Development of a web based social & professional service platform for athletes

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The Internet has evolved the traditional business model to a new platform known as e-business. Due to reason of the quick stream of information via web the concept has gained popularity over the years. Selecting an e-business platform has become a standard practice among corporations and individuals. Gameday Footage utilizes the e-business concept which permits the professional athlete to telecast their career and portfolio via the Internet.

The following archive reflects on the process of research & development of a web-solution for Gameday Footage. The project was processed by taking qualitative methods into account. The development of the web-solution proceeded by adopting Rapid application development and a number of prototypes were produced and evaluated. Several technologies such as client & server side scripting, cloud computing and content management system were involved. Please do note that the following archive will not encase any precise configurations of technologies involved in the development. This archive has six parts which will stroll through the procedure of innovative work.

The project ended by providing a quality solution which meets the coveted usefulness and the modern web standards. When of composing this archive Gameday Footage was operational and offering its services globally by means of the web.

Gamedayfootage, web platform, social media, video stream, e-business

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Terms used

GDF	Abbreviate for Gameday Footage
E-business	Electronic Business
UI/UX	User Interface / User Experience
QRCA	Qualitative Research Consultants Association
RAD	Rapid Application Development
UAC	User Access Control
ITRC	Interstate Technology & Regulatory Council
GUI	Graphical User Interface

Introduction

Over the previous decade, the web has majorly affected the concept of computing and data communication. It has totally changed the conventional techniques for communication and data sharing. Web having the capability of fast flow of the information and breaking down the geological limits it has brought up several new concepts, such as "Electronic Business". An e-business is an advanced business concept, it incorporates the purchasing or offering of any items or services electronically. This platform may include trade of electronic or non-electronic services as well. Being an inexpensive method of commerce, marketing, customer relationship and even human resource management the e-business has turned into an essential platform for any small to large business enterprise (Importance of e-business 2015). Any e-business requires a scalable solution which can be accessed via the web and it can address its specific needs. Following websites are enriched with advance features such as content delivery, process execution or even an application being utilized via the web. These advance and customized websites are known as web solution (MET Design 2008).

According to (Statista 2015), over 1 billion Internet users, which is 40 percent of aggregate internet users have used an e-business. This number is persistently developing, a comparable statistic published on (Statista 2015) indicates just in 2011 there were 792.6 million digital buyers. Later in 2012 the figure had an increment of 111.6 million and by 2017 it is anticipated to be 46.4% percent of aggregate Internet users (Figure 1).
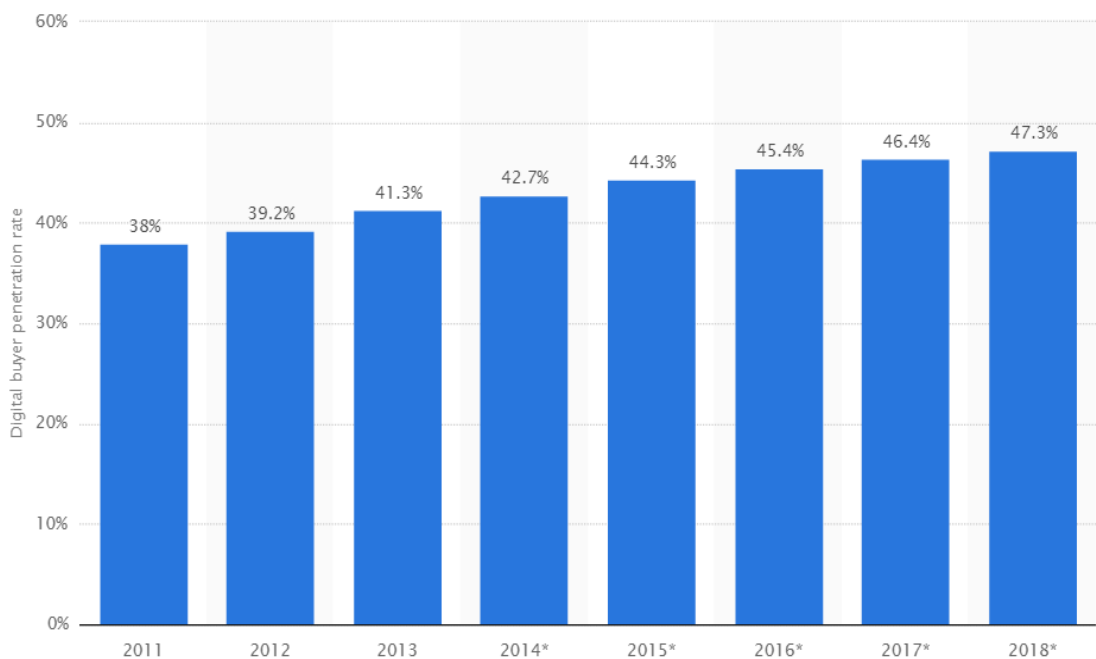

Figure 1: Info Graph by Statista for digital buyer 2011-2018

1.1   Company background

Bbased in Bakersfield, United states the Gameday Footage is a sport merchandising company which is being controlled by a group of athletes from everywhere throughout the globe. Initially a group of professional athletes playing abroad thought of a platform which can be used for broadcasting their careers internationally. Right on time in 2015 the thoughts were planned as an appropriate business model and trademark was registered.

By the time of composing the following archive Gameday Footage offers various paid and unpaid services, which incorporate video streaming, social media, profile promotion, talent scouting, and affiliation rewards for all of its registered athletes and many other registered customers. Registered user can subscribe and follow any athlete featured on GDF network, this incorporates their career updates and recorded games as well. Furthermore GDF also offers news feed which is comprised of several sources from the sports world. This platform allows the athletes to display their talents to selection representatives and permits for their fans to follow as well.

1.2   Project introduction

The management at Gameday Footage required a web based platform which not just satisfies their business necessities and quality standards, but also fits in their characterized spending plan. After consulting and looking into accessible web platforms, it was comprehended by the GDF management they are in need of a custom build web platform which can provide their desired functionality. The management acquired a group of developers for the development of the web platform. Please do note that at this stage Gameday Footage had no existing web platform for offering its services and the author played a main role in the process of development.

1.3   Project objectives

The primary objective of the project is to develop a web based platform which can give coveted usefulness. The end product must meet the modern web standards in terms of UX (User experience), functionality and the security. To do as such, a sharp comprehension of several aspects involved in the model must be tended to. A starting objective is to comprehend the very specifics of the client's business model, doing that will require the best practices of service design principles. Furthermore, breaking down the service model will uncover the vital aspects of service model.

Social media

This will allow the athletes or users to build their profiles on GDF network. Keeping a note that, there will be several types of users using the network. Each user type will have a distinctive set of functionality for e.g. athletes must have a portfolio option and the permit for uploading videos. In order to comprehend with the user roles and capabilities, please consult the section 4.3.1 Use Casing UAS.

Video streaming

The platform must have potential of video streaming, this will allow the athletes to broadcast their recorded games for selection representatives and their fans.

Affiliate program

A separate section for affiliate partners should be in place and it must allow the GDF administration to keep track of affiliates in real time. The affiliate users must be approved manually by the management.

Subscription levels

The platform must have the potential of offering multiple levels of subscriptions for its viewers. The subscription levels are classified based on duration and price. The management should have the privilege of changing these subscription levels according to their plan. Viewers will subscribe using online payment methods.

News Feed

A news section which displays events & news, this section must have the capability of custom publications organized by the contributors. The following section must be visible to any viewer visiting the site. Publishing contents categorical is a must have funtion.

Security

As banking system and online payment methods are involved GDF management has major concerns on the matter of security. Furthermore, in case of any incident the management must have the potential of tracking back any occurred events.

Project achievement assessment will base on coveted usefulness, staying within the characterized expenditure plan and delivering the end product before the defined deadline.

1.4   Limitations

The following archive will elaborate on the development process of the web platform designed for Gameday Footage. Considering the efforts to establish the security measures of the business this document will not encase any precise configurations of technologies included within the plan of action. As mentioned earlier GDF is being controlled by a group of athletes who have a limited knowledge of the technology, occasionally it was a challenge to develop a common comprehension on few matters. This had a strong impact on the selection criteria of content management system (CMS).

A limited time allotment was defined for the development of the web platform, the GDF management demanded for an additional set of functionalities which were not initially planned. This imposed additional efforts with the process of development. As the working colleagues were in remote locations the geological and time zone contrasts among the individuals had a minor impact.

Once the final product is launched a proper training is required for the handling and managing it. GDF management did not schedule any training for their staffs until certain type of issues were raised. These issues could have been avoided if a training period was organized in advance.

2   Methodology

The undertaking of the following project proceeded by taking a qualitative research approach into account. As indicated by (QRCA 2015), in order for in-depth exploration of the vital aspects involved in any model, the qualitative research approach can enlighten the strengths and the weaknesses which can accelerate the decision dynamics. Section 2.3 Research methods will further elaborate on the methods adopted within the process.

2.1   Research approach

The project presented a practical problem and concerning the complexity of the project, the constructive research approach was an ideal selection. According to (Pasian, 2015.) The method serves the dual aim creating a bridge between practical relevance and theoretical concepts and providing novel arrangement. Please view figure 2 for visual comprehension.
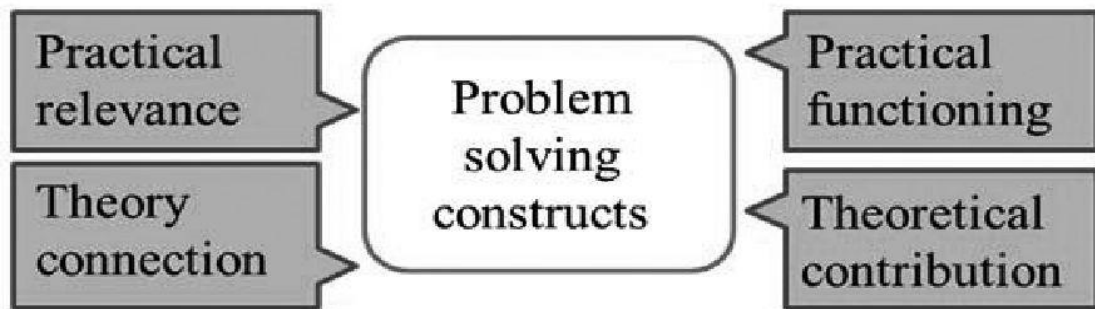
Figure 2: Constructive research elements (Adapted from Kasanen 1993).

2.2 Development process

The development process was administrated by using Rapid application development (RAD) technique. According to (John Watkins 2009), the RAD was developed in 1980 by James Martin and the process is known for quick production of high quality products. The Idea driving RAD utilizes a constructive approach, data is gathered by collaborative workshops and prototypes are developed. These prototypes are incremented and re-engineered throughout the development process until a final product is delivered. Compared to the waterfall development model which draws in extensive level of a planning, RAD does not require an extensive level of planning but focuses on the production of prototypes.

RAD methodology is sectioned into four particular stages. Stage one is known as Requirement & planning phase the Stakeholder, IT staff, system users and managers collaborates in a workshop which is exercised to identify the very specifics of the project such as business demand, necessities, scope and any obstacles. Phase two known as user design phase, a prototype is developed which incorporated all the system elements required for user interaction. The process is collaboratively engaged with the system users. The Construction phase is known as the third stage of the RAD model. The accompanying stage focusing on the core structure of the system and the vital backstage elements of the system are developed. During the process the users are being monitored and the data gathered is used for re-engineering the existing prototype. The final phase of RAD is known as cutover phase, which emphasizes on the implementation process. The re-engineered version of the prototype is used to finalize the end solution by testing and evaluating several critical aspects. Figure 3 represents a visual illustration of the RAD model.
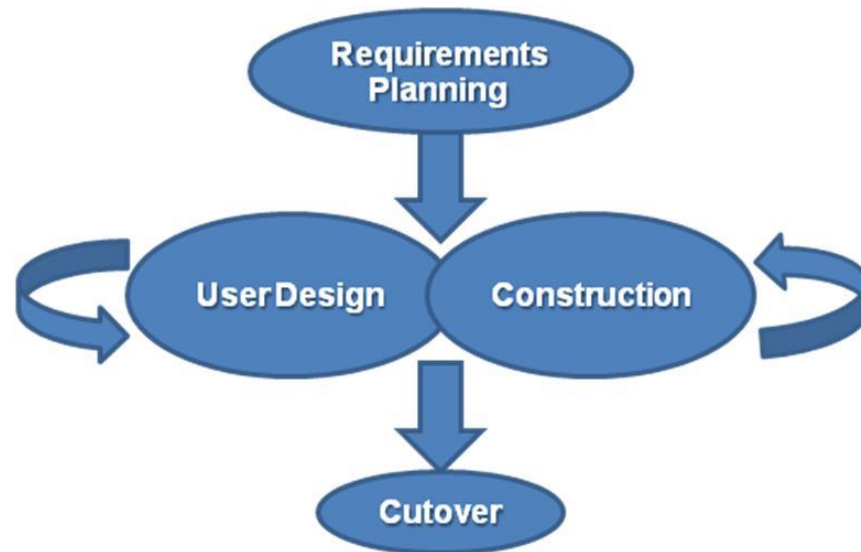
Figure 3: James Martin RAD model

2.3   Research methods

Several types of research techniques were applied to develop a sound comprehension with the business service model. The following section will elaborate on the methods systematical-ly.

2.3.1   Interviews

After building up an introductory understanding, the author directed two unstructured inter-views with GDF proprietary. According to (Dawson 2009, 27) unstructured interviews can un-cover fundamental information as you may be able to dig deep. The questions are less formal and open which will permit the interviewee to give augmented answers without any require-ments. The information gathered was well documented by the author and later reviews re-vealed a broader comprehension of the business model and its coveted usefulness. Further-more, throughout the project several open discussions were organized for developing mutual comprehension.

2.3.2   Service design

After initial data collection service design concepts were drawn in for laying down the struc-ture of the development. The service design is a framework which is comprised of design thinking and the design methodology for producing an ideal service for a particular domain. The process is utilized for characterizing a unique service and interaction between the service providers, users and stakeholders for comprehension of the profitability of a service. Service design can also be characterized as a robust framework, which can reveal interdisciplinary

actions of the user and also the service providers. The service designing process can include creating mind maps, customer journey maps and critical analyses of several sub factors (Marc, 2012, 22).

Several user groups are involved in the process which requires a holistic design concept. As indicated by (Marc, 2012, 38) the holistic design idea goes beyond the concept of a single user group. Different user groups are considered which also incorporate the stakeholders. Furthermore, demands and consideration of each groups such as end user, managers and even the non-human interfaces for e.g. websites are also considered. Please consult figure 3 for visual comprehension.
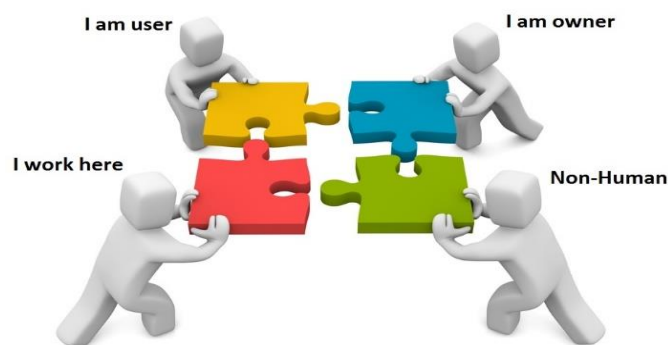

Figure 4: Holistice design concept

2.3.3 Benchmarking

A benchmarking is a process used by organizations or individuals for measuring or comparing the quality of any product, service or any relevant standard. The aim of any benchmarking process is to examine how competitor or other organizations in the field have gained a reputation (Stapenhurst 2009, 5). The process was conducted collaboratively with GDF management and documented results were accounted in order to comprehend the standards of quality and functionalities.

2.3.4 Wireframes

Wireframe is a concept which is utilized for the advancement of computer applications, the concept is also so referred as rapid prototypes. A screen blueprint is developed in correspondence of an actual application or a web. Wireframes do not include rich graphical elements, they are created for the mean of highlighting user experience plan and relevant data architecture (Ward 2012). Several wireframes were produced and assessed by GDF management. For more information on wireframe please consult section 4.2.3 UI Development.

2.3.5   Generate & Test

The following method is also referred as "Heuristic Search" and the concept is exceptionally straightforward. Despite the fact of simplicity the technique requires a systematical approach to be performed (Robin, 2009). According to another publication (Exforsys Inc, 2006) the method is an ideal approach for discovering an existing coveted solution. The process is organized in a fashion and it keeps on repeating until a solution is identified.
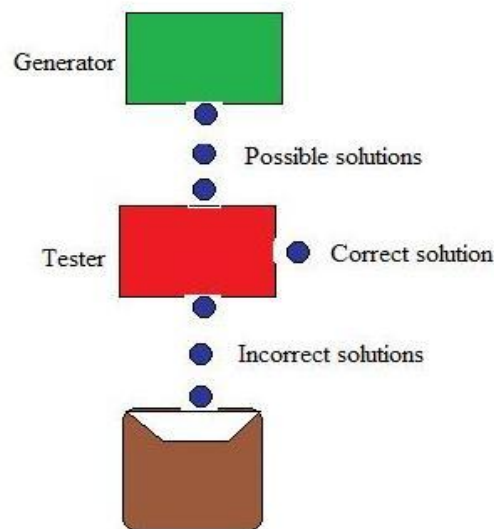

Figure 5: Generate and Error Method

Throughout the development process, there were several scenarios when the technique was adjusted for identification of solutions. The method was continually repeated and the knowledge acquainted with the process had significant values.

3   Theoretical concepts

In order to extend comprehension level with the project the following section will elaborate on theoretical concepts used in the development process.

3.1   Use Case

According to (Oracle 2007) it is a strategic concept which is utilized for analysis of a system. In the following context the use of term "system" alludes to a set of functional processes involved, these processes can be pieces of a web service or a network. By Utilizing the method of Use Case the analysts produce a graphic depiction of the components involved within the system. Doing so, will illuminate the very specific functionalities and prerequisites within a system.

3.2 Cloud computing

According to (Baun, Kunze & Minis 2006, 1) metaphorically internet is also referred as a
"cloud". It can be comprehended that, the computing resources being accessed via the inter-
net is known as cloud computing. The concept encourages the supply and utilization of plat-
forms, information technology infrastructure and even application distribution in form of ser-
vice that can be accessed via the web. The term itself indicates that, the services are being
offered by a provider via the internet. Very often the cloud service is comprised by distrib-
uting system, but a high performance mainframe computer can also be used for the very pur-
pose. Please consult Figure 5 for visual illustration.

Figure 6: Cloud computing illustration by smartcodesTZ

The cloud services are virtual instincts therefor they can be dynamically scaled. Being said so
if any application or a service demands for additional resources. The resources can be allot-
ted with minor exertion and without making any investments for physical resources. Over the
previous decade the concept picked up prevalence as it has a significant impact on the econ-
omy (Baun et al. 2001, 2). Furthermore the cloud computing is an extensive concept which
incorporates several methods and technologies, drawing in the dialog on those topics is be-
yond the extent of the following archive. Due to its relevance with the project, the author
will only elaborate on a sub concept known as cloud storage.

3.2.1   Cloud storage

A data storage accessed via the internet is commonly known as cloud storage. As indicated by (Baun et al. 2001, 9) cloud system has the potential for offering scalable storage as a service and intelligent pools of data are created without the concern of physical locations. The data pools can be defined categorically or can be organized as desired. In most cases, such services are provided by hosting companies and they are in charge of maintaining and the security of the data. Common examples of cloud storages are Dropbox, ICloud, One Drive and Google Drive.

3.3   System security

Information assets are vital for any business and the protection of these assets is critical. The utilization of information systems has prevailed over the past two decades. Targeting these systems has become common practice among individuals and hacktivist groups. As shown by (The Economist 2015) since 2005 the recorded number of known data breach incidents is over 5000, this has effected an expected number of 675 million individual data record. In 2014 just in the United States the reported number of data breaches is 783. Similar statistics were indicated by (ITRC 2015) and the number of breaches from 2005 to September 2015 was 5593, which affected 828,937,722 data records. Please consult the Figure 6 for a broader comprehension of data breaches by business sectors.
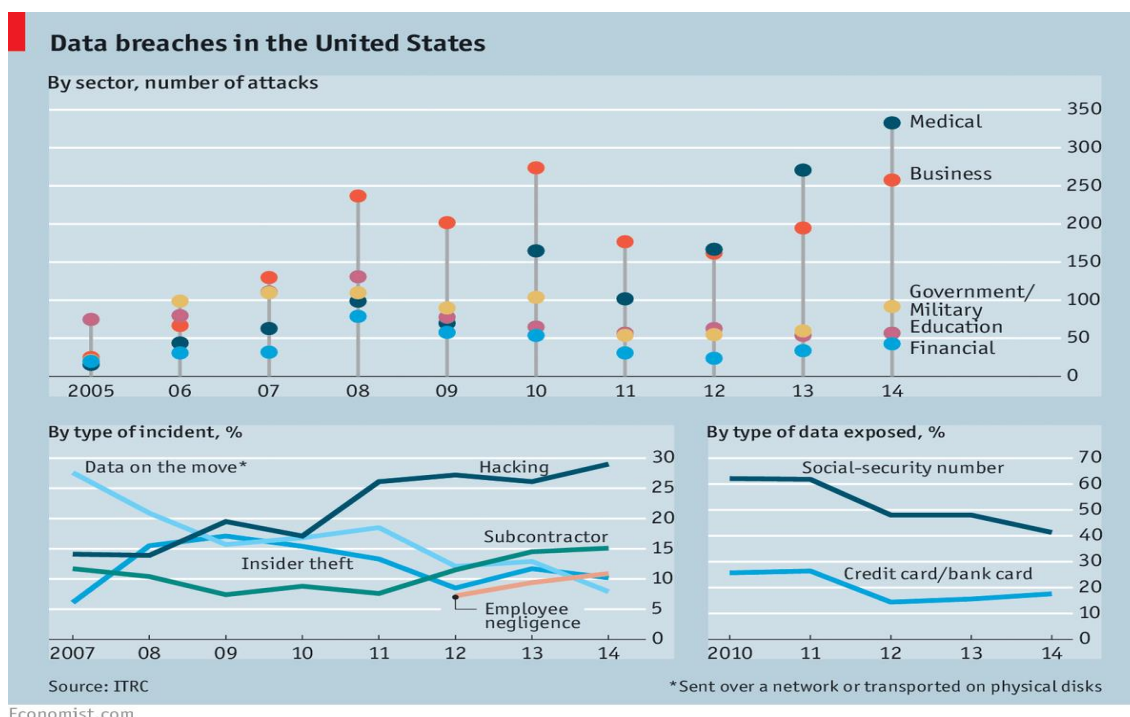

Figure 7: Data breaches in the United States

According to (Mcclure, Scambray & Kurtz 2009, 544) since the birth of high speed internet more and more e-businesses are emerging. Consistently, millions of individuals use the web and share data with minor thought of security. Step by step the world gets connected by means of the web and businesses relying on the web have become primary focus of hackers. In order to overcome the obstacle of security two main concepts were adopted.

3.3.1 Identity Management

Identity management is a concept that governs the process of verification, authentication and entitlements. The process screens, who is requesting access and to what asset the request is being made. The process of authentication verifies the Identity and then grants the capabilities associated, the authentication can be performed using PIN or Password, Biometrics or a token mechanism (Vacca 2014, 75).
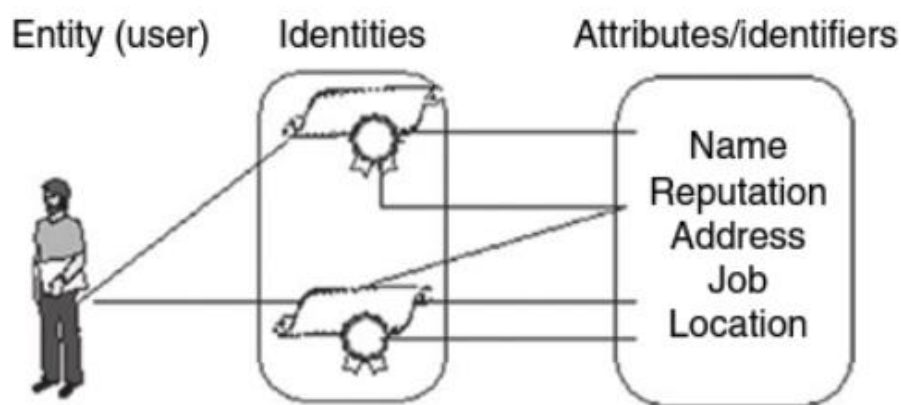

Figure 8: Identity Managment process by Vacca

3.3.2 Least Privilege

The following concept emphasis on authorizing the minimum privileges to perform an action. The concept has significant impact on the security and the system performance as well. Utilizing only the required resources to perform a task will cut down performance load and it will result system optimization. For example an end user can only access the resources which are critically needed for performing the usability tasks, while an administrating user need a higher privilege level to perform changes on a system (OWASP 2009).

3.4 FFmpeg

FFmpeg is an open source framework which provides libraries for handling of multimedia data such as Audio/Video. The framework is produced under the GNU license and freely available. ffmpeg is a critical requirement for any server which provides services such as video stream-

ing via the web. The framework contains a library of commands which is used by program log-
ic for manipulating multimedia data formats (FFmpeg 2015).

3.5   User Interface

User interface is also referred as Graphical User Interface (GUI) which is an interface visible
to a user. Any computer program or a website requires an interface, the interface is com-
prise of buttons, menus and other visual elements. Utilizing these visible elements a user per-
forms an activity which is then interpreted to a computer system. The UI has a significant im-
portance and values, an intense program with an inadequately outlined user interface has
little esteem. The term may also incorporate "User Experience (UX)" which refers to practical
experience of an interface. This incorporates visually appealing taste, content displayed and
the response of these elements. Notable elements of UI/UX are Icons, Buttons, Menus and
coloring themes (Galitz 2007, 5).

3.6   Web related technologies

The accompanying segment will elaborate on the concepts which are precisely related to the
web development. An appreciation by taking over ideas is encouraged so as to see with the
development process.

3.6.1   Front & Back-end Web Technologies

A Front-end is also known as client-side which alludes to the set of service elements available
directly for the user interaction. The term "Back-end" also referred as server-side which in-
corporates the service elements which are not visible to any front-end user but are critically
needed. The concept emphasizes on revealing the necessary ends of a service for its users.
Figure 8 displays a visual comprehension of the concept (3NYTechnology, website Front-end
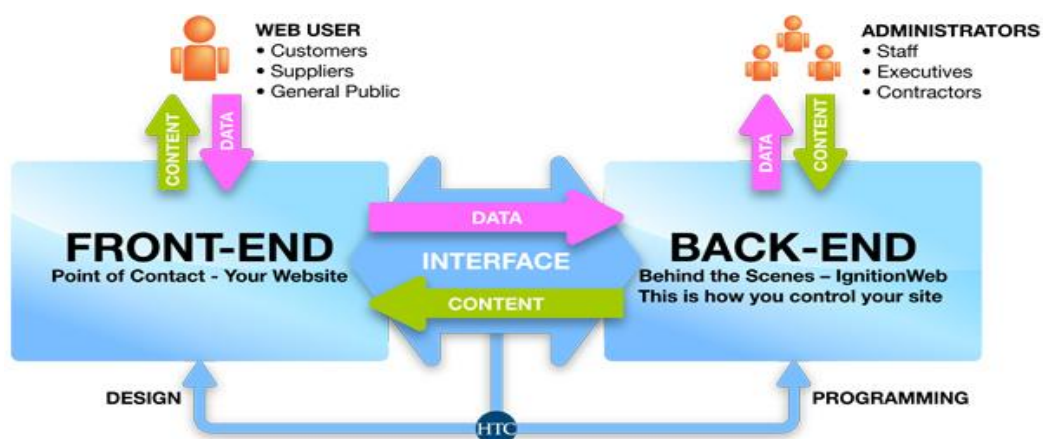and Back-end 2015).

Figure 9: Front-end vs Back-end info-graphic by Tang

The technologies associated with each of these categories can also be classified as front or back-end technologies. The developers working within these categories are referred as front or back-end developers. In specialized terms the execution conduct of front-end and back-end technologies is distinctive. The technologies involved at the front end focuses on the user interface and experience. Alternatively back-end technologies concentrate on providing the critical services needed for the front-end (Taylor & Smith 2014, 29). Earlier mention ffmpeg is a back end technology which displays a preview of a video at the front-end for users. Table 1 lists some of the most known technologies in the mentioned categories.

Front End (Clint side)	Back End (Server side)
HTML (Used for creating web pages)	PHP (Used for producing web pages)
CSS (Used for designing web pages)	ASP (Same as PHP)
JavaScript (Used for UI/UX)	ASP.NET (Web development Framework)
Bootstrap (The framework used for developing front ends)	Ffmpeg (Multimedia Transcoder)

Table 1: Front-end & Back-end web technologies

3.6.2 Bootstrap

Bootstrap is an open source front-end development framework which was developed in 2011 by Mark Otto. The framework is based on several front-end technologies and is used for rapid front-end development of a website or a mobile applications. Utilizing the framework a developer can create consistent and visually appealing elements of a front-end. Furthermore, being compatible with most of the internet browsers Bootstrap saves valuable time and has become a programmer's favorite choice (Radford 2015, 135).

3.6.3 PHP

As preceding section 3.6.1 elaborated at the client-end and server-end, PHP stands as an abbreviation for "PHP: Hypertext Preprocessor" is a well-known server side (back-end) scripting language. As Indicated by (Zandstra 2000, 8) it was originally developed by Rasmus Lerdorf in 1994 for his personal use. Because of its potential of creating dynamic contents the language capabilities were broadened and it was released publicly. PHP is executed on host machine and creates dynamic contents such as webpages, databases and several types of server scripts. Being an open source language the PHP is also platform independent can be used on

Linux, UNIX, Windows and Mac OS. According to (W3Schools 2015) PHP is a very powerful and it is used for running the world most popular social media platform "Facebook" and CMS "WordPress". Figure 9 displays and example code written in a PHP script.

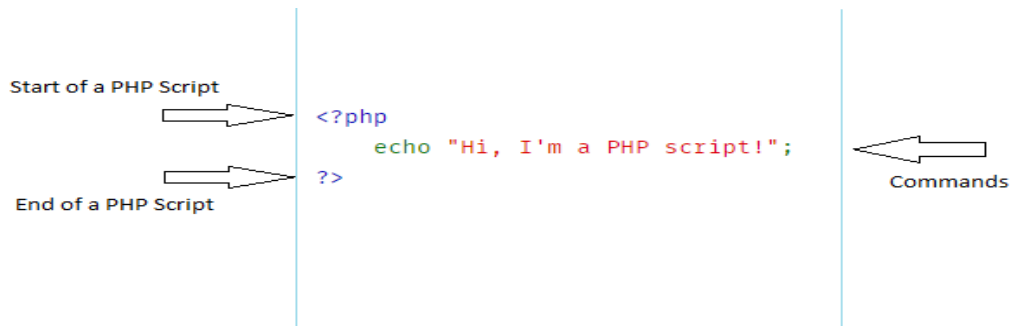

Figure 10: PHP Code example

3.6.4   Content Management System (CMS)

CMS is an abbreviation of Content Management System which is a web based application or a program used for the administration of electronic contents. The idea driving CMS is to provide a single platform which has the capability of adding, removing, altering, collaborating and distribution of electronic contents. A CMS is thought to be a front-end technology, which permits the web administrators or contributors to handle the contents of a web site produc-tively (Boiko 2001, 65). There are several types of advance CMS available now a days, some of the notable names are Drupal, Joomla, WordPress and TinyCMS.

Figure 11: CMS Features

3.6.5   Domain name & Hosting

Making presence on the internet for a business requires a distinguishing proof which is known as a domain name. It can be comprehended as remember able name on the internet which coordinates the traffic towards a website facilitated on the internet. Domain names can be registered through the hosting companies which also offers services like website hosting and cloud storages (Plumley 2010, 2). As an example Gameday Footage is a business and the domain name registered on the internet is known as gamedayfootage.com. Furthermore, all the e-mails associated with a particular domain will use the domain name as their identifier. For example webmaster@gamedayfootage.com.

4   Development

According to (Dawson 2009, 60) before proceeding any practical work of a venture it is critical to develop a comprehensive action plan of the undertaking. The actions plan must incorporate scope, quality, resources, cost and time, these are the 5 vital elements of a project process. Figure 11 represents a generic view of a project undertaking, each project demands resources, money and time in the process of producing a specific product or any other results. The end product has its own scope and quality standard to be met. Inability to establish comprehension with undertaking plan can have dramatic effects on the project performance and the ends results.
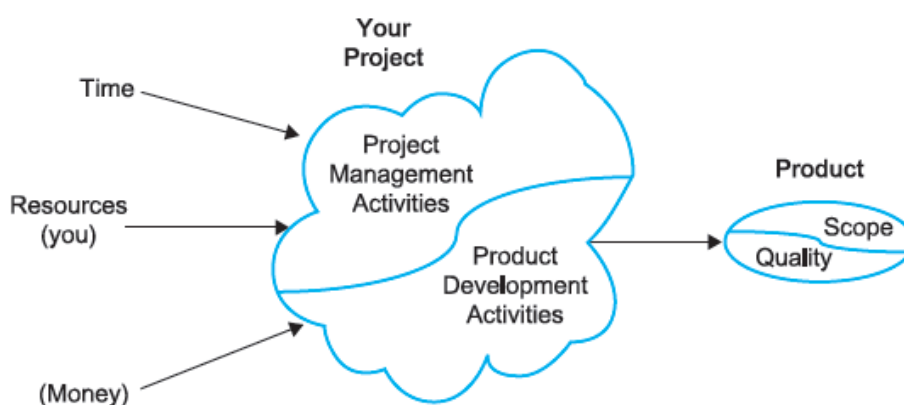

Figure 12: A generic overview of the project process by Dawson

4.1   Work breakdown structure

After identifying the core elements the project structure was laid out. Defining project scope steered toward the project segmentation, two major phases were defined for the development process. Phase one, construct the structure of web solution and deliver a functional prototype. This prototype must fulfill the demanded features of the front-end. Phase two,

the core development of the back-end and produce a beta version of the product. This product will undergo a trial period before its official launch. Figure 11 visualizes the project work breakdown structure, time frame and the millstones defined.
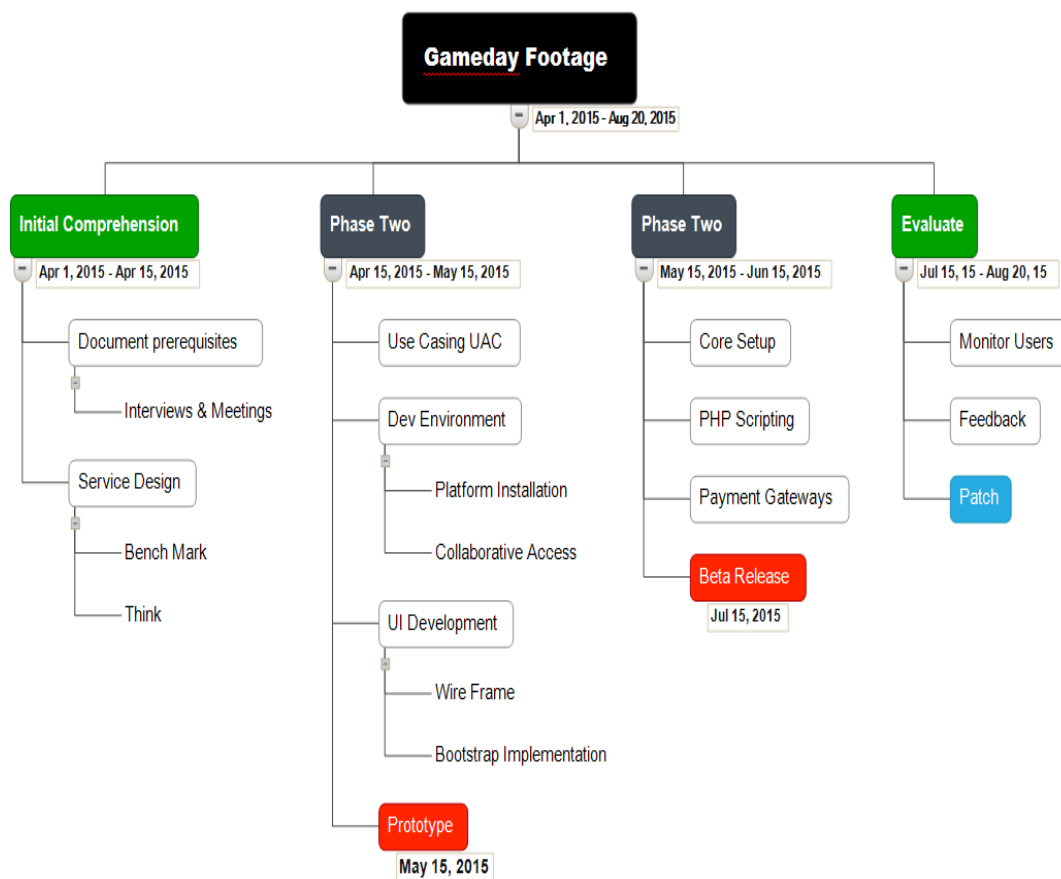

Figure 13: Project WBS

A collaborative workshop was organized for developing a common cognizance of the upcoming undertaking, several sources from the internet were benchmarked in the workshop. The beginning, thought of the benchmarking was to identify website's general layout. Image 1 illustrates on a bench marked source known as "Watch NBA". The layout components identified are highlighted in the image. These components are the login corner widget, "Games" link in the main navigation, text overlay on the primary slider and the main content section's orientation.
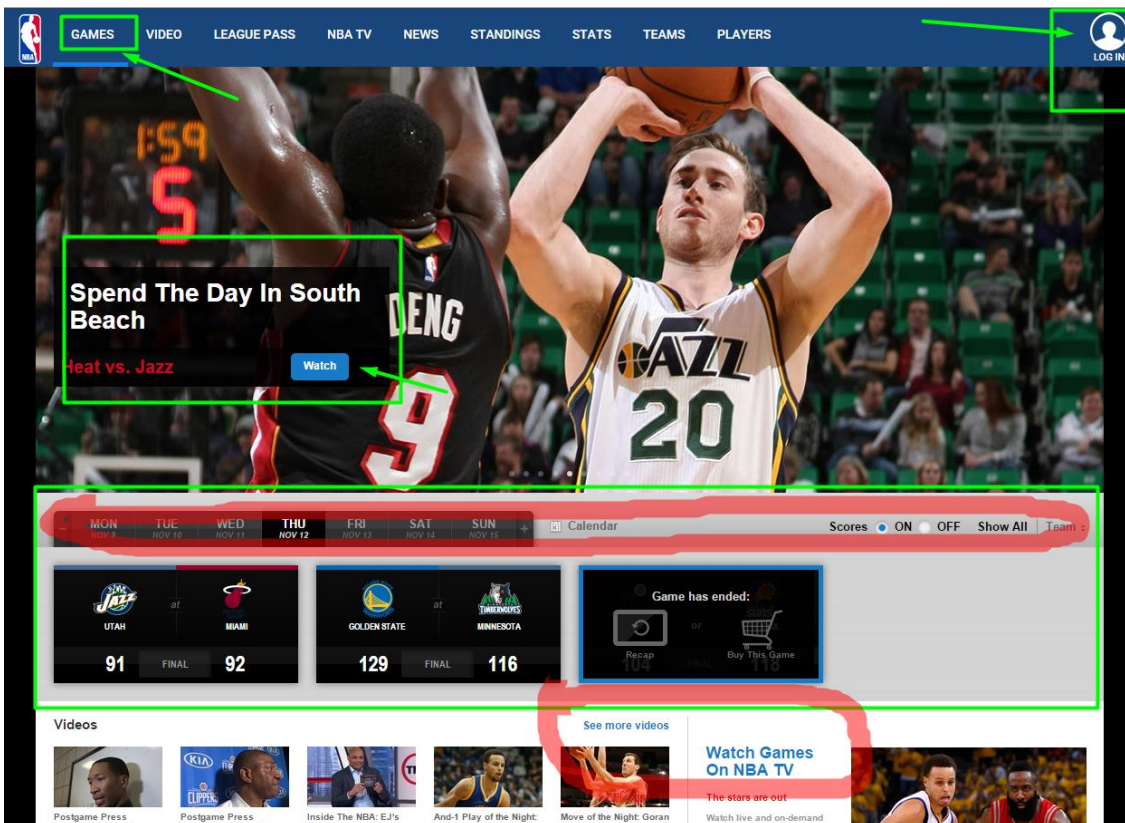
Image 1: Layout bench mark (Watch NBA)

Furthermore, in order to keep the navigation structure simple and organized, an idea of creating two navigations was received from a source known as "Extreme sports channel". Image 2 highlights a multi layered navigation panel.
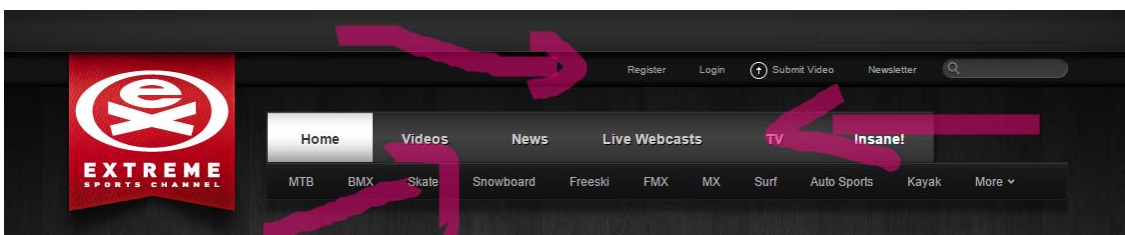

Image 2: Dual navigation (Extreme sports channel)

4.2   Phase one

4.2.1   Use Casing UAC (User Access Control)

Since the business model indicates the contribution of multiple user groups, a critical analysis of these user groups and their capabilities is necessary. Table 3 will elaborate on these user types and Use case will be produced accordingly.

User Group	Role
Root Users	Also known as super user, has global access of the system. Mainly used by system developers and system owners.
Administrators	Governs the system, can modify the permission levels and monitors the system. (Back-end User)
Contributors	Front end user group, used by contributors for publications & creating contents
Professionals	Front end user group, for professional athletes, privileges of uploading video contents.
Paid subscribers	Front-end users, can access the paid content.
Unpaid subscribers	Front-end users, cannot view the paid contents.

Table 2: User Account groups

As per table 3 user groups and their roles are categorized which will enlighten the process of the use cases. As each user group has a distinctive set of capabilities, the use case method will focus on outlining the capabilities for each user group. In reference please consult figure14.
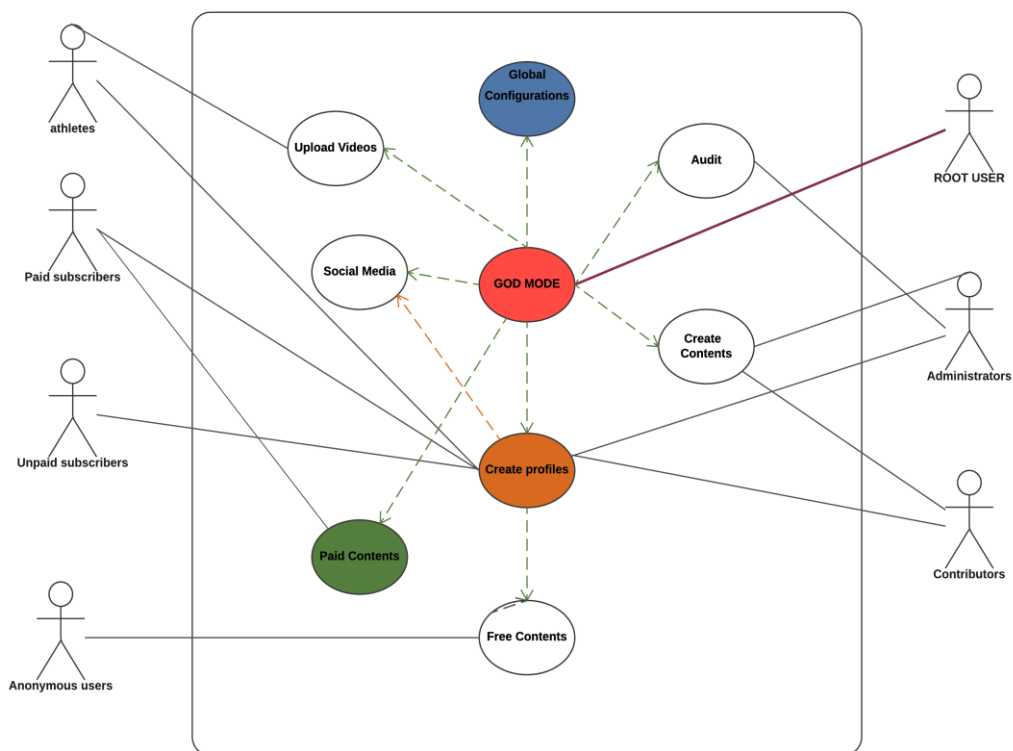

Figure 14: UAC use case

4.2.2 Development Environment

In order to make presence on internet a domain name "www.gamedayfootage.com" was registered and a cloud based virtual platform was leased for the development process. Considering the real time collaboration, utilizing a cloud based environment is a convenient selection. As mention in section 3.2 Cloud computing, the management of cloud environment is organized via web interface and is facilitated by the hosting company. The cloud management interface offers a variety of tools such as installation of CMS and handling databases.

By utilizing the provided cloud management interface, the installation of content management system was executed. Moreover, it was an important factor to isolate the development environment. This was organized by applying "Identity management concept" and during the development phase one, the domain was inaccessible by any outside parties. Only a selective group of individuals had the access to the environment.

4.2.3 UI Development

The process of UI development was initialized by creating wire frames for the website. Each section was individually looked into and the best practices identified were applied. As (Howard 2009) mentioned, while creating wire frames it is important to focus on functionality rather than prettiness. The process must be conducted with the collaboration of the stakeholders and keeping it simple and convenient for the end users.

Following the recommended practices a collaborative workshop was conducted for creating wire frames. The produced wire frames reflect on the coveted usefulness and modern web standards. Figure 13 displays a wire frame constructed for the header area of the website. The header section is comprised of the logo area and two navigations panels. Top navigation includes user login, social media link and a link for affiliate section. The main navigation, located on the right of the logo area includes four important links for faster navigation.
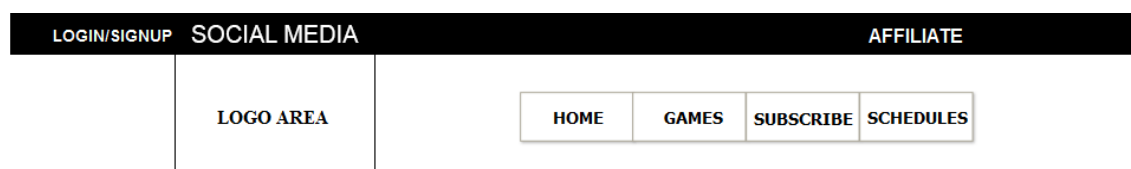

Figure 15: Header Wire Frame

Applying the same principle of simplicity, the wire frames for the footer section were produced. Figure 14 illustrates on the footer section wire frame produced for the anonymous us-

ers. The middle area of the footer contains important links for end users and is not displayed for the anonymous viewers.
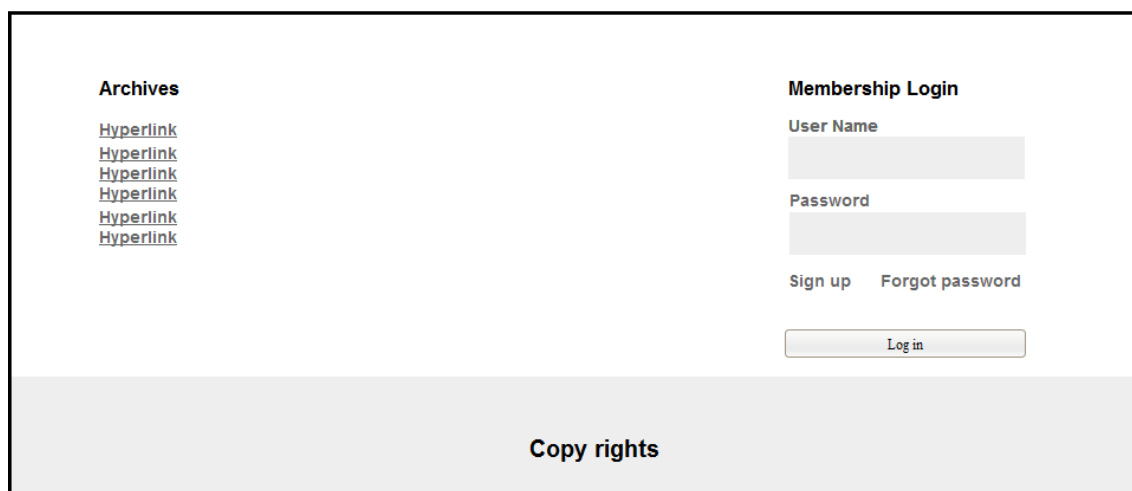

Figure 16: Footer Wire frame for anonymous viewers

Figure 16 presents the footer wire frame for registered user and the relevant link are visible.
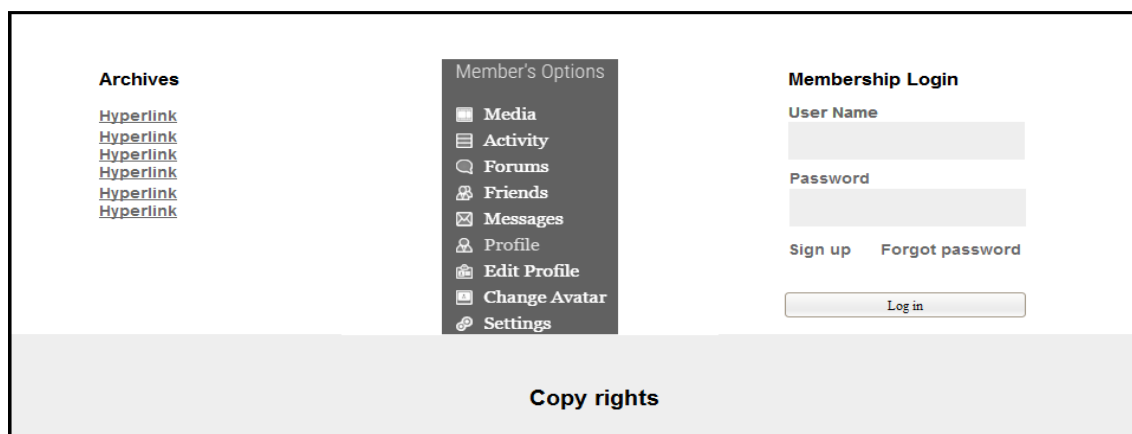

Figure 17: Footer wire frame for subscribers

The layout and the contents displayed on main page holds significant values. According to (Plumley 2009, 52) statistics have revealed that, for a visitor to making a decision of further exploration of a website will take 6 to 8 seconds after opening a homepage of a website. Considering the mentioned factors the home page wire frame was cooperatively created, for reference please view Figure 18. A slide show with content overlay was arranged, the slide show will auto navigate and will promote the marketing contents.

Proceeding onward to the main content section of the landing page, a news feed segment was defined. The feed section will include a navigation bar on the top. Most recently featured story dialog box will appear on the left and the follow up feeds will display on the right.
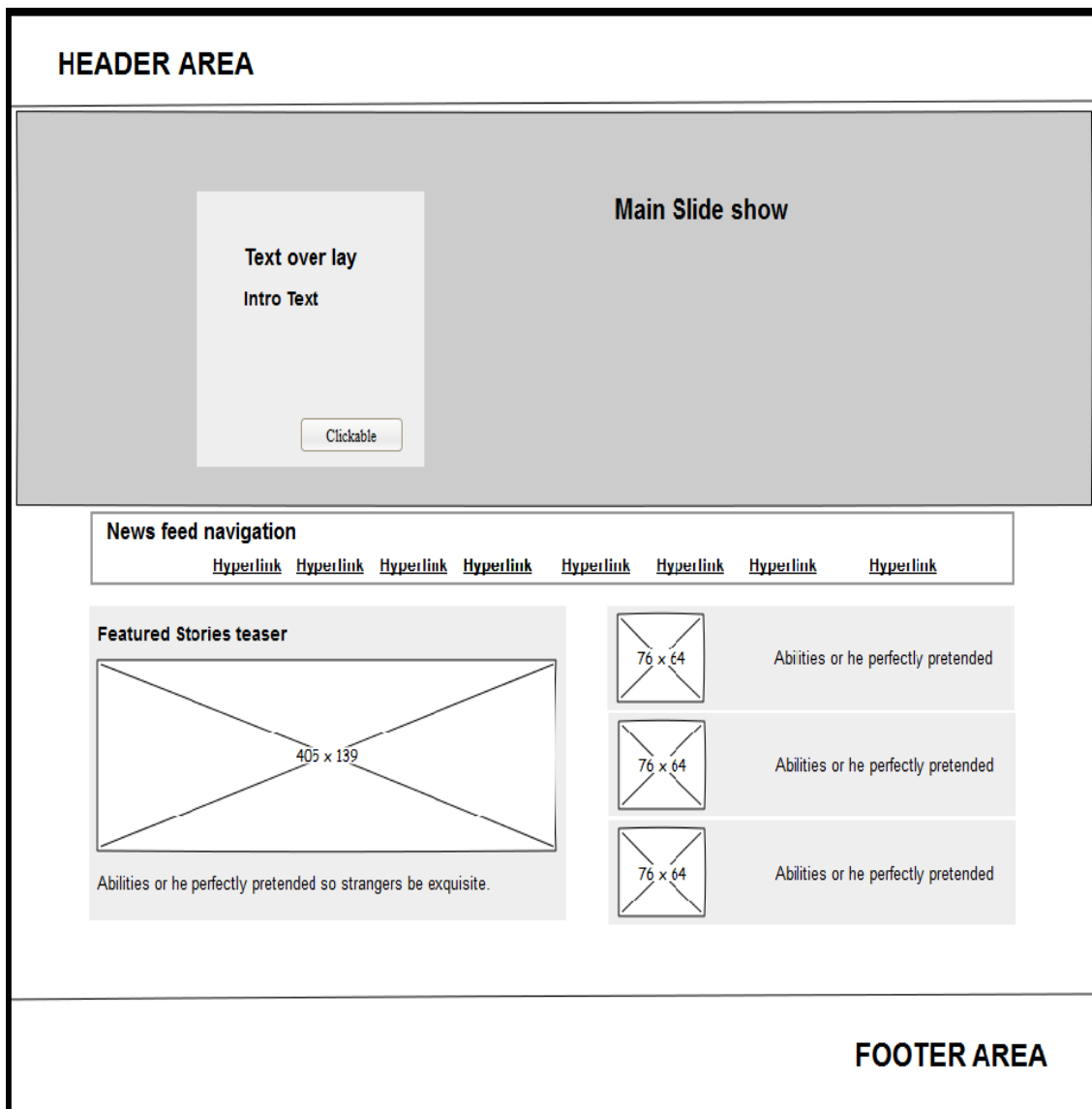
Figure 18: Gameday home page wireframe

The next important section of the website is the games exhibition, which features the posted videos by athletes. Considering the viewer's comfort a grid of video previews was designed for an easier navigation. In order to provide an effective user experience a sidebar on the right was modeled. The sidebar provided two search dialogs featuring the search criteria defined by the GDF management. A post pagination function was added at the base of the gallery to enrich the navigation functionality. Figure 19 displays the modeled wire frame.

HEADER

131 x 119	131 x 119	131 x 119	131 x 119	
Game Tittle	Game Tittle	Game Tittle	Game Tittle	
View Game	View Game	View Game	View Game	

Search by Player

Enter Player Name

Search by Country

Enter CountryName

131 x 119	131 x 119	131 x 119	131 x 119
Game Tittle	Game Tittle	Game Tittle	Game Tittle
View Game	View Game	View Game	View Game

Post Navig

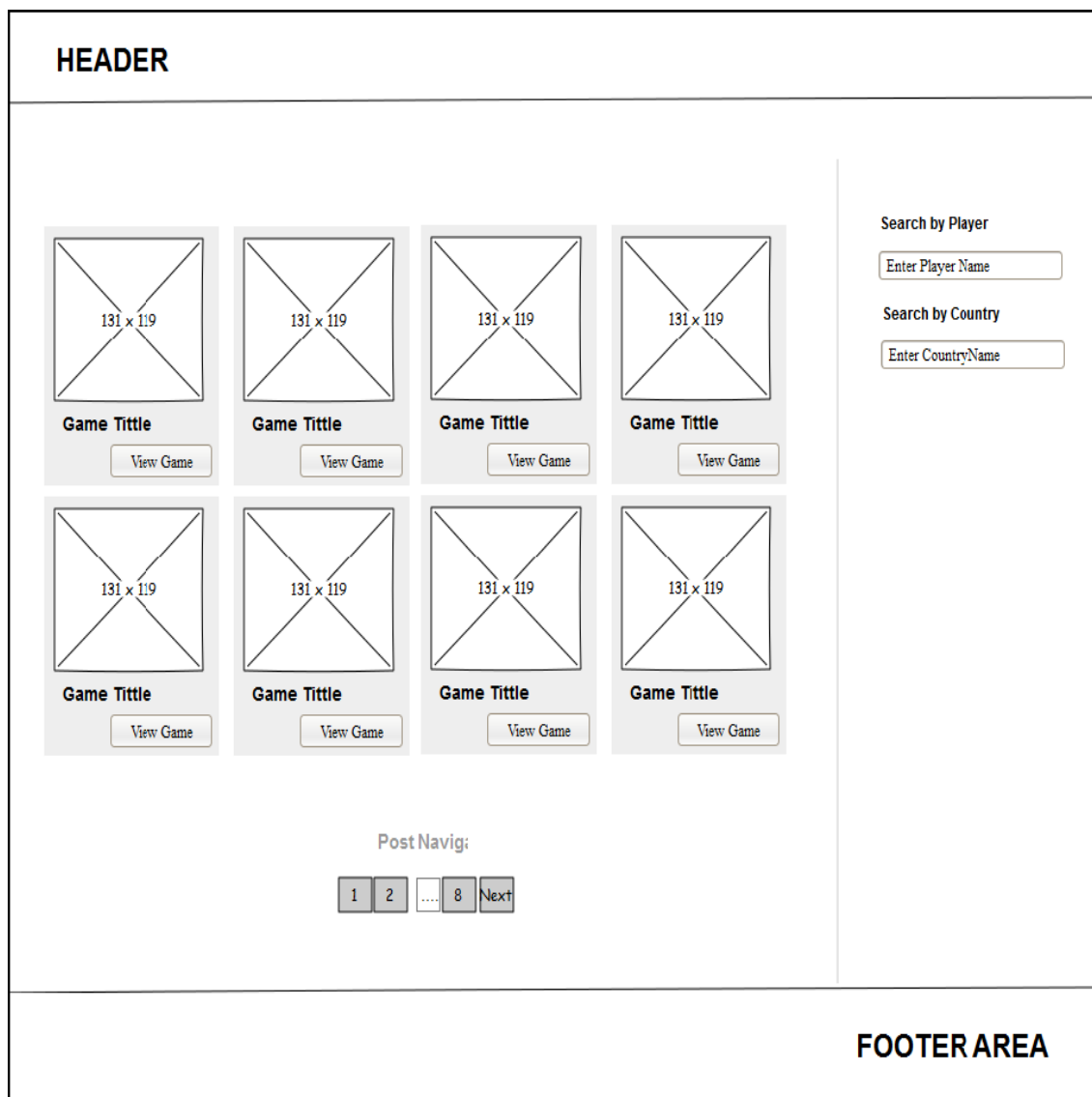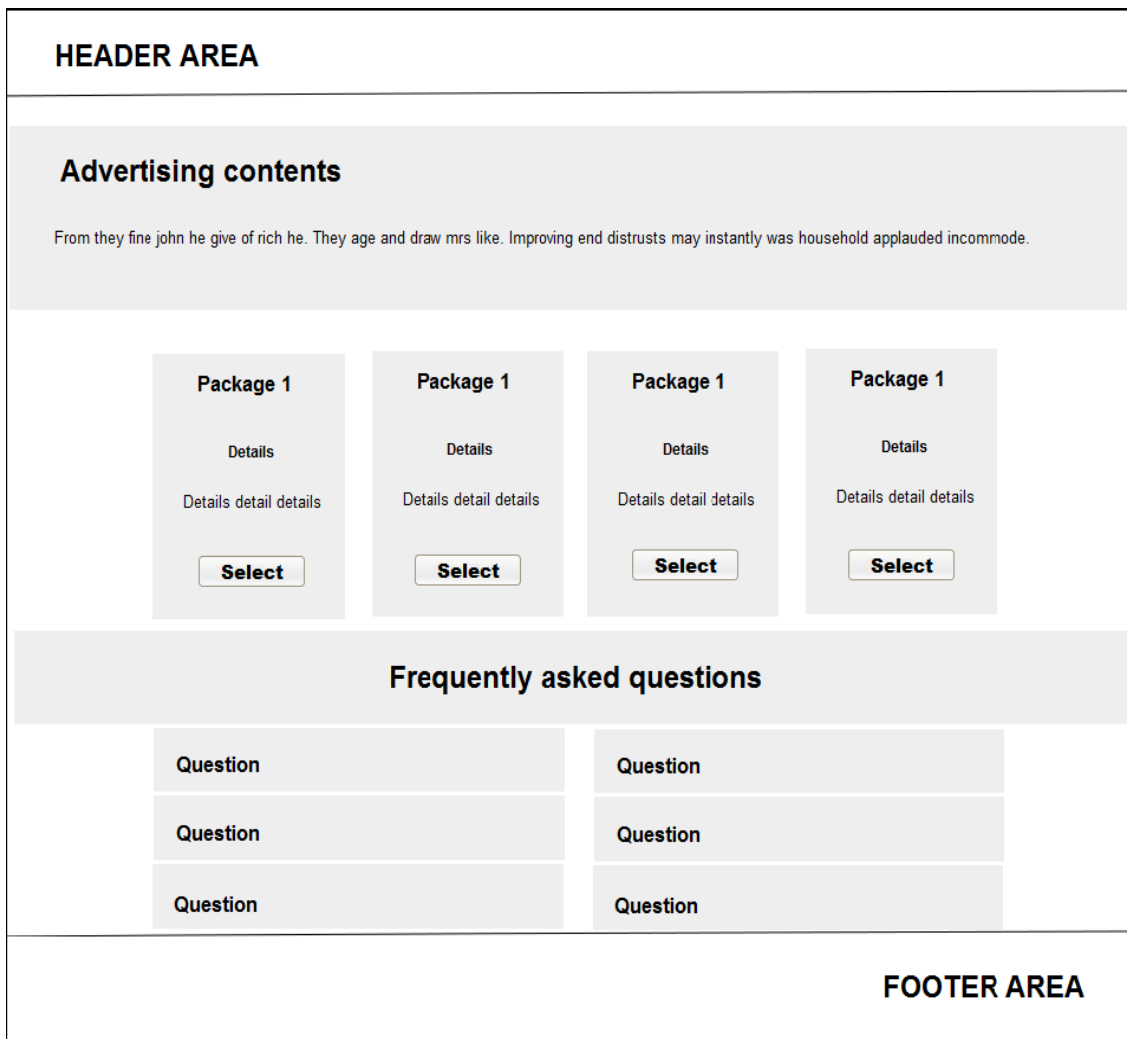| 1 | 2 | .... | 8 | Next |

FOOTER AREA

Figure 19: Video Exhibition section of the website

Another key area of the service model is the subscriber zone, which can be accessed via the main navigation with a single click. At the top of the subscriber page a portion for marketing contents is reserved. The central content area of the page lists all the available membership bundles. At the base a frequent question and answers section was characterized for information augmentation.

HEADER AREA

Advertising contents

From they fine john he give of rich he. They age and draw mrs like. Improving end distrusts may instantly was household applauded incommode.

Package 1	Package 1	Package 1	Package 1
Details	Details	Details	Details
Details detail details	Details detail details	Details detail details	Details detail details
Select	Select	Select	Select

Frequently asked questions

Question	Question
Question	Question
Question	Question

FOOTER AREA

For the rapid development of the UI a well-known framework bootstrap was utilized. Bootstrap offers several prebuild templates which can be easily configured as desired. For GDF front-end development mixed: mobile and desktop combination was used. Using the mentioned combination a flexible front-end was created which can dynamically adapt any screen size and scales the contents accordingly. The page templates were created by using PHP on the server end. Figure 20 displays the bootstrap layout grid.
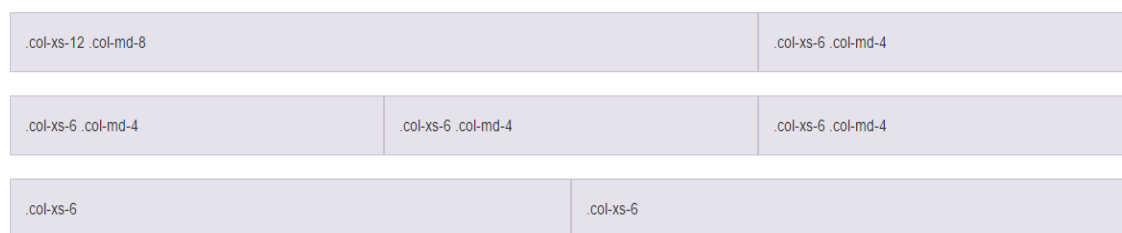
.col-xs-12 .col-md-8		.col-xs-6 .col-md-4
.col-xs-6 .col-md-4	.col-xs-6 .col-md-4	.col-xs-6 .col-md-4
.col-xs-6		.col-xs-6

Figure 20: Bootstrap grid

4.2.4   Proto release

On 15 May 2015 the first prototype of the site was released, which later had several altera-
tions during the maturity process. A fully functional front- end was produced, which featured
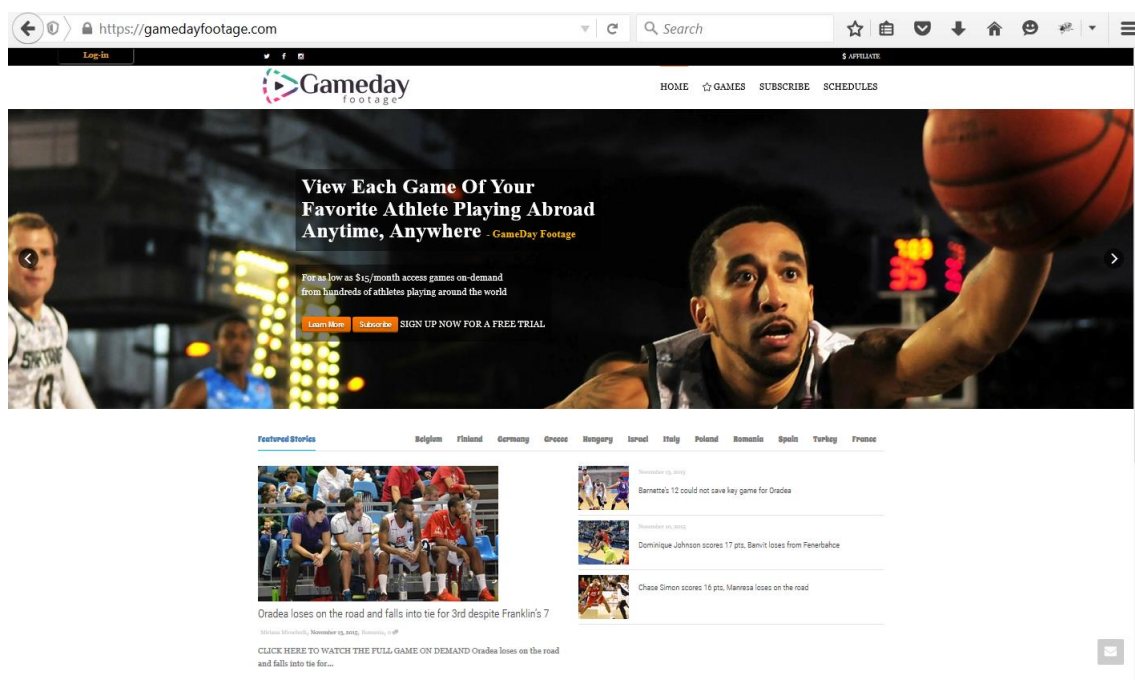all the elements demanded by the stakeholders. Image 3 displays GDF homepage first look.

Image 3: Game day Homepage

The prototype went under the testing phase for a duration of 1 month, during the testing
tenure the numbers of users were extended for trial purpose. The data collected from these
trials enabled the author and the management to identify and eliminate the conceptual flaws
in the design. For further comprehension with evaluation process, please consult section 5
Evaluation.

4.3   Phase two

The following section will elaborate on the process of core development.

4.3.1   Core Setup

As previously indicated in section 3.2 Cloud computing, the resources of a cloud structure are
scalable. Following phase was initialized by scaling the resources of existing cloud, the plat-
form was upgraded to high performance server. The storage capacity was also scaled to a
massive level in order to facilitate multimedia. Furthermore a valid security certificate was

also issued by the hosting service providers. Please consult figure 21 in order to comprehend the upgraded model.

Figure 21: Gameday network

As indicated in section 1.3 Project Objectives, the platform must have the potential of video streaming. This required the installation of ffmpeg, a well reputed multimedia transcoder. The documentation provided on the ffmpeg official website elaborates on straight forward process of installation. Figure 22 illustrates on the ffmpeg installation process on a Linux based system. The following commands must be executed via the root user of the system. Initial line of command fetches the dependencies, these dependences are critical for ffmpeg installation.

Figure 22: FFmpeg installation process snapshot

The platform security is organized by the hosting service provide, with respect to the end user's security a consolidate idea of "Least privilege access" and "Identity Management" has been placed. The combination of these two layers of security will have significant impact on resource optimization and system security. Utilizing the security certificate provided by the hosting service, the traffic directed to the web server is encrypted.

4.3.2   PHP Scripting

The following section will elaborate on the scripting process for UAC and ffmpeg. As mentioned earlier the installation of ffmpeg is a straight forward process. However, in order to display the contents a program logic must be defined (FFmpeg documentation 2015). Figure 22 displays an example of PHP executing FFMPEG.

FFmpeg Library Command
-i   Inpute file name
-ss   Generate snampe shot from from X seconds in the video
-s   Size of the image.
Defining variable in PHP for FFmpeg directory location
$app_path = '/home/bin/';
Executing FFMPEG & capturing snapshot at 5 second of image
$cmd = $app_path . 'ffmpeg -ss 5 -i ' . $file_path. ' -s 320x210
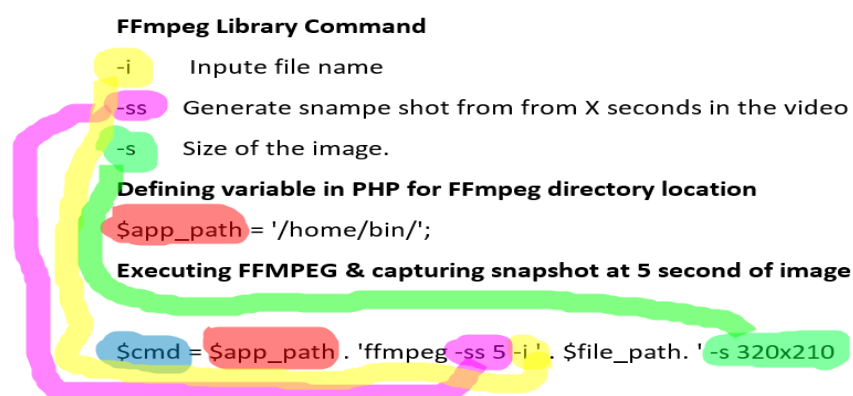
Figure 23: PHP script for executing ffmpeg

Proceeding onward to another challenging aspect of the project, the implementation of the UAC. Figure 24 shows a custom PHP script structured for the execution of UAC. Furthermore elaborating on the user access controls, CMS being used has inbuilt features for site administrators, contributors and anonymous users. The produced script integrates with inbuilt features of the CMS and it extends its potential to fulfill the desired control levels.

```php
81
82    switch($UAS) {
83        case 'administrator':   //for Site administrating users
84          $adminClass = true;
85        break;
86
87        case 'athletes':    //Uploading video function
88          $uploadClass = true;
89        break;
90
91        case 'package1': // Minimum subscription level
92          $subscription = true;
93        break;
94
95        case 'package2': // Stage two subscription level
96          $subscription = true;
97        break;
98
99        case 'package3': // stage three subscription level
100          $subscription = true;
101        break;
102
103        case 'package4': // stage four subscription level
104          $subscription = true;
105        break;
106
107        default:
108          $subscription = false;
109    }
```

Figure 24: PHP script for UAC

4.3.3   Payment Gateways & security

Users can subscribe using several payment methods such as PayPal, Visa, MasterCard, American express and Solo debit service. Indicated by (Kyrnin 2015) in case you are running an online store using HTTPS (Hyper transfer protocol with secure socket) is a must. If an attacker intercepts an insecure communication, this can reveal customer's credit card numbers and private information. The mentioned threat was eliminated as the HTTPS was already in place and the security certificate issued by the hosting acts as an identifier for secure transactions.
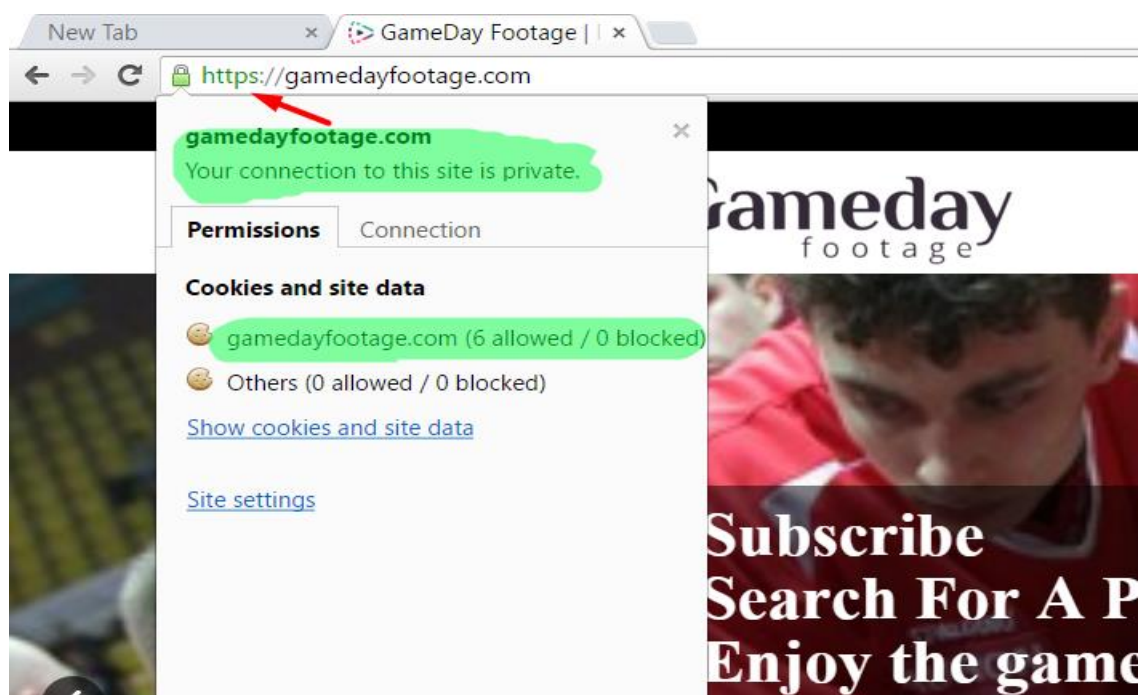
Figure 25: HTTPS and security cetificate

4.3.4   Beta release

Throughout the improvement process existing prototype was re-engineered on several occasions. A few components were cut over and a couple of new elements were integrated. On 15 July 2015 absolutely as arranged, a beta version of the website was launched. In the beginning couple of weeks the website was only allowed in few European countries. Several analytic tools were used for recording the performance levels and the user's behavior. The analytics revealed the statistics about the operating systems, browsers and screen resolutions being used by the end users. The collected data was used for tweaking the performance and visual behavior of the contents. In order to get familiar with collected statistics please consul section Appendix 1 Analytics & statistics.

5   Evaluation

In order to comprehend the performance of the web platform, a feedback form was integrat-ed within the site and the feedback from the users was collected throughout the process. Moreover, utilizing the analytics tools revealed very precise data about the technologies inte-grated. The data revealed by the analytics can be viewed in appendix 1 and the questions asked in the feedback form can be viewed in appendix. On 20 August 2015 after many ad-justments and patches, the Gamday Footage was officially launched by its management. The site offers four membership levels for its viewers and within two weeks of time over 359 users signed up. The web site has an appealing interface for any device and contents are dynami-cally scaled according to the screen sizes.

During the second phase, the project scope was somewhat changed as the stake holders re-quested for a new set of features which were not agreed upon in the initial phase. The ap-proach used for project undertaking was prepared for embracing any changes, newly advised featured were also successfully implemented.

6   Conclusion

Keeping a note of all the project's objectives and scope the project has been a great success. All the milestones and objectives defined were achieved within in characterizing budget and time frame. The coveted usefulness, security and quality standards defined by the stakehold-ers were all accomplished. The feedback received from the management & proprietor of GDF has been very pleasant. Please consult appendix 2 for certificate issued by the company's CEO. Additionally the end users feedback concerning the website's usefulness, navigation and user experience has been pleasant as well.

At present, 194 professional athletes from 12 sports leagues throughout the world are fea-tured in Gameday Footage. The following archive was produced after two months of the offi-cial release of the service and at present the number of subscribed users is 1079 which is an-ticipated to develop.

As mentioned GDF is based in United Stated and its primary targeted audience resides in United States. Most recent statists have revealed a huge amount of traffic being originated from United States. Figure 26 speaks of an information graph which highlights (dark blue re-gions) the origins of the traffic directed toward the website.
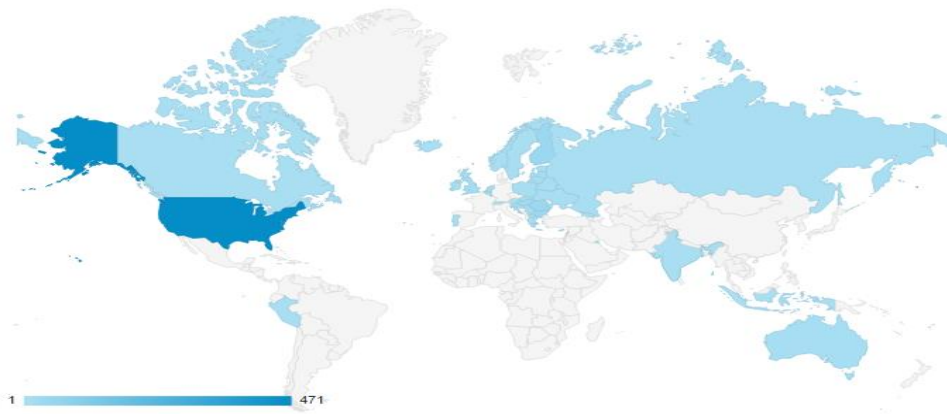
Figure 26: Traffice info graph

Currently the services offered by GDF can only be accessed via a web browser and with a specific goal to enhance the convenience level. The management has decided for developing standalone applications for mobile and TV platforms. The author will play a key role in the development of these new applications.

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Figures

Tables

Appendixes

Appendix 1: Analytics & statistics

Statistics of Internet Browsers being used by end users

	Browser	Acquisition			Behavior	
		Sittings ↓	% New session	New users	Immediate removal of the percentage	Pages / Session
		738 % Of the total: 100.00% (738)	88.21% The average view: 88.21% (0.00%)	651 % Of the total: 100.00% (651)	71.41% The average view: 71.41% (0.00%)	2.40 The average view: 2.40 (0.00%)
☐	1. Chrome	326 (44.17%)	81.60%	266 (40.86%)	66.26%	3.18
☐	2. Safari (in-app)	235 (31.84%)	97.02%	228 (35.02%)	83.40%	1.35
☐	3. Safari	112 (15.18%)	89.29%	100 (15.36%)	68.75%	1.78
☐	4. Firefox	26 (3.52%)	88.46%	23 (3.53%)	53.85%	2.54
☐	5. Internet Explorer	23 (3.12%)	78.26%	18 (2.76%)	56.52%	5.09
☐	6. Android Browser	11 (1.49%)	100.00%	11 (1.69%)	72.73%	1.73
☐	7. The Edge	2 (0.27%)	100.00%	2 (0.31%)	50.00%	3.50
☐	8. Amazon Silk	1 (0.14%)	100.00%	1 (0.15%)	100.00%	1.00
☐	9. BlackBerry	1 (0.14%)	100.00%	1 (0.15%)	100.00%	1.00
☐	10. Opera	1 (0.14%)	100.00%	1 (0.15%)	0,00%	6.00

Display resolutions on end users devices

Display Resolution	Sittings	Sessions%
1. 360x640	136	25.42%
2. 375x667	119	22.24%
3. 320x568	98	18.32%
4. 414x736	55	10.28%
5. 768x1024	32	5,98%
6. 412x732	21	3.93%
7. 320x480	17	3,18%
8. 320x570	11	2.06%
9. 320x534	7	1.31%
10. 1280x800	4	0.75%

view full report

Analytics of end user interactions with web contents.

Statistics on Pageviews per session based, infro graph displays the content exploration.

Depth of Visit	Sittings
1	540
2	56
3	53
4	25
5	15
6	14
7	5
8	5
9	2
10	6
11	1
12	1
15	2
17	1
20+	12
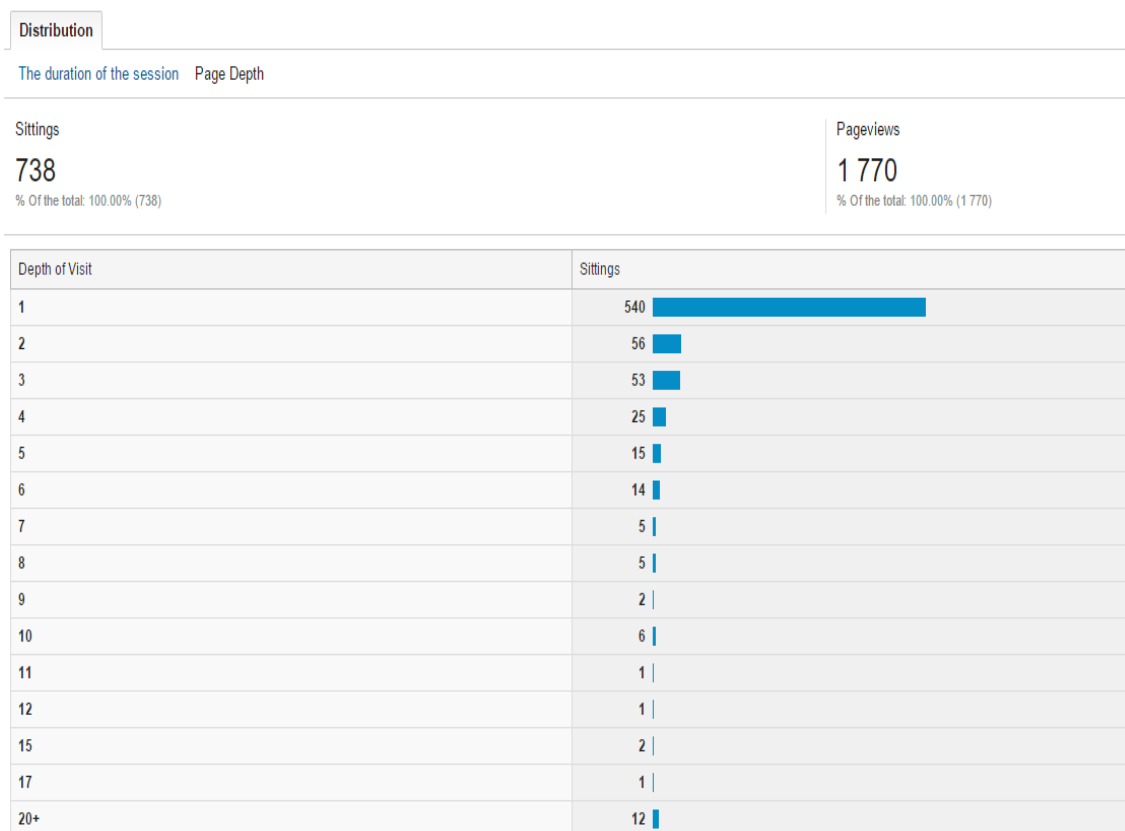
Appendix 2: Feedback

Questionnaires

Did you experience any problem in loading of the website (If yes please fill in some details in the box below)?

- A) Yes
- B) No

How will you rate the color scheme of the website?

- A) Bad
- B) Good
- C) Very Good

How will you rate the navigation structure of the website?

- A) Bad
- B) Good
- C) Very Good

How will you rate the signup process?

- A) Bad
- B) Good
- C) Very Good

The information displayed guides through the process?

- A) Yes
- B) No

Searching the games was easy?

- A) Yes
- B) No

Video stream was smooth?

- A) Yes
- B) No

Do you have any suggestions for improvement of our service?

If yes, please fill in the information below and hit submit.

Development feedback by CEO

10-20-2015
To whom it may concern:
Dear Sir/Madam,

Gameday Footage is a marketing agency dealing with professional athletes who play abroad, featuring each game of their season on-demand and advertising them to their fan base back home to watch.

We hereby certify that Mr. Ata UI Jamil has been serving at Gameday Footage, started on April 1st 2015. His responsibilities include development and maintenance of Gameday Footage web services.

The Gameday Footage officials and its management have been highly appreciative of Mr. Ata UI Jamil's services.

Sincerely yours

Kyle Shiloh
CEO