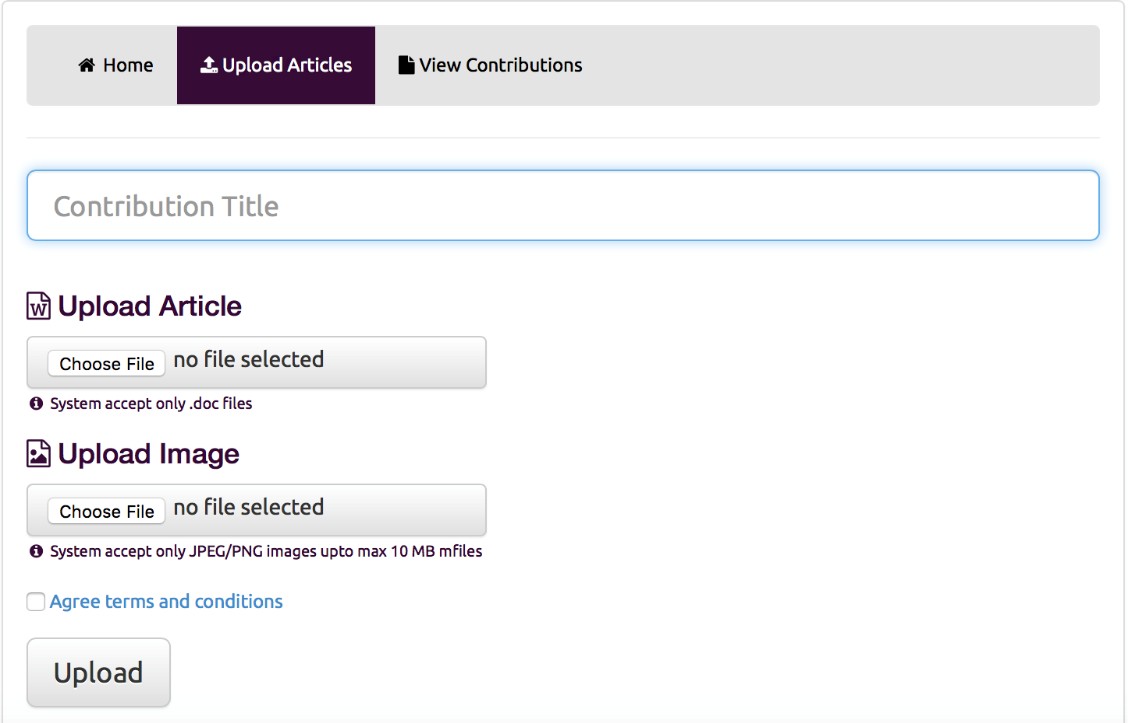
We used Zend Framework routing to allow for our feedback submission page and create more aesthetically pleasing URLs such as /contribution/detail/3 instead of Contribution/detail.php?id=3

*(See Code Snippet 4)*

In order to serve up views to different user types and retain the same underlying business logic we made use of

.phtml view templates to serve up different layouts from the same actions within our controllers.

*(See Code Snippet 5)*



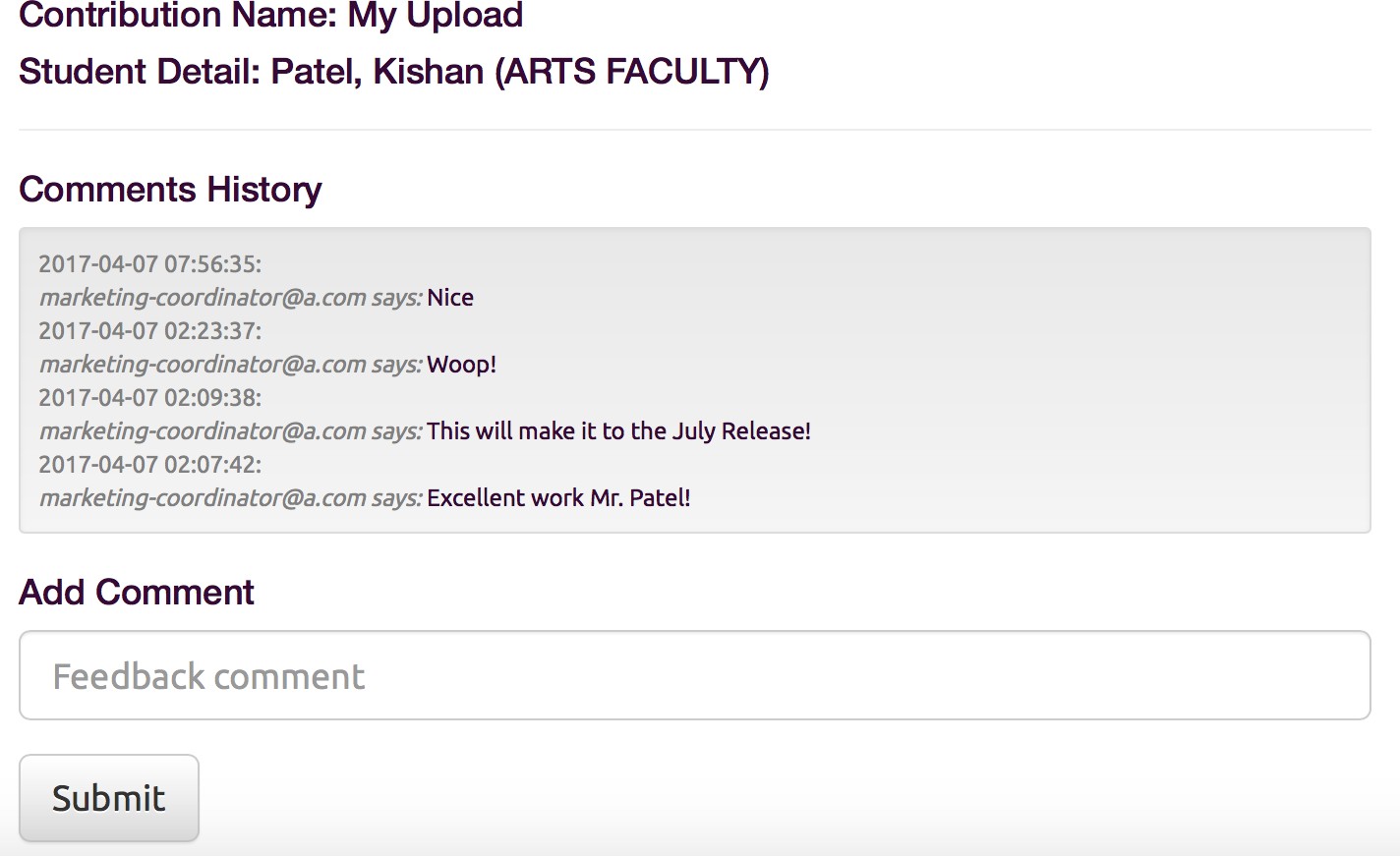
*Image I. The Contribution Submission Form*

* 1. Email Notification

Going beyond the specification to aid user experience a script and accompanying cron job was implemented to check any contributions without any feedback after 7 days and then remind the marketing coordinator to provide feedback within the 14 day period if no feedback was found. By implementing this feature Prime felt that they would see higher engagement with the magazine management system and thus, more contributions receiving feedback within the allotted 14 day period.

*(See Code Snippet #6)*

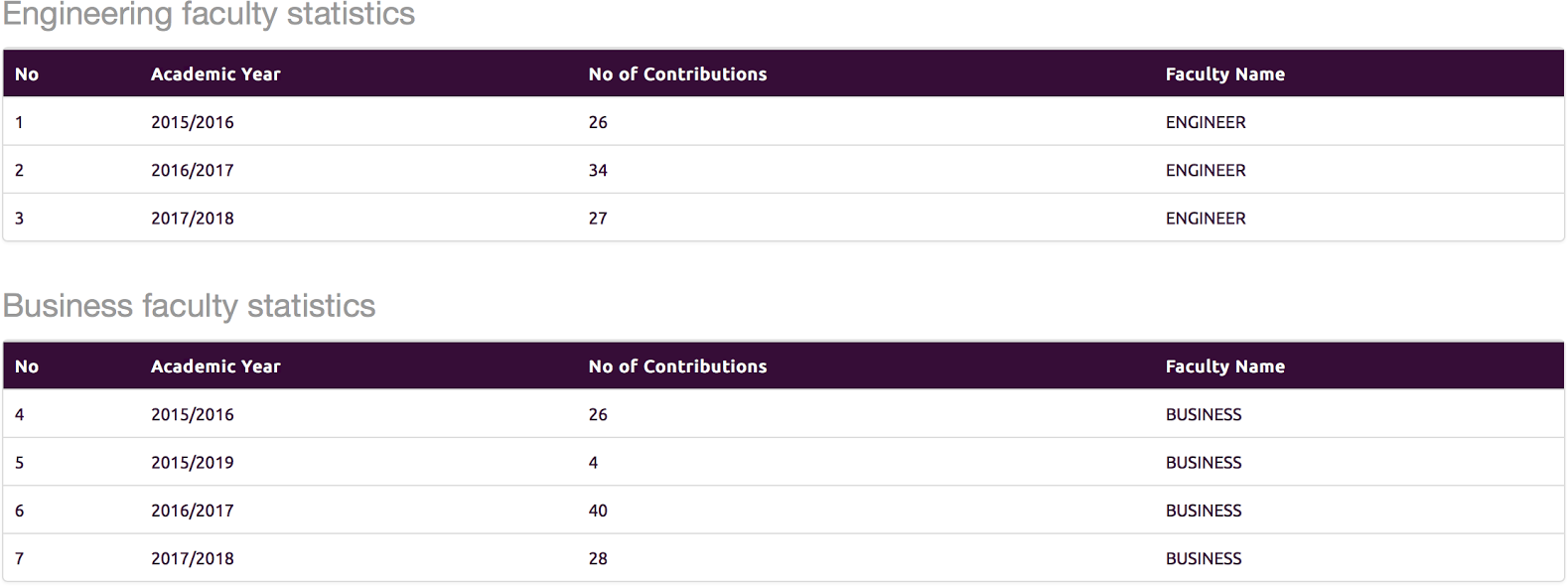
To provide feedback we made use of a ‘chat’ system where marketing coordinators and students were able to converse and discuss feedback in the form of comments on a contribution.



*Image II. Prime Feedback Chat System*

## Summary and Exception Reports

Various reports exist within the magazine management system. One example is the Faculty Summary Reports, these reports show the amount of contributions per faculty, per academic year. These reports are available for the marketing manager and guest users.



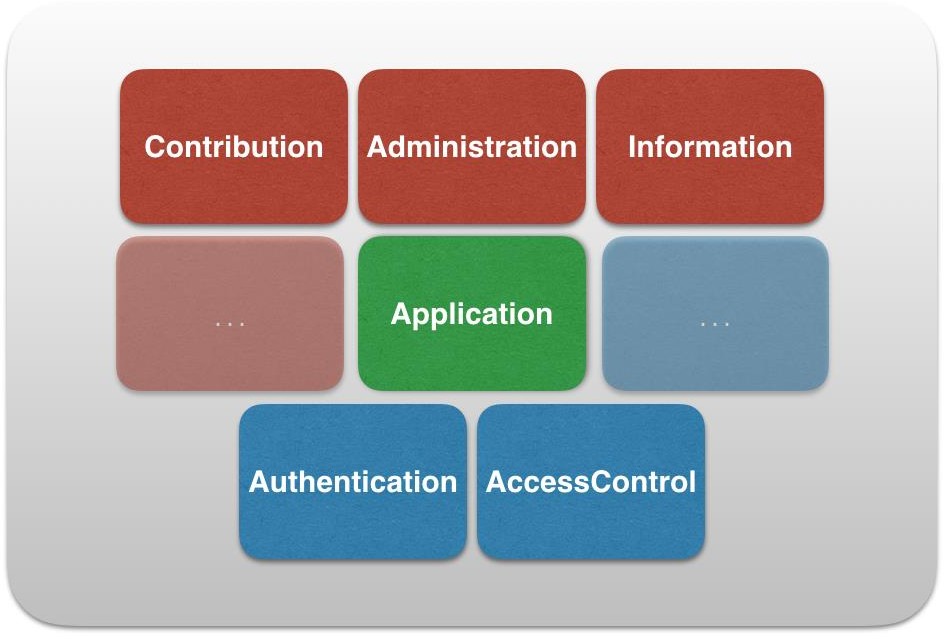
*Image III Summary Reporting*

The magazine management system also makes use of Google Analytics to capture usage metrics across the platform. The administrator is able to view a Google Analytics dashboard within their dashboard and view advanced metrics.

## UML diagrams

Using the modular Zend Framework there were no hard dependencies between the various functionality of the system. The users’ properties are accessed through an authentication service and the access control attaches itself to MVC events within the system. By architecturing this enterprise solution in this way we avoided a monolithic application, spaghetti code and avoided repeated conditional statements such as the following in all of our modules. Example:

if($user->role = "STUDENT" || $user->role == "GUEST")

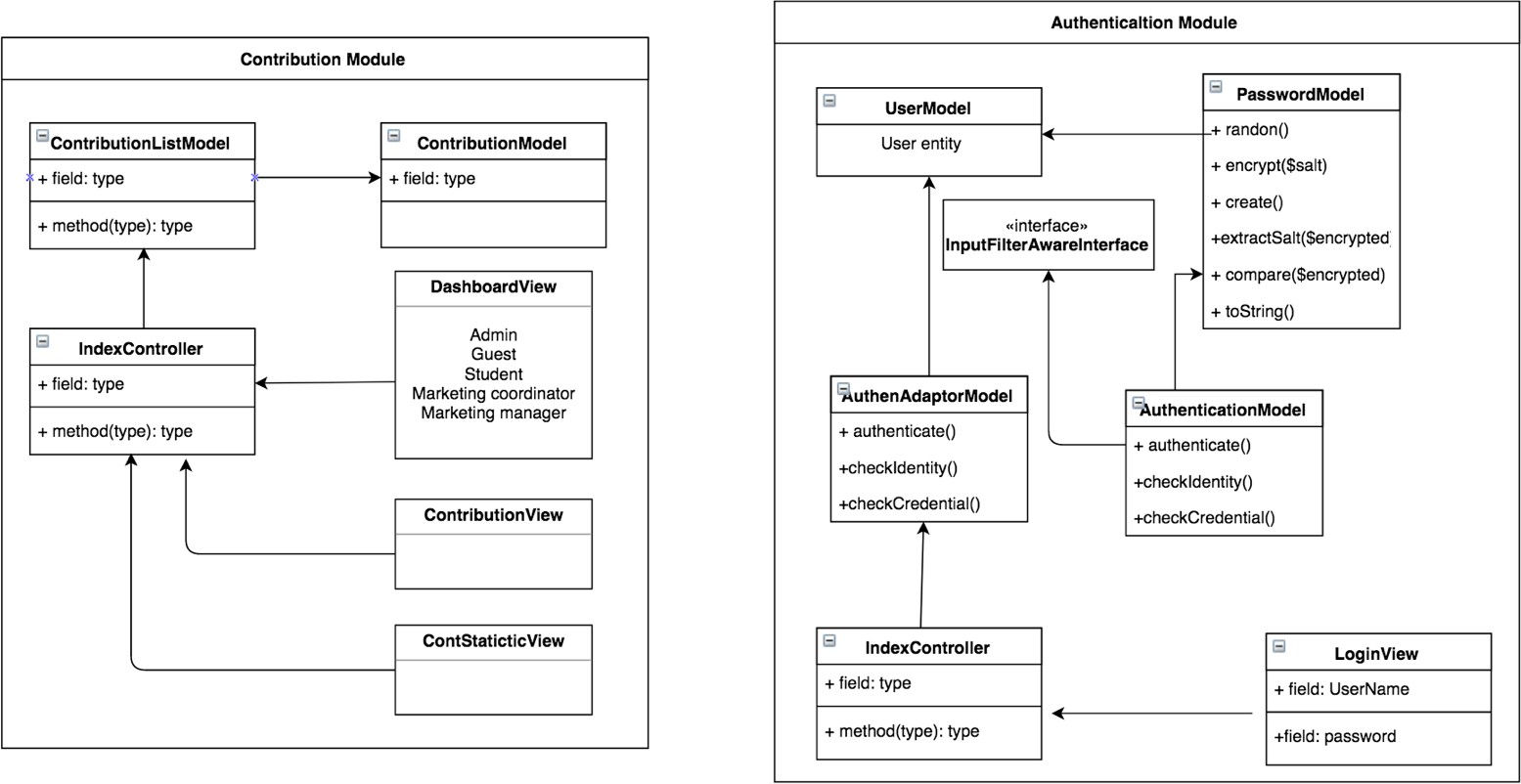


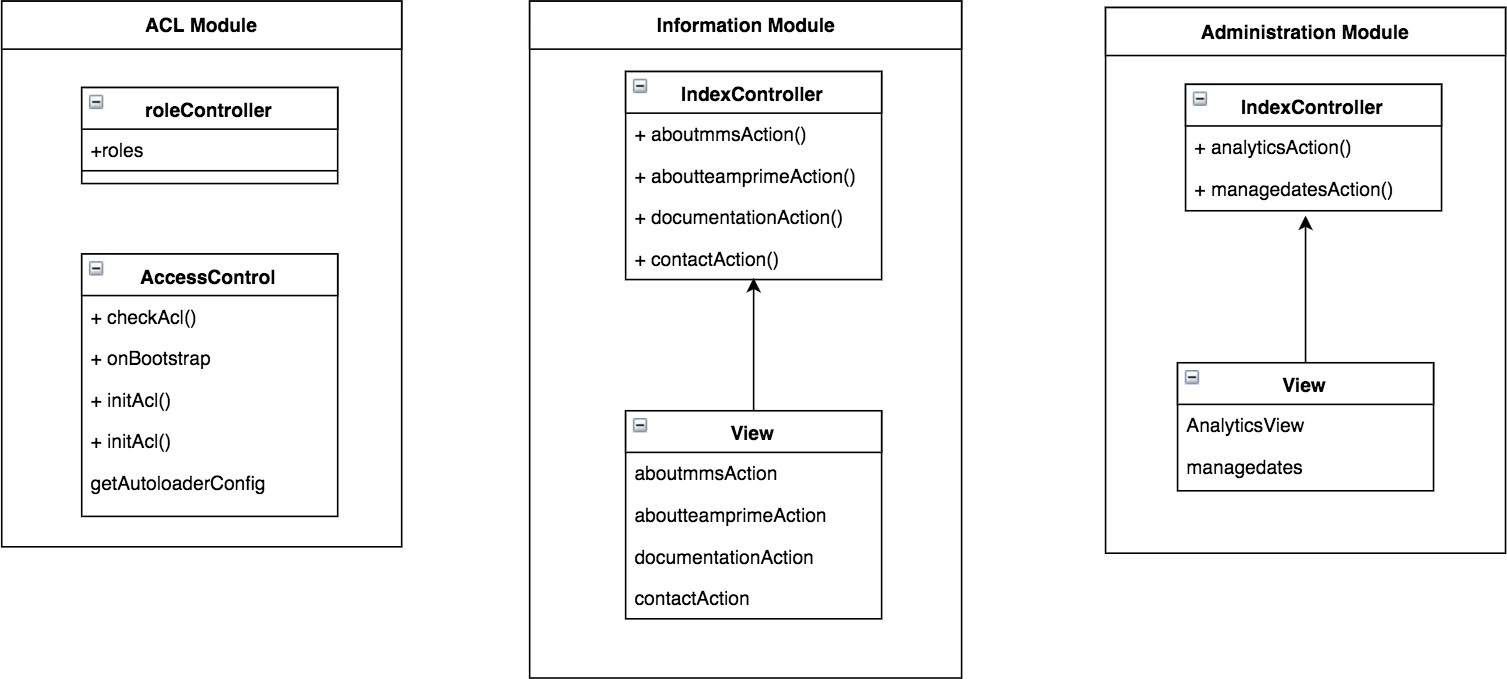
### Use case



*Figure 26 UML use case diagram*

### Class Diagram





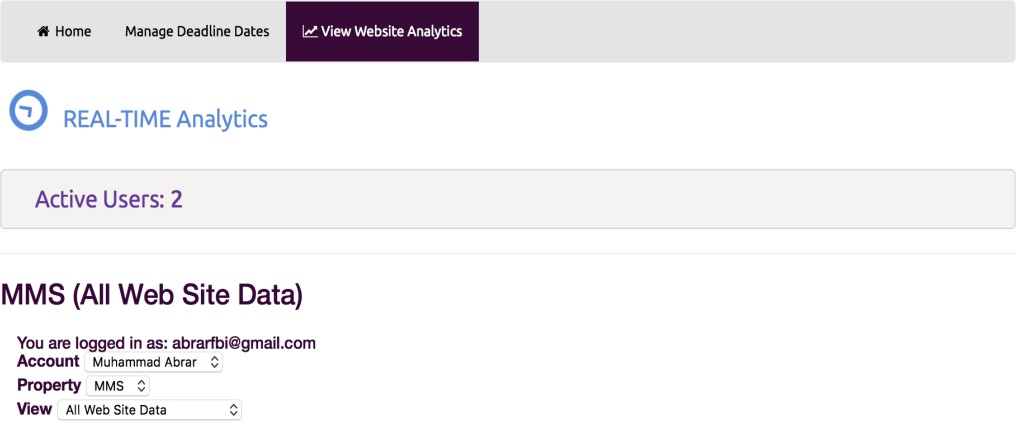
*Figure 27 UML class diagram*

## 3. [6](mailto:ma1107w@gre.ac.uk) Website Analytics

Google analytics (GA) are embedded on MMS website in order to get website analytics in real time and generate reports such as active users, most visited pages, traffic on website, origin of users, browser types are used to visit the website etc. These reports can be easily seen on google analytics dashboard. However, to show google analytics dashboard elements and required reports on MMS website directly, we created custom web elements using polymer (a java script framework) which helped us to create required elements to display the-afore mentioned reports on MMS website. Polymer uses google analytics API within the framework to get data from google in JSON format. The JSON data then represented in form of tables, charts and graphs by creating polymer elements. These elements are reusable and provide high maintainability. It is also possible to sort the data and get different metrics and dimensions for required analytics. For security purposes, it uses google sign-in API for authentication and only accessible by admin member of the system. Figures 28-34 demonstrate some screenshots of our analytics.

### 3. [6](mailto:ma1107w@gre.ac.uk) .1 Active Users in real time

The figure below shows the most active user on a website in real time and this dashboard is only accessible by admin user type of the system. As mentioned above, there is a second layer of security which verifies if the admin user is authorised to access the data by confirming users’ google identity.



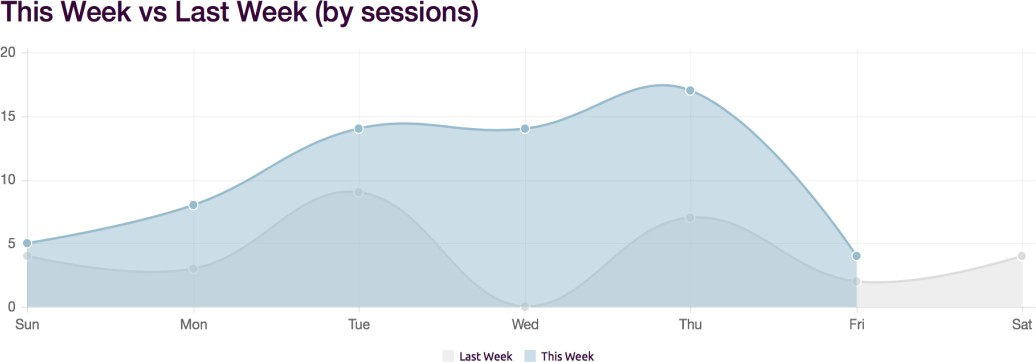
Logged in user and website details from google

Shows all active user on website in real time

*Figure 28 Active users*

### 3. [6](mailto:ma1107w@gre.ac.uk) .2 Weekly Sessions Report

The graph below shows the real-time traffic comparison on MMS website. It compares the current week active session with last week active sessions and depicts them in a line graph.

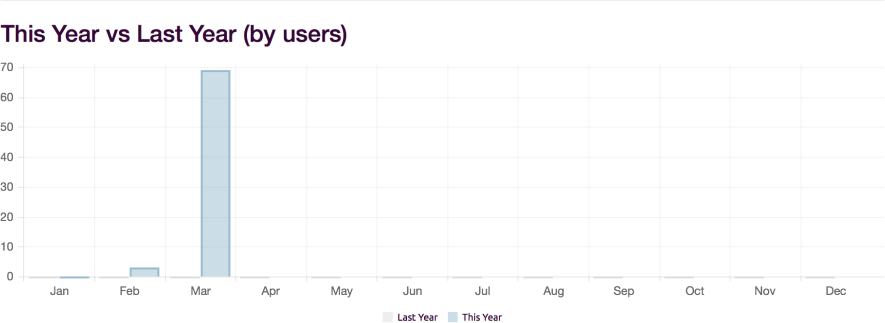


Shows traffic on website and compare it with last week

*Figure 29 Traffic*

### 3. [6](mailto:ma1107w@gre.ac.uk) .3 Yearly Report

Traffic on website on each year can be seen below. This report help companies to understand their website trend and to make decisions.



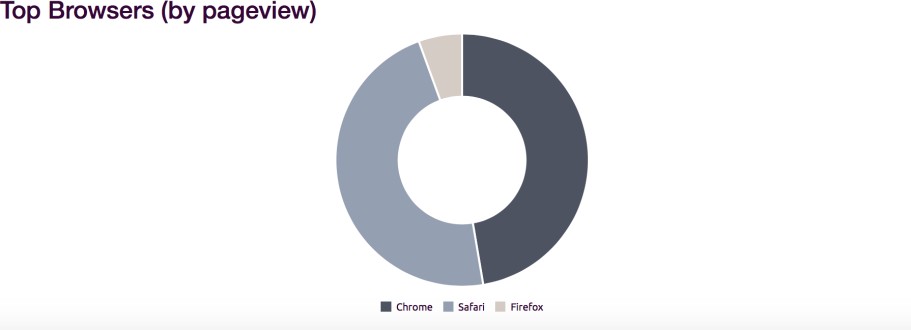
A report showing the yearly traffic on website and represent in a bar chart

*Figure 30 yearly report*

### 3. [6](mailto:ma1107w@gre.ac.uk) .4 Top Browsers Report

There are many browser types are available in present days. Every browser supports different functionalities and

compatibilities. Some of them are device oriented and support certain feature that other browsers don’t. The below mentioned report becomes very useful while developing and maintaining the website keeping in mind the browser trend.

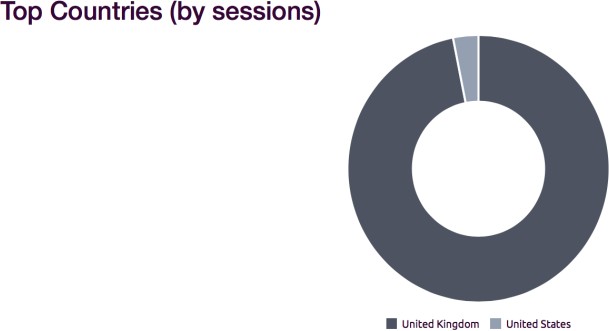


Browser names and colours that pie char represent

Pie chart to depict the top browser used to visit the website. It shows different colour for different browsers.

*Figure 31 Top Browsers*

### 3. [6](mailto:ma1107w@gre.ac.uk) .5 Traffic from Countries

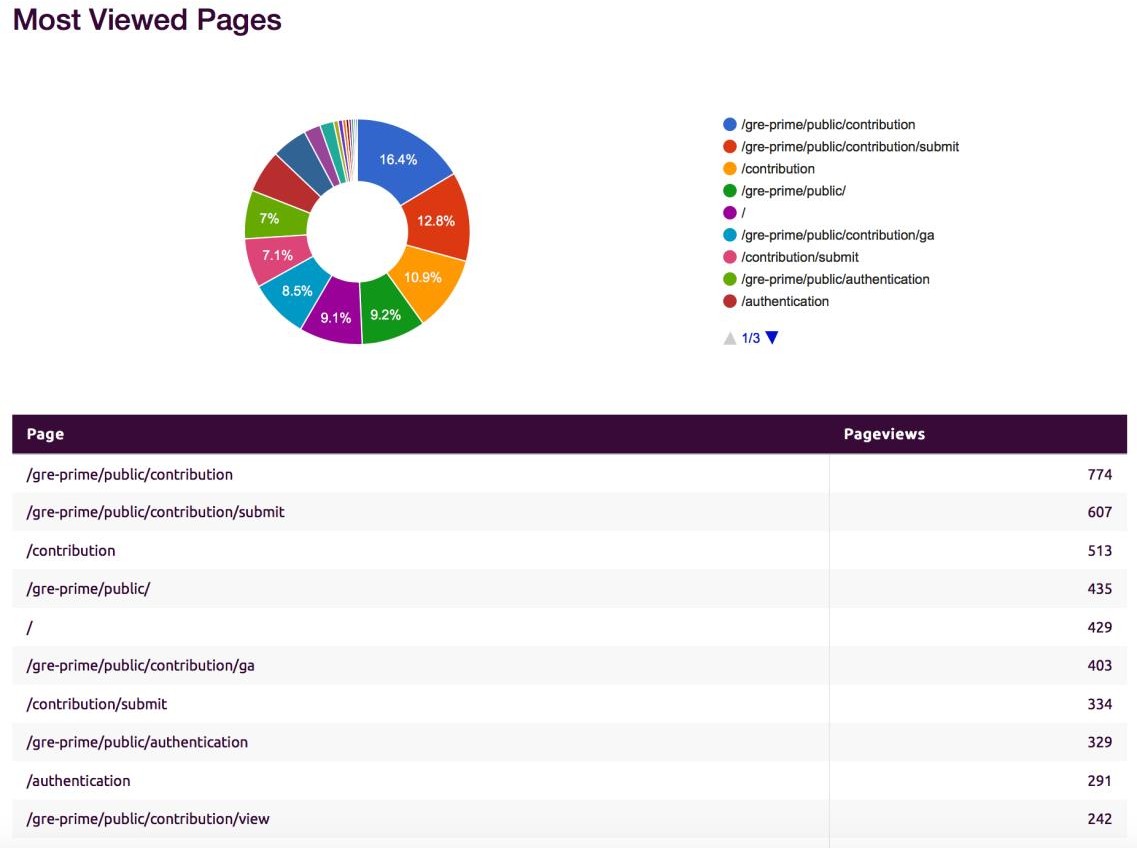


Pie chart shows the traffic on website by country

*Figure 32 Traffic from countries*

### 3. [6](mailto:ma1107w@gre.ac.uk) .6 Most Views Pages

The pie chart represents the most viewed pages of the website. Colours in pie chart represents the specific page of a website. The table below also shows the same result; it shows total number of viewing of each page instead of their percentage. The polymer element showing the results, uses ga:Pageviews as dimension and uses ga:pagepath as metrics.



A table view shows most visited pages, with page path and total numbers

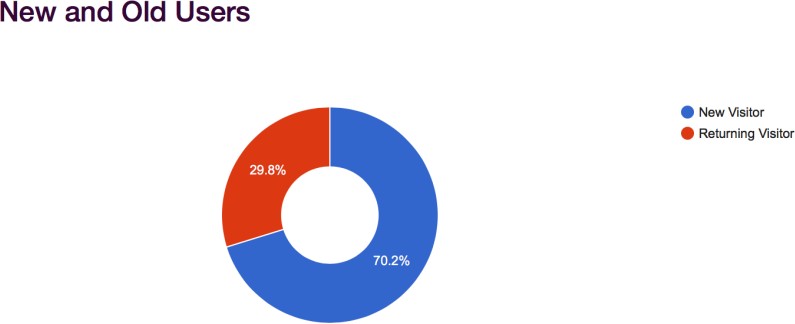
Page path with a colour which can be seen in pie chart to see the results

Pie chart to shows most visited pages and shows their percentage to easily analysis the results

*Figure 33 Most viewed pages*

### 3. [6](mailto:ma1107w@gre.ac.uk) . [7](mailto:ma1107w@gre.ac.uk) New and Old Users

User types on website can be seen below. The chart uses polymer element and the element uses google query to get data for user types. The metrics are ga: UserType.



The pie chart shows new user and old user % age report.

*Figure 34 New and old users*

## Further Developments

On reflecting on the project Team Prime discussed ways in which they could improve the system had there been more resources. One suggestion was the use of JQuery and AJAX to aid user experience - by using JQuery we could implement ‘Drag and Drop’ file transfer functionality in the system. This is an increasingly common method of submitting user generated content utilised by popular websites. Initially we attempted to implement the ‘View Feedback’ section into a Modal and populate this without the need to change or reload pages via AJAX. Unfortunately as time progressed we had to cut back on this functionality in order to ensure the stakeholder requirements were met.

## Code Snippets

Snippet #1 - Password Hashing

public function encrypt($salt) {

$password = $this->\_plain;

for ($i = 0; $i < 1000; $i ++) {

$password = sha1($salt . $password);

}

return $password;

}

public function create() {

$salt = substr(md5(uniqid(rand(), true)), 0, 8); return $salt . $this->encrypt($salt);

}

public function compare($encrypted) {

$salt = self::extractSalt($encrypted);

//encrypt user supplied plain password with known salt return $encrypted === ($salt . $this->encrypt($salt));

}

*Snippet #2 - OnBootstrap ACL Method*

public function onBootstrap(MvcEvent $e) {

$this->app = $e->getApplication();

$this->serviceManager = $this->app->getServiceManager();

// initialize ACL

$this->initAcl($e);

// Check ACL

$e->getApplication()->getEventManager()->attach('route', array($this, 'checkAcl'));

}

*Snippet #3 - Checking the MVC event against our defined ACL*

public function checkAcl(MvcEvent $e) {

$routeName = $e->getRouteMatch()->getMatchedRouteName();

$routeParams = $e->getRouteMatch()->getParams();

$routeResource = $routeName . '-' . $routeParams['action'];

$auth = $this->serviceManager->get('my\_auth\_service');

$userRole = $auth->hasIdentity() ? $auth->getIdentity()->role : 'DEFAULT';

if ($userRole != 'developer') {

if (!$e->getViewModel()->acl->hasResource($routeResource) || !$e->getViewModel()->acl-

>isAllowed($userRole, $routeResource)) {

if ($userRole != 'DEFAULT') {

$response = $e->getResponse();

$response->getHeaders()->addHeaderLine('Location', $e->getRequest()->getBaseUrl() .

'/404');

$response->setStatusCode(404);

}

}

}

*Snippet #4 - Contribution URL Routing Configuration*

'router' => array(

'routes' => array( 'contribution' => array(

'type' => 'segment', 'options' => array(

'route' => '/contribution[/:action][/:id]', 'constraints' => array(

'action' => '[a-zA-Z][a-zA-Z0-9\_-]\*', 'id' => '[0-9]+',

),

'defaults' => array(

'controller' => 'Contribution\Controller\Index', 'action' => 'index',

),

),

),

),

),

*Snippet #5 - Serving Different View Per User*

$user = $this->identity();

$view = new ViewModel(array('contributions' => $contributions, 'user' => $user));

$userRole = $this->identity()->role;

$view->setTemplate('contribution/index/dashboard/' . strtolower($userRole) . '.phtml'); return $view;

*Snippet #6 - CronTab Entry*



# Testing

To ensure the implemented features were robust, and met the client specification, testing was carried out alongside the development of the proposed application. Included in sections below are details of the elements which were tested and the results of doing so.

## Test plan

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Test**  **Number** | **Purpose** | **Process** | **Expected Result** | **Actual result** | **Pass/Fail** | **Action**  **Taken** |
| 01/03/17 | 1 | To check a student can login successfully | 1. Enter correct details provided 2. click login. | Application should allow user to access their personal account | As expected | Pass | No further action  required |
| 07/03/2017 | 2 | Verifying that pages are responsive to screen size on a desktop. | 1. Load   [www.teamprime.co.uk](http://www.teamprime.co.uk/)   1. Re-size the browser window to see if the page   scales respectively | The page elements  should adjust to fit to the new window size. | As expected | Pass | No further action required |
| 30/03/2017 | 3 | To check if the administrator can log in | 1. Enter correct details provided 2. click login. | Application should allow the admin to access their personal account where they  can maintain the system | As expected | Pass | No further action  required |
| 30/03/17 | 4 | Verify timestamp for the last login time, for the user logged in | 1. Enter correct credentials, as any user 2. check if last log in time is accurate and is displayed | Application will display the time and date the user was last logged into the system | As expected | Pass | No further action required |
| 03/04/17 | 5 | Verify that a contribution cannot be added without first agreeing to the terms and condition | 1. Log in as student 2. Do not agree to terms and conditions 3. Attempt to add a   contribution | An error message should be displayed, and the article shouldn’t be added. | Contributions can be added without agreeing to  T&Cs | FAIL | Discuss with developers |
| 02/04/17 | 6 | Confirm student can upload a magazine article | 1.Login as student 2.Agree to terms and conditions  3.upload a document for  approval | Application should allow the user to upload a Word document as their contribution | As Expected | Pass | No further action required |
| 04/04/17 | 7 | Verify if a student can upload multiple image as part of their contribution | 1.Login as student 2.upload a document for approval   1. Add an image to upload 2. upload second image | Application should allow students to upload 1 or more images as part of their contribution. The image upload form should clear, after the first image has been  uploaded | Only allows one image to be uploaded | FAIL | Discuss with developers |
| 02/04/17 | 8 | To check if a student can view all their previous uploads | 1. Login as student 2. check the “dashboard” | The MMS should show all the user’s previous uploads | As Expected | Pass | No further action  required |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 04/04/17 | 9 | Verify the student can modify a contribution | 1. Login as student 2. select a contribution from the “dashboard” 3. Modify title 4. click update | When update has been clicked, the title should be changed to the new value. | Did not meet requirements | FAIL | Discuss with developers |
| 04/04/17 | 10 | To check if a student can delete a contribution they have made | 1. Login as student 2. Select a contribution from the “dashboard” 3. Click delete | When the delete button has been clicked for the selected contribution, the article should be no longer accessible. | No delete button, cannot delete | FAIL | Discuss with developers |
| 01/04/17 | 11 | Verify that a marketing coordinator can view all contributions for their faculty | 1. Login as marketing coordinator 2. Select “dashboard” 3. iew all contributions | When the “dashboard” is selected, all contributions belonging to the marketing coordinator’s faculty should be visible. | As expected | Pass | No further action required |
| 04/04/17 | 12 | Check if marketing coordinator can provide feedback for a magazine article | 1. Login as Marketing Coordinator 2. Select “dashboard” 3.view all contributions 4.select a contribution and   provide a comment, mark as  approved. Click update | When update is clicked, the comment and status change will be visible to the user who uploaded the article in their “dashboard” and if approved, also to the Marketing Manager | Unable to add comments or change status | FAIL | Discuss with developers |
| 04/04/17 | 13 | Verify that marketing Manager can view all contributions made within the MMS | 1.Login as Marketing Manager 2.Select “dashboard”  3.view all contributions | When the dashboard is accessed, user will be able to view all contributions by students, belonging to all faculties | As Expected | Pass | No further action required |
| 04/04/17 | 14 | Check if Marketing Manager can flag errors on contributions | 1.Login as Marketing Manager 2.Select “dashboard”  3.view all contributions 4.Select contribution, highlight issue  5.click notify | When the “notify” button is clicked, the issues highlighted will be passed on to the Marketing coordinator | Can’t view student’s  contributions, therefore cannot flag errors | FAIL | Discuss with developers |
| 04/04/17 | 15 | Verify that Marketing Manager can download all contributions | 1.Login as Marketing Manager 2.Select “dashboard”  3.view all contributions 4.download all contributions | When “download all” is clicked all contributions should be downloaded in a zip file | Individual files can be downloaded, not all at once within a zip file. | FAIL | Discuss with developers |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 04/04/17 | 16 | Test if the Marketing manager has access to statistical data regarding submitted  contributions | 1.Login as Marketing Manager 2.Select “dashboard”  3.view statistical data | When the dashboard is accessed, the user will be able to see how many contributions have been made per faculty | As expected | Pass | No further action required |
| 04/04/17 | 17 | Check if Marketing manager can view all approved contributions | 1.Login as Marketing Manager 2.Select “dashboard”  3. view all approved contributions | When the Marketing Manager accesses the “dashboard”, all approved contributions will be visible | As expected | Pass | No further action required |
| 04/04/17 | 18 | Verify Admin can modify existing user accounts | 1.Login as Marketing Manager 2.Select “dashboard”  3.Select user 4.Edit last name  5.click update | After “update” is clicked, the last name change will be visible to the User as well as the Admin, when the account is viewed | Functionality not implemented | FAIL | Discuss with developers |
| 04/04/17 | 19 | Check that Admin can create accounts | 1.Login as Marketing Manager 2.Select “dashboard”   1. Select create user 2. Fill out details, click “create” | When “create” is clicked the user will be added to the database, and therefore will be able to log in using the details provided at creation | Functionality not implemented | FAIL | Discuss with developers |
| 04/04/17 | 20 | Verify guest account can log in and view contributions | 1. Login using guest account 2. View contributions | The application will allow access to the guest user and allow them to view contributions  from their faculty. | As expected | Pass | No further action  required |
| 06/04/17 | 21 | Verify application is responsive on a small screen device | 1. Load   [www.teamprime.co.uk](http://www.teamprime.co.uk/) on mobile phone Verify screen components scale and fit to the screen   1. Log in as student 2. Verify dashboard adequately scales | The MMS homepage should scale and fit to the smaller screened device, all the home screen icons, images and menus should scale and fit the screen. In addition, the student user should be able to view and use the dashboard, without having to zoom in to make use of the features. | As Expected – tested with a 5.5inch size screen (1920x1080). | Pass | No further action required |
| 06/04/17 | 22 | Verify application is responsive on a tablet device | 1. Load [www.teamprime.co.uk](http://www.teamprime.co.uk/) on a tablet PC 2. Log in as student   Verify dashboard adequately scales | The MMS homepage should scale and fit to  tablet’s screen size, all the home screen icons, images and menus should scale and fit the screen. In addition, the student user should be able to view and use the dashboard, without having to zoom in to make use of the features. | As Expected – a tablet with a 9.7inch screen was used. The screen was big enough so the full site fit and was fully  functional. | Pass | No Further Action required |

* 1. Scope

Functional requirements essential the application will be tested. These are derived from the client’s requirements and also from the user stories. Included in section 4.3.1 is a test log, defining all features which will tested during the development phase, these are critical meeting the client requirements.

* + 1. Test Log

|  |  |
| --- | --- |
| **Student functionalities** | |
| **Feature** | **Description** |
| Uploading an article | User can upload a file as a word document |
| Attach multiple images | User should be able to upload images to their article |
| View Contributions | User should be able to check their current uploads |
| Login facility | User must be able login into system |
| Logout facility | User can logout of the system. |
| Update a contribution | User should be able to edit their uploaded contributions. |
| Delete a contribution | User can delete their contribution |
| Must agree to terms and conditions agreement | Users would need to agree to terms and conditions before they can submit a contribution |
| **Marketing Coordinator** | |
| **Feature** | **Description** |
| View all contributions from their faculty. | User should be able to view their student’s articles. |
| Provide feedback on an article | User should be able to provide a feedback comment on a magazine contributions, for students in their faculty |

|  |  |
| --- | --- |
| **Marketing Manager** | |
| **Feature** | **Description** |
| Visibility of each faculty’s contributions | User can view all submitted contributions, for all faculties |
| Flag errors on contributions | User has the ability to notify marketing coordinator if errors are spotted on a contribution |
| Download all contributions | User should be able to download all submitted contributions in a zip file |
| Statistics of submitted contributions | User has access to statistical data, depicting the total contributions for each department |
| View approved contributions | User requires the ability to review all contributions for each department that have been approved by their faculty. |
| **Admin** | |
| **Feature** | **Description** |
| User Management | User must be able to modify existing user accounts as well create new ones. |
| System Management | User requires the ability to manage academic year dates, adding new years as needed. |
| **Guest** | |
| **Feature** | **Description** |
| Log in | User would first need to authenticate. |
| Log out | The sessions should be killed upon logging out. |
| View contributions for their respective faculty | User should be able to view all contributions for the faculty. |
| **General website features** | |
| Website responsiveness | Website can adapt to a suitable layout on different screen sizes. |

## Sufficient Data to Fully Test

In order to thoroughly test the final product, and the functionalities which had been implemented, the database was populated with over 400 magazine contributions, each belonging to one of 200 users. Guest accounts were also generated to demonstrate that they could view contributions submitted by members of their faculty – one for each faculty. In addition, roles were assigned to each of the generated users, to test their assigned privileges e.g. the administrator account is able to view statistical information on their dashboard, as opposed to a student who can access the submission form and view their previous contributions from theirs. As well as ensuring various functionalities could be tested, the use of generated data also enabled the analysis of how well the system would perform as the data sets begin to grow in size.

Below demonstrates a few examples of how huge amounts of data has been taken into consideration by having several different accounts for each type of user. These accounts listed below are fully functioning on our website ([www.teamprime.co.uk](http://www.teamprime.co.uk/)). For demonstration purposes, the passwords have all been set to “test”, however when being stored within the database, there is still that element of high level security present. In addition, only a few examples of different roles are presented within this table to also demonstrate meeting client requirements and user stories.

|  |  |  |
| --- | --- | --- |
| Roles | Username | Password |
| Marketing Manager | [Marketing-manager@a.com](mailto:Marketing-manager@a.com) | test |
| Marketing Coordinator - Law | [Marketing-coordinatorLaw@a.com](mailto:Marketing-coordinatorLaw@a.com) | test |
| Marketing Coordinator - Engineering | [Marketing-coordinatorEng@a.com](mailto:Marketing-coordinatorEng@a.com) | test |
| Marketing Coordinator - Architecture | [Marketing-coordinatorArc@a.com](mailto:Marketing-coordinatorArc@a.com) | test |
| Student – Law | [emmap@a.com](mailto:emmap@a.com) | test |
| Student – Engineering | [norman@a.com](mailto:norman@a.com) | test |
| Student - Architecture | [cursus@a.com](mailto:cursus@a.com) | test |
| Guest – Law | [Guest-law@a.com](mailto:Guest-law@a.com) | test |
| Guest – Engineering | [Guest-Engineer@a.com](mailto:Guest-Engineer@a.com) | test |
| Guest - Architecture | [Guest-Archtiecture@a.com](mailto:Guest-Archtiecture@a.com) | test |
| Admin | [a@a.com](mailto:a@a.com) | test |

# Agile Methods Followed

## Zen hub

The team used ZenHub, an extension of GitHub to create the scrum tools and workflow needed for the agile

development of the application. Using ZenHub we were able to create issues as user stories as part of larger ‘Epics’ and add user stories to milestones which functioned as agile sprints. By using the ticketing system the team was able to monitor its progress using burn-down charts and Kanban boards.

## Development tools and workflow

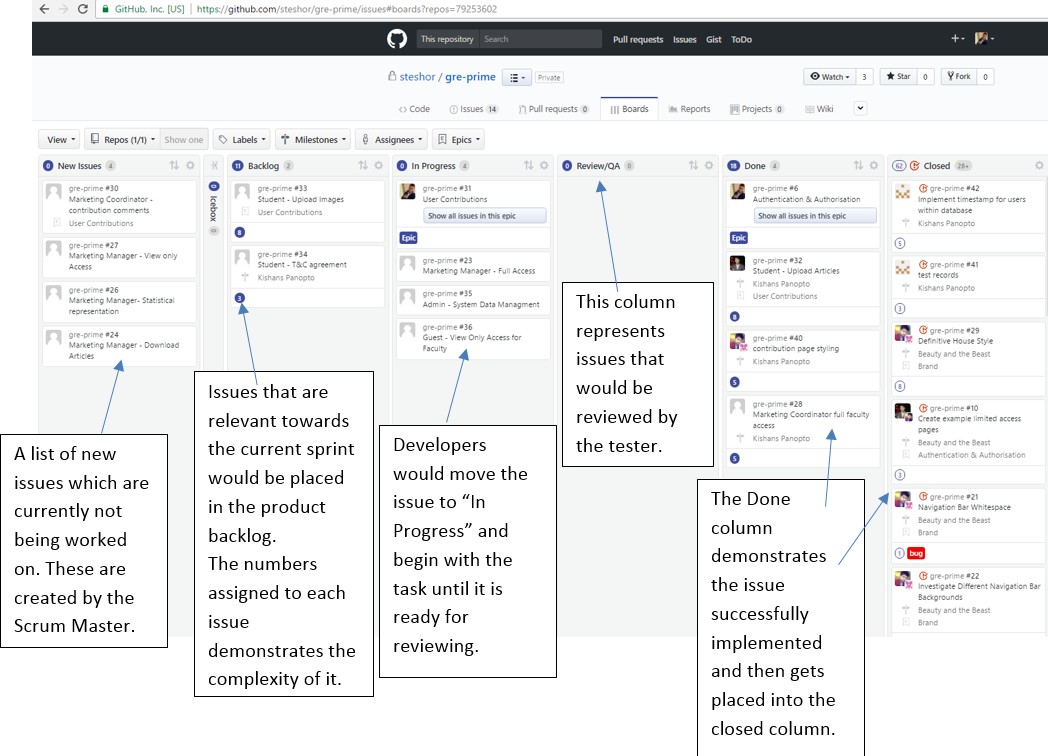
During the development process we created an Amazon Machine Image (AMI) snapshot which contained the various dependencies needed to run our project. With this image we could then spin up, on-demand, EC2 instances running our latest codebase from GitHub enabling us each to have our own fresh development machine within minutes. This sort of tooling enabled us to collaborate better as we would not be overwriting each other’s work and the projects development was not dependent on the various system setups of our own personal machines. In an enterprise environment this process could help us scale to thousands of users by elastically spinning up new instances as demand requires.

The team utilised GitHub during the development process and put in place a robust policy to provide a framework for collaboration. Each team members contributions to the repository needed to have their own branch in which they would commit any work to, this would be described with the issue number inside of the commit message. Once the work is done it would be rebased against master to ensure that team member’s work is replayed on top of any other team members’ work and then a pull request would be created. A tester reviews the pull request and code changes and then if approved the feature branch will be merged into the master branch.

## Sprints

Sprints were created by the product owner (Stephen) and coordinated by the scrum master (Kishan), to ensure deadlines are met within a set duration period. The sprints were prolonged over two weeks whereby the development team agreed upon what was required during that time to ensure a sufficient workload was set and achievable. During each sprint, weekly meetings were organised by the scrum master (Kishan) to discuss progress and brainstorm possible solutions for any issues arisen. After the 2 week period, a sprint review was done to reflect on the sprint process and how effective did the team work together. In addition, the prototype was demonstrated to the rest of the team after each sprint, which aided in the decision process of what was achievable for the next sprint and the process of it can be done.

Using the Kanban board, the development team are visually aware of issues created from the scrum master whereby each issue has been set to a specific sprint and also assigned to appropriate team members. Based on the current sprint, the relevant issues would be placed within the product backlog whereby the assigned individual(s) would move the issue to “In Progress”. Once completed the issues are then sent for reviewing, which in turn would allow the tester(s) to test the functionality created and report back to the developers if any issues have occurred. This agile process works well to continuously review every aspect of the website to ensure a fully functional product is provided, which is demonstrated in figure 35.



*Figure 35 - Kanban Board*

## Burndown Charts

Throughout our development cycle, the use of burndown charts played an important role when working together in an environment similar to agile development. The burndown charts provided a graphical representation of how our team were performing throughout the sprint. As each sprint was set to fortnight duration, each graph shows a timeline of how quickly the team have burned through the user stories. This is displayed on the X-axis of the graph.

Each burndown chart is based of sprints that were created throughout the implementation of our website. As mentioned before, each sprint has a set number of issues assigned to it.

Each issue has an appropriate story point assigned to it, which clearly identifies its level of complexity. The higher the number, the more complex the issue is. These story points, are excellent indicators to show which issues are most difficult and which issues would require more attention to it. By doing so, aids the development cycle thoroughly to ensure issues are dealt with within the set timeframe and also helps us as a team achieve more when meeting set deadlines. The Y-axis of the graph indicates the total number of the story points for that sprint.

When moving issues from ‘In Progress’ to ‘Done’ to ‘Closed’ on the Kanban board, this dynamically is altered on the chart and notifies the developers which issues are remaining and which are completed. Also as each issue is assigned a story point, the velocity of the graph will change accordingly based on the value of the issue.

The new updated graph would then indicate what work was done on each iteration, the work that’s remaining, and when it can be expected to be completed.

These charts were extremely useful as they:

* Made the reality of the project clearer
* Indicated the team if issues had arisen and things weren’t going to plan
* Prevented wishful thinking, and helped created more realistic judgements (AgileNutshell, 2017)

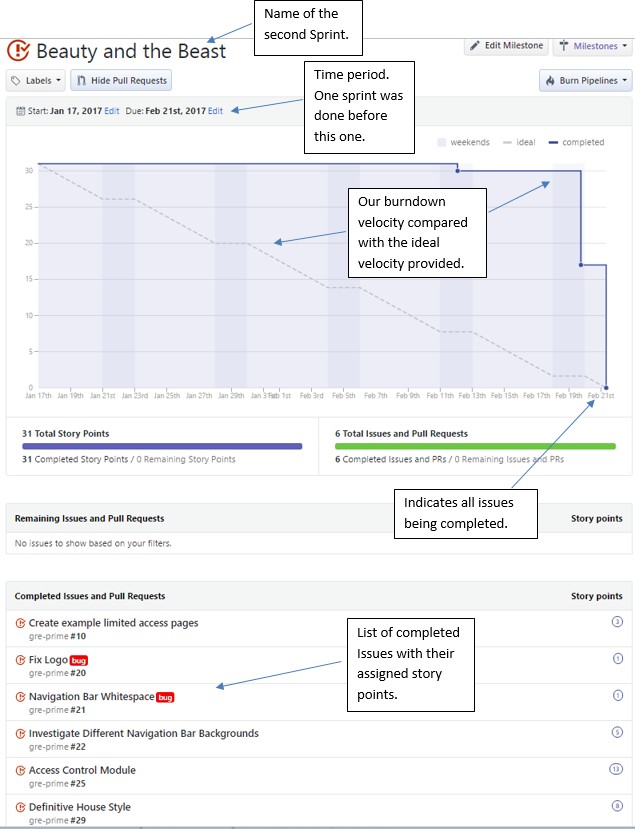
Figure 36 displays our most up-to-date Sprint. It demonstrates a chart that shows some issues being completed and some still yet to be finished. There is a duration period shown, alongside a value of all the story points added together to indicate where the sprint beings.

Figure 37 shows our second sprint undertaken. Demonstrated are the all issues being completed within the sprint period therefore indicating a successful performance from the team to ensure all set user stories were burned within the fortnight.

Figure 38 displays our first sprint completed. It had the same outcome as figure 37.



*Figure 36 – Our most up-to-date Sprint with a visual representation of its burndown chart*



*Figure 37– Our second sprint alongside its burndown chart*



*Figure 38– our first Sprint alongside demonstrating its burndown chart.*

## Minutes of Meetings

|  |  |  |  |
| --- | --- | --- | --- |
| Meeting Date: | What was discussed? | What was finalised? | Attendance |
| 17/1/2017  3pm-4pm | * Discussed Roles * Agreed to use GitHub for code repository * Agreed to use ZenHub for Kanban board * Agreed to use google docs for tracking documents and collaboration * Kishan setup WhatsApp group for team communication * Kishan (Scrum Master) Emailed Ray (Course Lecturer) informing him of everyone's roles. | Roles were assigned to each member within the group.  Also finalised the tools that are going to be used for this coursework, with the addition of a WhatsApp group being created for constant communication within the team. | Kishan Patel Abrar Anwar Noor Alam Ali Yalkic  Stephen Short Eval Thompson |
| 24/1/2017  3pm-4pm | * Discussion on creating a master table for user accounts for the ERD diagram * Creation of epic brand for house style * Discussed and agreed to having a sprint duration of 2 weeks, with understanding of what is required to go into a sprint. * User stories were mentioned to provide a better understanding of specification. * Create design document for website | Ali to create master table for user accounts, and also to complete a first draft of an ERD diagram.  Abrar, and Noor (as both web designers), to create wireframes of potential site and create a brand name which are included within the design document.  Kishan to complete user stories  Stephen to create logs for sprints. | Kishan Patel Abrar Anwar Ali Yalkic Stephen Short  Eval Thompson |
| 31/1/2017  3pm-4pm | * Presented and provided feedback on each other’s work * Client Questions were asked which later led to creating some assumptions for our coursework. * First draft of database design needed some minor improvements * Discussion of better colour schemes and more | Kishan to put user stories into product backlog and also create a document of all client questions asked. Also creating a list of assumptions that can be made.  Abrar, and noor to complete design documentation  Stephen to carry on developing the system | Kishan Patel Abrar Anwar Noor Alam Ali Yalkic  Stephen Short |

|  |  |  |  |
| --- | --- | --- | --- |
|  | wireframe development for other pages. | Ali to improve database design  Eval to test development of system step by step as implementation continues. |  |
| 07/2/2017  3pm-4pm | * Provided feedback on progress made on each other’s work. * Discussion was carried out to understand how to use our repositories better and to ensure all issues are correctly being assigned and handled on GitHub. * This led to creating more work for everyone to do for the following week. | Change logo Change colours of webpage  Create a generic house style that would best suit the website.  Eval to test any issues which need reviewing and then closing them off, to ensure the burndown chart is kept up-to-date.  Kishan to create new issues for the 2nd sprint. | Kishan Patel Abrar Anwar Noor Alam Ali Yalkic  Stephen Short Eval Thompson |
| 14/2/2017  3pm-4pm | * Meeting began by displaying progress made from the set tasks from the previous meeting. * Discussion on how to continue development of other webpages alongside what the layout could potentially look like. * New issues were added on the repository for the burndown chart. * Kishan to create an example screencast on current wireframes and upload it for feedback. | Ali implementing image table and creating constraints for contributions table.  Eval to continue with testing anything that is within the review column.  Web designers to create wireframes for other pages.  Stephen to carry on with implementation.  Kishan will create new issues if needed for the burndown chart, and also do a test screencast for the current website. | Kishan Patel Abrar Anwar Ali Yalkic  Eval Thompson |
| 21/2/2017  3pm-4pm | Showed feedback on current progress made on work.  Discussion on merging web designers test functionality and pages with the main server to ensure the programmer has the most up-to-date version.  Discussion on creating test data for each table on the database.  Discussion on ideas and what would be ideal for our new sprint which has a duration of 2 weeks. | Eval to create a test document and to test issues that are currently placed for review.  Kishan to create a new milestone and add new issues for the 3rd sprint for the web designers and the programmer to start on.  Stephen to begin programming the student’s features on the webpage. | Kishan Patel Abrar Anwar Noor Alam Ali Yalkic  Stephen Short Eval Thompson |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Discussion on developing a test plan. | Noor and Abrar to begin creating more wireframes for the marketing coordinator functionality and also amend current wireframes based on feedback provided.  Ali to create test/dummy data for each table to ensure the database is correct and functioning. |  |
| 28/2/2017  3pm-4pm | * Displaying all progress made from last meeting * Scrum Master and Product Owner checking up on all group members current progress and providing help if required. * Combining the functionality and the current designs onto one main server * Discussion on new requirements provided * Discussion on screen panopto for displaying the team’s repositories. | Ali and Kishan to help with testing to ensure it is up-to- date  Noor and Abrar to create different layouts for individual role functions  Stephen to provide a framework to allow web developers to do so. This will help with progress on implementation.  Kishan to add new issues onto GitHub, as new requirements were provided.  Kishan to do the screencast for the team repositories. | Kishan Patel Abrar Anwar Ali Yalkic Stephen Short  Eval Thompson |
| 07/3/2017  3pm-4pm | Discussion was based around current progress made.  Discussed issues with functionality.  Discussion on how to prepare for final report upload  Discussion on how to achieve testing for current functionality | Stephen to work on displaying all contributions on website and then work on another user’s functionality.  Ali and Kishan to continue testing on functionality achieved  Noor and Abrar to work together on google Analytics | Kishan Patel Abrar Anwar Ali Yalkic Stephen Short |
| 14/3/2017  3pm-4pm | Discussion on improving Google Analytics viewing, and how to embed it within our website.  Discussion on ensuring the main database is coherent with both web | Kishan to organise repositories for a more presentable structure to prepare for the final group upload  Abrar to strengthen statistical representation | Kishan Patel Abrar Anwar Ali Yalkic Stephen Short Noor Alam |

|  |  |  |  |
| --- | --- | --- | --- |
|  | developers and programmer’s code when implementing functionality.  Discussion on repository organisation | and implement its use within our website  Stephen to continue with development and work alongside both Abrar and Ali to ensure functionality achieved matches database design as well as website architecture. |  |
| 21/3/2017  3pm-4pm | Discussion on current progress made with user functionality  The team collaborated together to ensure the programmer has enough support from both web developers and the database designer for a smoother process when developing functionality. | Kishan and Ali to continue testing on student functionality achieved.  Ali to replicate field and column names from prime database to teamprime database. In addition to altering relationships between tables. | Kishan Patel Abrar Anwar Ali Yalkic Stephen Short Noor Alam |
|  | Testing was discussed and ideas were generated with time management alongside additional workload. | Stephen to work on another user’s functionality  Noor and Abrar to continue with strengthening the website architecture. |  |
| 28/3/2017  3pm-4pm | Discussion on completing Google Analytics functionality.  Kishan and Ali to collaboratively work together on creating the group presentation | Abrar to assist Stephen in developing further webpages and more functionality.  Abrar to work on google analytics functionality. | Kishan Patel Abrar Anwar Ali Yalkic Stephen Short Noor Alam |
|  | Discussion on approaching the final group report, and how to combine all our work efficiently. | Kishan to begin gathering slides and creating a plan for the presentation and also work alongside Ali to continue with testing. |  |
|  |  | Kishan to collaborate with other group members to work on the report. |  |

* 1. User Stories

As a Marketing Manager, I would require access to all selected contributions to view the finalised articles for the magazine that each Marketing Co-ordinator have put forward for their faculty.

As a Marketing Manager I want to download all selected contributions in a ZIP format after the final closure date, so that the information is easily retrievable in order to submit for publication.

As a Marketing Manager I would like a statistical representation of all contributions provided from each faculty to ensure they are all providing a suitable amount of contributions for the magazine before the closure date.

As a Marketing Manager I would require a view only access of the whole system, to make sure everything runs smoothly up to the final closure date. In addition, I can take action if an error was spotted by notifying the marketing coordinator.

As a Marketing Coordinator I would require access to all student contributions within my faculty, because I want to review what has been submitted.

As a Marketing Coordinator, I want to be able to provide comments on my students’ contributions within a time period of 14 days because I want them to update/ edit their work before the final deadline.

As a Student I should be able to upload an article as a Word doc because if my Marketing Coordinator provided me feedback, I should be able to update/edit my contribution.

As a Student I should be able to upload high quality images as part of my contribution because it would make my article stand out and look more representable for a university magazine.

As a Student, I must be able to agree to the University terms and conditions, otherwise I cannot provide a contribution.

As an Admin I want to manage the system data such as user accounts, and important dates for academic year, so I can keep system contents up-to-date.

As an Admin, it is essential that I can view reports that provide a statistical display for which pages are most viewed, which users are most active and which browsers are being used because it provides an overview of user interaction on the website.

As a Guest I want to view all selected reports and view all statistical data for my faculty so I can find out what students have written for the university magazine.

As a user regardless of my of role I want to peace of mind to know that my account is as secure as possible, and know when my account was last accessed.

# Screencast and Presentation

## Presentation:

Our presentation was demonstrated at a professional standard. Prezi was used to demonstrate our presentation because it provides a more dynamic and captivating appeal towards our product. As slides swiftly move from one another with fluidity, it’s more impressive than the functions provided from PowerPoint (Sutton, 2014). Henceforth, with strong fluidity and displays of more visually compelling presentations that suit the current digital age, Prezi was chosen as the main software for our presentation.

The presentation gave a full insight into the depths of our product whereby each team member had thoroughly explained a unique aspect of our website.

The presentation was pitched at a non-technical level and was focused around several key areas. Areas included:

* Accessibility/Usability (Kishan)
* Maintainability (Stephen/ Ali)
* Product Overview (Stephen)
* Security (Kishan)
* Professional House style consistency (Noor)
* Website Design (Abrar)
* Real Time statistics (Abrar/ Ali) Links to presentation:

<https://prezi.com/mlu9cdgeegn0/mms/?utm_campaign=share&utm_medium=copy>

<https://gre.cloud.panopto.eu/Panopto/Pages/Embed.aspx?id=42fcbe3c-8919-4a65-8ae2-14c40ff8a9de>

## Screencast

The screencast provided demonstrates a full in-depth audio narration of the functionality achieved by our team. The flow of the presentation was specifically organised based on the site map, to ensure best usability and accessibility practices.

This screencast was created by the scrum master who has been constantly following the development of the product from its initial stages. The scrum master was also accountable for previous screencasts that have occurred throughout the project development cycle.

Screencast Link:

<https://gre.cloud.panopto.eu/Panopto/Pages/Viewer.aspx?id=7b53a59e-f410-433b-a11a-f753505ebb20>

# Conclusion

During the course of developing the product the team worked like an enterprise software development team, using agile techniques and tools to ensure the lean delivery of the product. In doing so the team delivers an enterprise- ready application that not only caters to the stakeholders’ initial specifications but exceeds in areas of security, robustness and scalability. To conclude, based on above mentioned factors, team prime has developed a secure, maintainable, efficient, portable, scalable magazine management system that satisfies all stakeholders’ requirements.

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