



# HoopStats Final Project Report

Version 1.0

Project Name	Version: 1.0
Final Project Report	Date: 2013-01-20

## Revision History

Date	Version	Description	Author
2013-01-20	1.0	Final version	Predrag Filipovikj

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## 1. Introduction

### 1.1 Purpose of this document

The following document is intended as the conclusive reference after the end of the project. Therefore it is written in the final stage of the project development. It summarizes the project artifacts as well as an overview over the project stages. Furthermore it describes shortly the project experiences and gives an overview of the requirements and their fulfillment. As the document is written at the end of the project it will not be updated and has no other documents which depend on it.

### 1.2 Intended Audience

The document is intended for the following audience as the final project reference and summary:

- Project team members
- Supervisor
- Customer

### 1.3 Scope

The scope of the document is to summarize the development process of the HoopStats project, conducted as a part of the DSD course. In the document there is a summary for the project team, milestones completed during the project development life cycle and requirements that were fulfilled or dropped during the development phase. At the end of the report, there is a summary of individual and team effort invested by each of the team members to finish the project.

### 1.4 Definitions and acronyms

#### 1.4.1 Definitions

Keyword	Definitions
HoopStats	The name of the project and the applications (web and Android client)

#### 1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
MDH	Mälardalen University
FER	Faculty of Electrical Engineering and Computing
QA	Quality Assurance
UI	User Interface
SVN	Apache Subversion
MoM	Minutes of Meeting
ASAP	As soon as possible

### 1.5 References

- ❖ Project Home
  - <http://www.fer.unizg.hr/rasip/dsd/projects/basketball>
- ❖ DatabaseBasketball Home
  - <http://www.databasebasketball.com/>
- ❖ Project Home Page
  - <http://hoopstats.tk/>
- ❖ Project Plan document

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- [http://www.fer.unizg.hr/download/repository/Project\\_Plan%5B9%5D.pdf](http://www.fer.unizg.hr/download/repository/Project_Plan%5B9%5D.pdf)
- ❖ Project requirement definitions document
  - [http://www.fer.unizg.hr/download/repository/Requirements\\_Definition%5B9%5D.pdf](http://www.fer.unizg.hr/download/repository/Requirements_Definition%5B9%5D.pdf)

## 2. Background and Objectives

The HoopStats project is intended as a reimagining of the web application databasebasketball.com. This application provides basketball statistics which are free to use by anybody. Unfortunately it provides no features for visualization of statistics and data other than tables and plain text. Furthermore the choices of the use in terms of which data the user wants to display are limited. Figures 1 and 2 show examples from the web application:

### Mahmo Abdul-rauf

**Mahmoud Abdul-Rauf** ((Chris Wayne Jackson))  
**Position:** G  
**Height:** 6' 1" **Weight:** 162  
**Born:** 3/9/1969, in Gulfport, MS, USA  
**High School:** Gulfport, in Gulfport, MS  
**College:** [Louisiana State University](#)

[About bio info](#)

#### Draft History

[1990 NBA](#) - Round 1 by [DEN](#)

**\*\*[Player News](#)**

#### Regular Season Stats

Click on column header to sort

#### Regular Season Stats

Click on column header to sort

Year	Age	Team	Lg	G	Min	Pts	PPG	FGM	
1972-73	3	<a href="#">GSW</a>	<a href="#">NBA</a>	46	629	208	4.5	82	
1972-73	3	<a href="#">BUF</a>	<a href="#">NBA</a>	9	134	53	5.9	25	
1990-91	21	<a href="#">DEN</a>	<a href="#">NBA</a>	67	1505	942	14.1	417	
1991-92	22	<a href="#">DEN</a>	<a href="#">NBA</a>	81	1538	837	10.3	356	
1992-93	23	<a href="#">DEN</a>	<a href="#">NBA</a>	81	2710	1553	19.2	633	
1993-94	24	<a href="#">DEN</a>	<a href="#">NBA</a>	80	2617	1437	18.0	588	
1994-95	25	<a href="#">DEN</a>	<a href="#">NBA</a>	73	2082	1165	16.0	472	
1995-96	26	<a href="#">DEN</a>	<a href="#">NBA</a>	57	2029	1095	19.2	414	
1996-97	27	<a href="#">SAC</a>	<a href="#">NBA</a>	75	2131	1031	13.7	411	
1997-98	28	<a href="#">SAC</a>	<a href="#">NBA</a>	31	535	227	7.3	103	
2000-01	31	<a href="#">VAN</a>	<a href="#">NBA</a>	41	486	266	6.5	120	
9 Season Totals					586	15633	8553	14.6	3514

M - MVP  
 N - All NBA First Team  
 A - All Star

Figure 1 Player data from databasebasketball.com

Figure 2 Table season statistics from databasebasketball.com

The goal for the HoopStats project is to take the free-to-use data from the web application and create a new, more dynamic web application with advanced visualization elements for data display. Users have control over which data is being displayed as a result to their flexible created queries. This is possible by providing the users templates for building queries. Figure 3 shows how this template tool system might look like. Here the users can choose from different templates e.g. player or team and choose the data he wants to know about. After that they can combine this template with restrictions to filter out the data they are interested in.

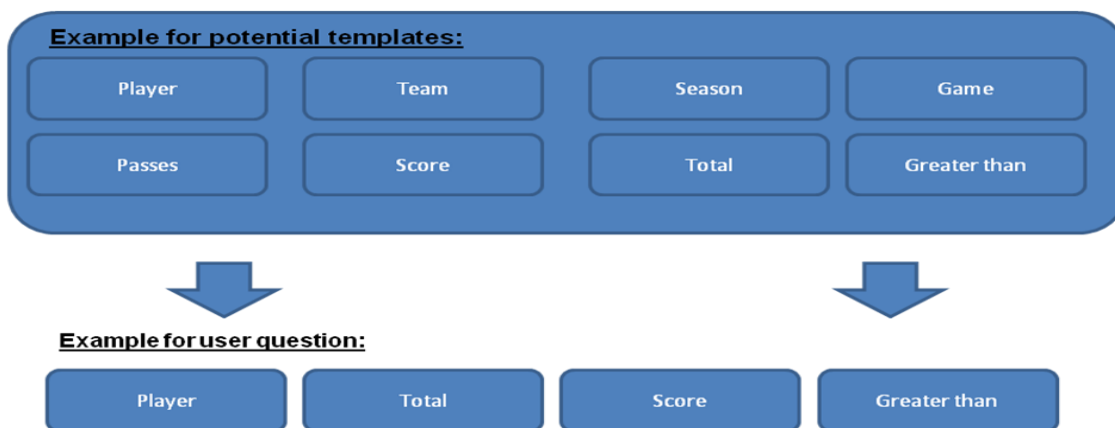


Figure 3. Potential template choice

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Furthermore the data output shown in Figure 1 and Figure 2 will be replaced with a more modern visual style. This style will be more user-friendly and will allow users to more intuitively interpret what is presented. Figure 4 and 5 show examples of how the visual data output might look like:

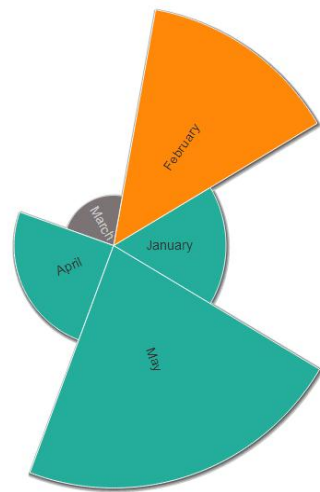


Figure 4. Pie chart for data visualization

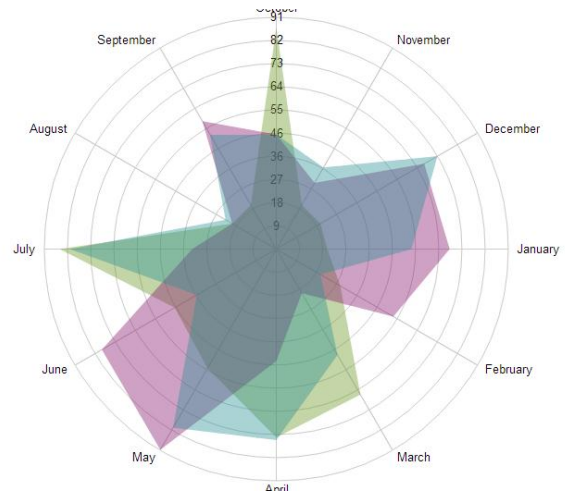


Figure 5. Net chart for data visualization

In addition to the visual changes a mobile application for Android phones will be developed, as mobile devices become more and more important for users. The application especially aims at the avid basketball fan who wants to access team statistics during a game.

The following list summarizes the main objectives of HoopStats:

- Users can design own basketball related questions
- Visuals of application are improved by using modern visual output
- Android App to use HoopStats on-the-go

### 3. Organization

In this chapter the organization of the project team is explained and what parts the individual members carried out in the project. Furthermore the customer (which in this particular case is also the supervisor) will be introduced.

#### 3.1 Project Group

The members of this project are distributed over the two locations at MDH and FER. To ensure the project's success, roles were assigned to the individual team members. The following table shows the project roles of the HoopStats team members:

Name	Initials	Responsibility (roles)
Predrag Filipovikj	PF	<i>Project Manager, Database developer, .NET Developer, Web Developer</i>
Dino Blazeka	DB	<i>Team Leader, Android Developer</i>
Andreas Köhle	AK	<i>Documentation Manager, Android Developer</i>
Bal Krishna Nyaupane	BN	<i>Quality assurance manager</i>
Armando Simones	AS	<i>Web Developer, Android Developer</i>
Igor Saric	IS	<i>SVN Manager, .NET Developer, Web Developer</i>

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### 3.2 Customer and supervisor

The customer and supervisor of the project is Juraj Feljan from MDH. He gave the initial requirements for the project and supervises the progress and direction it takes.

## 4. Development process

The development process used for building the HoopStats applications is an adapted iterative approach to meet the demands of the project. Figure 6 shows the development process.

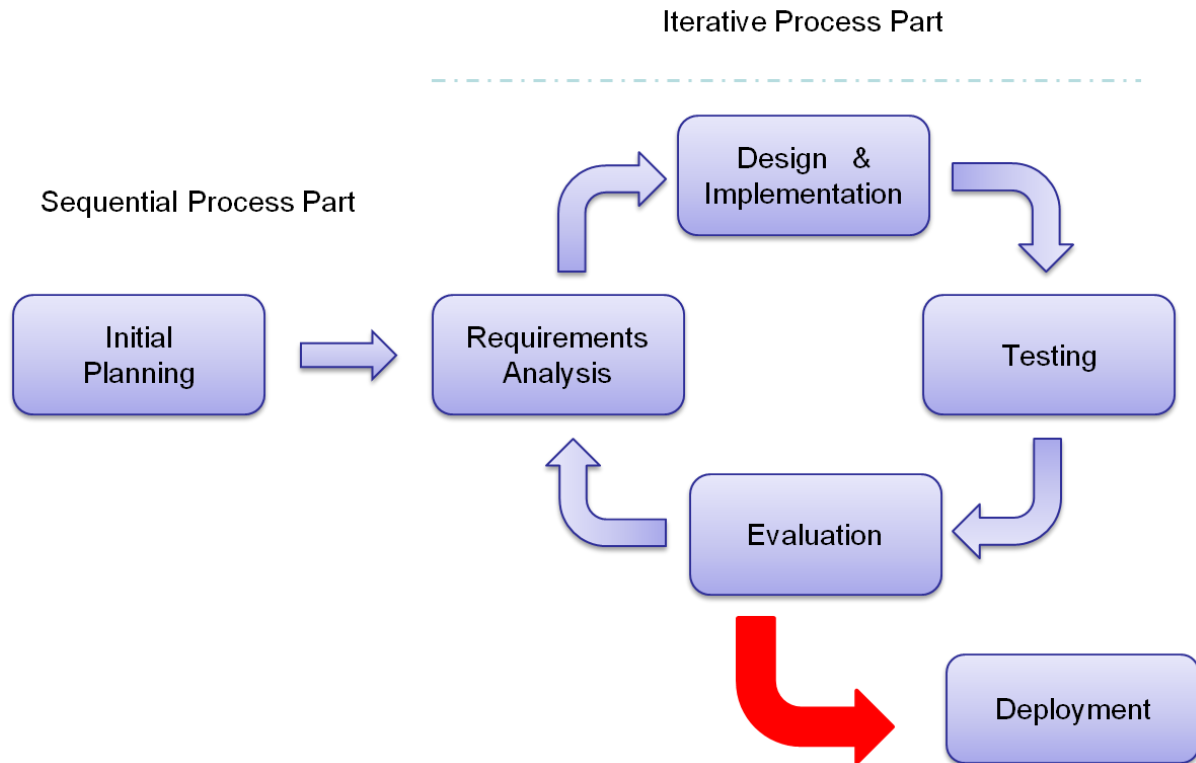


Figure 6 Development process for HoopStats

## 5. Milestones

Id	Milestone Description	Responsible Dept./Initials	Finished week				Metr.	Rem.
			Plan	Forecast Week	+/-	Actual		
M001	Finished first draft Project Plan and Requirements definition	PF and AK	W44	W44	0	W44	0	
M002	Finished first draft System design	Team members	W45	W45	0	W45	0	
M003	Presentation Alpha prototype	PF and DB	W48	W48	0	W48	0	
M004	Presentation Beta prototype	PF and DB	W50	W50	0	W50	0	
M005	Rollout final release and project presentation	Team members	W02	W02	0	W02	0	
M006	Final product and documentation delivery	PF	W03	W03	0	W03	1	Rem01

Id	Description
Rem01	All of the deliverables in the milestone had been delivered on time, except for the Test report which should have been delivered in W02 but is delivered in W03.

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## 6. Project Results

### 6.1 Requirements

#### 6.1.1 Requirement Compliance Matrix

Id	Requirement Description	completed	Rem
VR 1	Provide static graphical data output	Yes	
VR 1.1	Provide tabular representation of data.	Yes	
VR 1.2	Provide pie chart visual representation.	Yes	
VR 1.3	Provide graph visual representation.	Yes	
VR 2	Provide dynamic graphical data output	Yes	
VR 2.1	Provide table output	Yes	
VR 2.2	Provide pie chart visual representation.	Yes	
VR 2.3	Provide graph visual representation.	Yes	
VR 3	Provide webpage to display graphical output	Yes	
FQ 1	Deliver templates to create queries	Yes	
FQ 1.1	Player table template	Yes	
FQ 1.2	Team table template	Yes	
FQ 1.3	Player comparison template	Dropped	Rem1
FQ 1.4	Templates for properties as projections	Yes	
FQ 1.5	Templates for conditions	Yes	
FQ 2	Workflow to structure the template selection of the user	Yes	
FQ 2.1	Selection of table or comparison template	Dropped	Rem2
FQ 2.2	Selection of property template	Yes	
FQ 2.3	Selection of condition template	Yes	
FQ 2.4	Selection for different graphical output	Yes	
FQ 3	Constraints to cut out unreasonable queries	Yes	
FQ 3.1	Constraint to cut out unreasonable properties	Yes	
FQ 3.2	Constraint to cut out unreasonable comparisons	Dropped	Rem3
FQ 3.3	Modify previously executed query	Yes	
DV1	Details view for players	Yes	
DV2	Details view for teams	Yes	
DV3	Details view for coaches	Yes	
DV4	Season details for player	Yes	
DV5	Games details for player	Yes	
DI 1	Integration of CSV files from Databasebasketball.com	Yes	
DI 1	Integration of team images from Wikipedia.com	Yes	
DI 1	Integration of player images from Wikipedia.com	Dropped	Rem4
DI 1	Scrapping game logs data from <a href="http://databasebasketball.com/">http://databasebasketball.com/</a>	Yes	

#### 6.1.2 Requirements Compliance Summary

Total number of requirements	34
Number of requirements implemented	30
Requirements partially fulfilled	0
Requirements not fulfilled	0
Requirements dropped	4



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### 6.1.3 Remarks

Remark Id	Description
Rem1	All the functionalities related to the player comparison were dropped in agreement with the customer due to lack of time.
Rem2	All the functionalities related to the player comparison were dropped in agreement with the customer due to lack of time.
Rem3	All the functionalities related to the player comparison were dropped in agreement with the customer due to lack of time.
Rem4	The process of gathering images for players could not be automated. Manual gathering of images for players was not an option due to the large amount of player records in the database.

### 6.2 Deliverables

The following table shows the deliverables which are presented to the project stakeholders throughout the project.

To	Output	Planned week	Late +/-	Delivered week	Rem
Customer, Supervisor	Project Plan and Requirements definition	W44	0	W44	
Customer, Supervisor	System design	W45	0	W45	
Customer, Supervisor	Alpha prototype: -Database -Business Logic -User Interface	W48	0	W48	
Customer, Supervisor	Beta prototype -Alpha Prototype -Mobile Application	W50	0	W50	
Customer, Supervisor	Final release and project presentation	W02	0	W02	
Customer, Supervisor	Acceptance test plan	W01	0	W01	
Customer, Supervisor	Test report	W02	1	W03	
Customer, Supervisor	Final documentation and release	W03	0	W03	

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## 7. Risks

The following sections describe the risks which occurred during the project divided in three categories:

Risks that have appeared but their impact was low because of preventive actions:

- Insufficient data
- SVN problems
- Inconsistent Data
- Member absence due to previously scheduled obligations.

Risks that appeared and had a significant impact on project work:

- Sickness of team member or a close family member.
- Insufficient skills – not reported on time

Risks that appeared but were not foreseen:

- Lack of enthusiasm:  
We did not foreseen that some of the team members would not push as hard as it was expected from them. This was a really big problem during the project.
- Private (family) matters:  
Some of our team members had family issues, which influenced the time spent on the project.

## 8. Project Experiences

### 8.1 Positive Experiences

- Working in multi-national and multi-cultural environment.
- Ability to enrich your portfolio with professional skills.
- Experience of working in team. Teamwork is really important skill that many people think they have, but actually they do not. In projects like this, everyone can see how good team player he is.
- Experience to work in distributed team. Not everyone gets a chance to work with a team that is geographically distant.

## 9. Metrics

### 9.1 Work per Member

Member	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W01	W02	W03	Total
AK	12	14	13	8.5	6	2.5	13	20	/	11	14	20.5	15	149.5
DB	12	8	17	15.5	38	12	18	20	11	14	13	15	8	201.5
AS	9	9	17	17.5	22	16	17	19	18	5	8	14.5	10	182
BKN	9	10	16	14.5	18	20	23	12	15	15.5	1	7.5	10	171.5
IS	9	8	18	25.5	14	11	6	8	22	17	1	14	4	157.5
PF	6	12	22	24.5	28	11.5	25	20	11	14	1	27.5	37	239.5
<b>Total</b>	<b>57</b>	<b>61</b>	<b>103</b>	<b>106</b>	<b>126</b>	<b>73</b>	<b>102</b>	<b>99</b>	<b>77</b>	<b>76.5</b>	<b>38</b>	<b>99</b>	<b>82</b>	<b>1101.5</b>

The results do not give the right picture for the influence of particular team member on the project. Some of the team member spent more time learning new stuff than actually contributing to the project. In the first place there is Bal, who spent more than half of his working hours learning the technology and how to make test cases.

Lots of hours were spent on things that were total failure. Armino and Dino put substantial amount of time into the ExtJs framework, which in the end proved to be total disaster.

The lack of enthusiasm and initiative can be observed on the team members and maybe that is the cause for the low effort put into the project calculated through the working hours spent.

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## 9.2 Milestone Metrics

Completed as planned or earlier	Total	Timeliness
6	7	86%

## 9.3 Effort Metrics

ID	Activity	Actual Effort	Planned Effort	Deviation (%)	Remark
ACT01	Project Plan	8	6	75%	Rem1
ACT02	Requirements Definition	4	6	50%	Rem2
ACT03	System Architecture	13	10	77%	Rem3
ACT04	Implementation	529	563	93.5%	
ACT05	Testing	89.5	62	69%	
ACT06	Documentation	148.5	131	88%	
ACT07	Deployment	29	15	52%	Rem4

Remark	Description
Rem1	Project plan creation and update was planned and reported in week reports as Documentation activity. The actual number of spent and planned hours is different.
Rem2	Requirements definition and update was planned and reported in week reports as Documentation activity. The actual number of spent and planned hours is different.
Rem3	Most of the system architecture was done by the project manager. It was reported as implementation because it was not purely theoretical process, and during the project global meetings.
Rem4	Installation and deployment of VM took longer than expected.

<b>Effort estimation accuracy (%)</b> <i>(100*(1 - abs(Actual - Planned)/Actual))</i>	96%*
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\*The actual working hours in project are different from the numbers in actual effort. Hours for meetings between team members, meeting with client and some other activities are not taken into consideration.