

# User Action Reporting Model for Immersive Environment

Mohammad Reza Khishadeh

Bachelor graduated from Multimedia University (Malaysia)

Email:- mrkhish@gmail.com

## Abstract

The term User Action Reporting Model (UARM) is the monitoring of second life (SL) users by analyzing them through related diagrams. The second life environment which had been point as Immersive Environment(IE) is the action and behavior of virtual avatars which is in our case is the company users behavior through virtual offices working area .in this paper , we had made a different types of filters for diagrams which is useful for analyzing of virtual users to monitor them through their daily actions in the company immersive environment within web application tools likes: PHP,HTML,JAVASCRIPT, ANGULAR JS and database management system using SQL Server .Finally ,as the result we had made a web application with different filter diagrams which can monitor user actions.

**Keywords:** User Action Reporting Model, Second Life, Immersive Environment

## Introduction

Since the time, Human Beings understood the collection of data and analysis could be useful and help them to improve their actions for reaching their goal ;it was always been a problem to find a good process of the raw data, to convert it to useful Information. Nowadays, even though we have had Many web analytics and visual statistics services which provided by some well Known companies like YAHOO and others; It is still dealing with maximizing the analysis And visualization output of raw

data. The YAHOO's former Director " Dennis R.Mortensen" written in his book: "you should spend \$10 on the web analytics tool And spend \$90 on people(the "the planet size brains" part of equation)." [1] it means Human Being's creativity to design an accurate filter of data is even more important

Than the tools or methods of data filtering to be used.

The term "Data Science" "(originally used interchangeably with "data logy") has Exist over thirty years and was used initially as a

substitute for computer science by Peter Naur in 1960. In 1974, Naur published Concise Survey of Computer Methods , which freely used the term data science in its survey of the contemporary data processing methods that are used in a wide range of applications. Perhaps, information system management is one of the areas which is

important. In this paper ;Since we are dealing with Data Science and Statistics Information . Therefore, any wrong data flow or assumption would cause wrong information for users. The system which had been designed in this paper is a Visual Statistics and Reporting System to analyses officer’s data in virtual office platform.

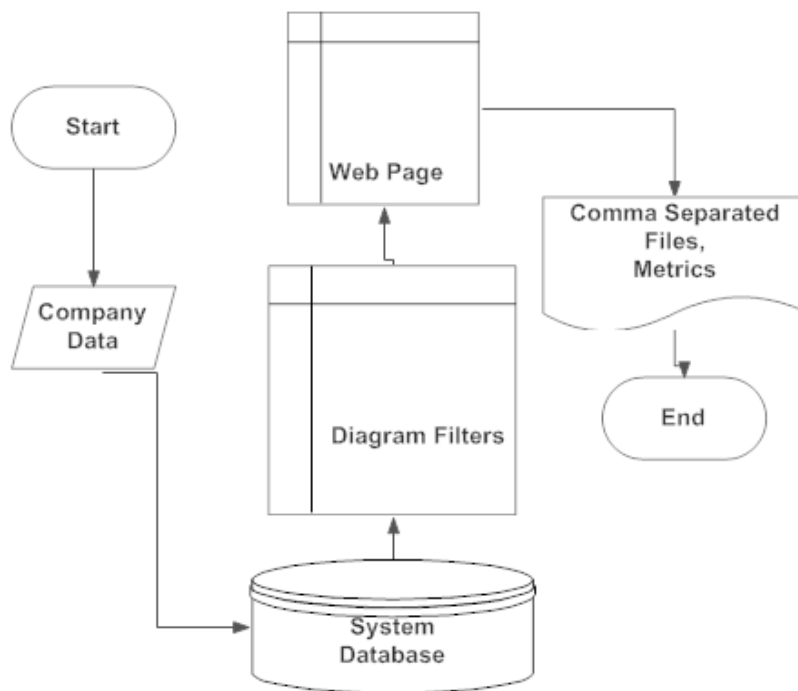


Figure 1-1 User Action Metrics Immersive Environment (UARMIE) Overview

**Project Objectives:**

The outputs of this project are the Visual Statistics and Reports which could be presentable information, or to be such a form which could be plugged in presentable

software. The target output would be the behavior of the company Personnel's daily work. These Outputs could be important within the company and Client Company's

Top Officials to evaluate their user's activities.

Some of the filters which designed as example:

- Attendance or Logs of users
- Total Time the Clients spend in the company
- Number of Tasks done by the users

#### **Constraints :**

Since, this system is going to be part of company platform; it should be compatible with the company infrastructure which includes its data storage, security requirement and business rules. Therefore, the system designed as web application in our case.

#### **Project Goals**

The goals of this project are:

1. To create a web application to fulfill the requirements of company which could be expanded as the number of company's clients increased.

2. To track specific authorized users which include:

- Individual Users
- Group Users,
- Organizations
- Forums

3. To develop a multi-tenant infrastructure where there is selective access of different users' data as they use the End User Metrics Reporting.
4. To develop a data visualization and reporting system, to be presentable by users.

One of the output's samples should be saved and documented using a .CSV (Comma Separated File) which could be accepted as a reporting output.

#### **Methods and materials**

##### **Project Plan**

##### **Planning-backlog:**

By using this planning method we determine the most vital part of the project which should be fulfilled as project planning

method. We named and divided the parts of project as stories, respectively from the

biggest to smallest and toughest to easiest part had been scheduled.

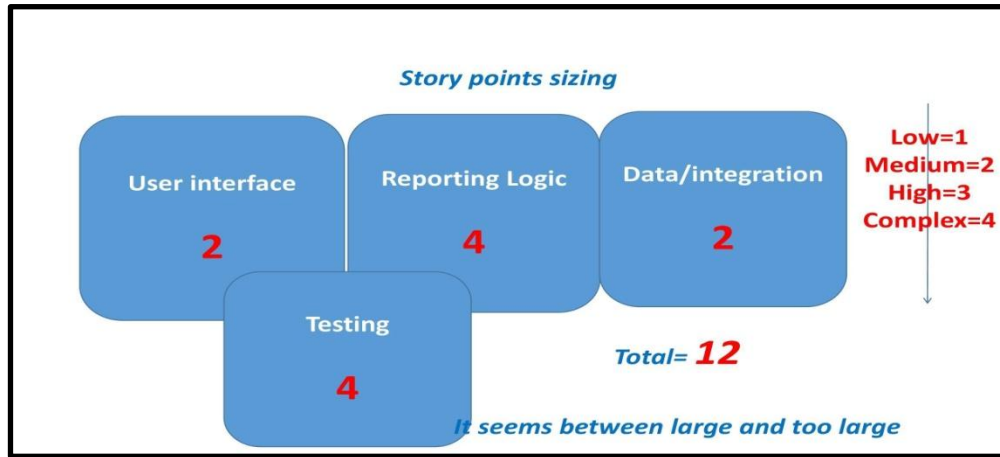


Figure 1.6. Priority of scopes

### Literature Survey

We believe that there are some essential features and elements in web analytics and reporting which every web analytic service should provide for their clients. Here are some of them which might be helpful for this project:

#### 1. Ad-hoc Reporting:

- Immediate and linear reporting
- Immediate and linear analysis
- Customer data selection
- Export platform linkage capabilities

- Simple format

#### 2. Pivot table report:

- Data viewing from multiple angles
- User's choice to analyze their desire data
- Trend discovering
- Ability to perform desired data comparison

#### 3. Responsive reporting to client's demands :

- Analysis of a portion of data
- High level business data representation

- Sorted data representation
4. Dashboards:
- High level data visualization (graphs, metrics)
  - Daily accessibility of data for decision making among company management and executives
  - Provide alert and warning of impending crisis in an organization
5. Ranking capabilities:
- Multiple way of ranking companies
  - Ranking over multiple times to keep companies motivated
6. Digging Reports:
- Digging the information as much as possible
  - Collaborative charts
  - Responsive data visualization (responsive graphs)

## Functional Requirements

Specific criteria which this system should track would be counted as follow:

### Tracking Targets

The initial functions would be focused on the system presenting an authorized user (Administrator) and basic activity tracking:

- user
- user group
- forum
- organization

### Target Activities

In addition to the tracking targets, there should be an ability to track the use of specific items such as reporting the metrics on:

- Clicking on a sign or item
- Getting a platform to choose the types of visual statistics

- Reporting the and average of certain data for reporting searched visual statistics purposes.

Filters :

The administrator should be able to utilize the initial filters where applicable within the Reporting Web Pages.

- Start and stop date and time for report and Visual Statistics
- Specific exclusion or inclusion adjustments to the target of the report, such as including the user's group except for specific users
- Set all, organization, organization/forum or user's filters or a combination of them.

### **Performance Capabilities**

#### **Report presentation**

#### **Max, Min, Average**

For most reports, it will make sense to provide the maximum, minimum

The Report specifics are as below:

### **Summary & Visualization**

- A. 24 hours a day time slot for filter purposes to be the selected target and location ( visual statistics representation )
- B. All Possibilities
  - Per days, hours, users and average per day
  - Login hours per day and its daily average
  - Per user or group sections
  - All logins over a time period
  - Total time logged in for all users selected
  - Total time used (sum of all users use time) per system,

organization,  
organization/forum

organization/forum  
specifics

C. Average login time for all  
users selected

- Specific on logins per user (responsive report)
- Average logged in hours per user
- Each login time and location, followed by each log out and location of logout with duration
- Per system, organization, organization/forum

- Per activity/item Artifact usage
- Yes/No selection with drill down on date and time per score if applicable
- Total number of times used (duration or clicks, etc.) by all selected users
- Average times used per user (duration or clicks, etc.) by all selected users

D. All of logins over the time  
period per system,  
organization,  
organization/forum specifics

- Average logged in time per system, organization,

### **Premium planning Special Reports**

For some clients, special reports might be required which requires tracking reports that tie an end user in the counselor group with a specific time.

## Interface Requirements

### First Release

The initial release of this system will support the following interfaces based on filters mentioned previously:

1. Basic Tracking Report (Webpage)
2. Admins Activity Report (Webpage)
3. Artifact/Activity Use Report (Webpage)

### Second Release

Updates to come after the initial capabilities could be provided by (Report Layout Concepts):

1. Webpage quadrant layout style with filters at upper left,
2. Summary of data at upper Right,

3. Scroll down date under bottom left and
4. Visualization of data at bottom right.

These web pages would consist of:

- Total of unique users who logged in during duration more than 5 mins
- Total number of logins for more than 5 mins during a specific duration
- The total time of all users that were logged in during a specific duration
- The average login time of users during a specific duration (Total Logins)





Figure 3.2. specific report output

## Results

### Survey Conclusion

According to review of different web analytic systems, it attempts to collect most effective applications which guarantee a successful analytic system. Here are some of them:

1. Easy and Responsive User Experience, GUI and data visualization
2. Platform with business prediction capabilities
3. Printable and representable report platform linkage to multiple digital environments

4. Selective presentation of data as there are a lot of important elements in virtual world.

### System structure

#### Database /Security methodology

##### Database methodology

Designing each part of the project should be carried out well by the developer with consideration to the project cost and time which are important criteria for each business infrastructure. There are two approaches based on the assumptions for database design which would be categorized as:

1. Shared approach: One or shared database infrastructure /shared database schemas or separate schemas.
2. Isolated approach: Many database infrastructure /Many database schemas

Since, the important criteria for our system are secure functionality of the project; therefore, it is better to separate the Clients Data Storages. The second approach had been chosen to have a better multi-tenant Data Structure which is Isolated Databases with Many database Schemas.

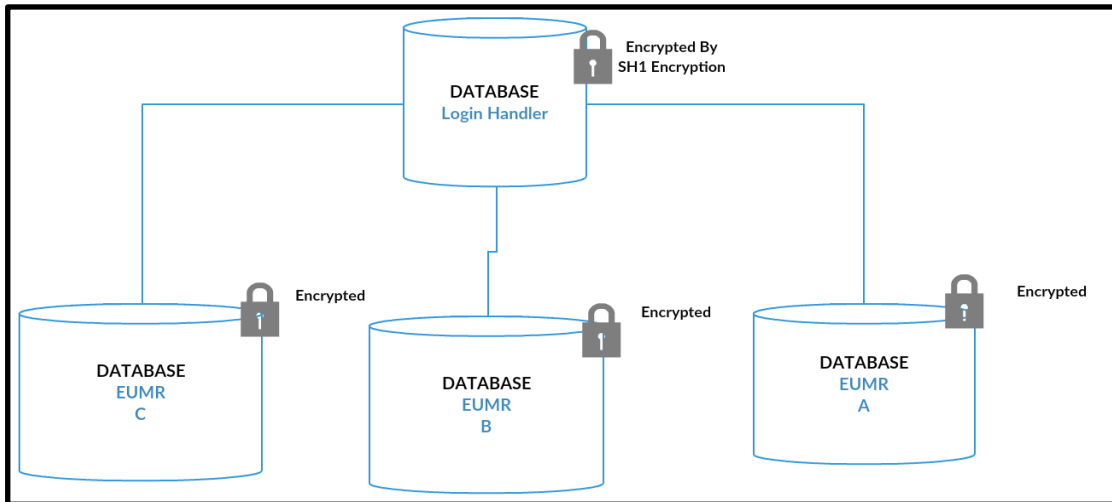


Figure 4.2. Isolated Databases with Encrypted passwords

In this approach, there is only one database for each company administrator to serve their customer analytics. There is another main database (Login Handler) as seen in Figure 4.1 which would handle all Signup and Logs.

### Security methodology

As we had chosen the data structure to be physically separated; we have partly secured the multi-tenancy of the user's data. However, it is always a good try to rely on the system's vulnerability instead of the attacker's strategies. To make this approach

happened, we chose the email authentication in passing the ID and Password of users by sending them with PHP Mailer which is the library made by Google. The reason why PHP Mailer is used is that many steps are needed to pass if one is trying to make his/her own email sender and receiver application. At the same time, almost all email service providers had secured themselves by these kinds of email.

The Security Levels which had been attempted for this project are:

1. Database physical separation with different authentication keys.
2. User's Authorization based on their authentication with the company
3. Passing user's new authentication of using End User Metrics by their email accounts.
4. Authentication checking of users by using Parameter Binding to avoid database injection.
5. Using Hash Function 160 bits encryption for password Encryption within the database

6. .

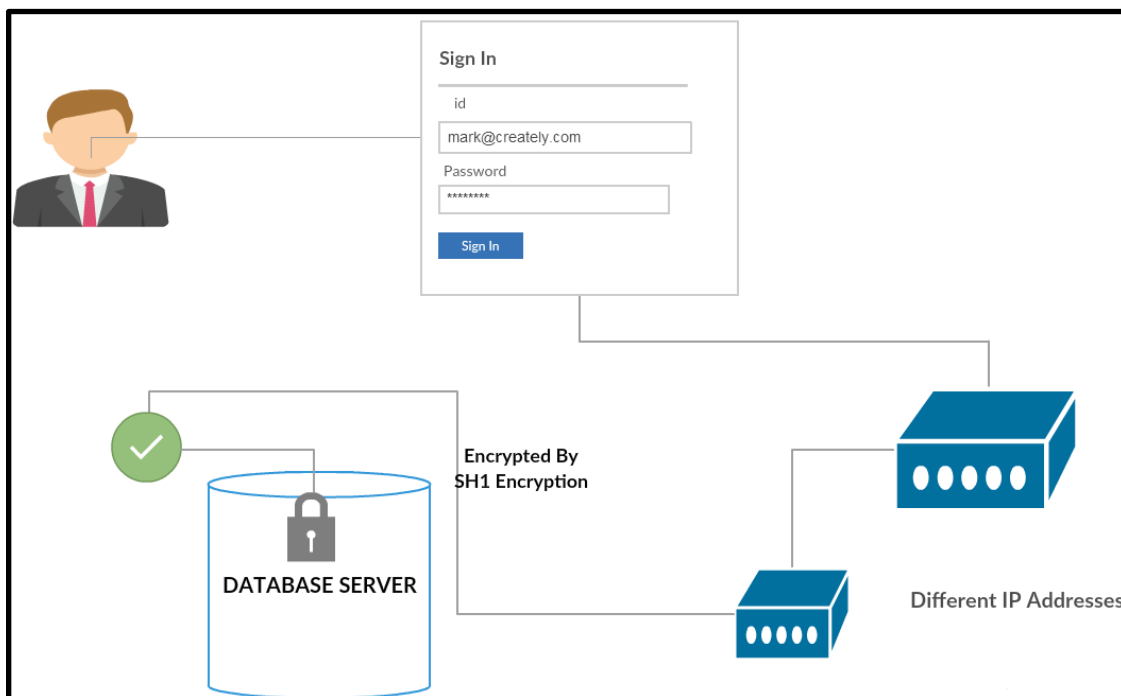


Figure 4.3. Parameter binding, to check user's Authentication

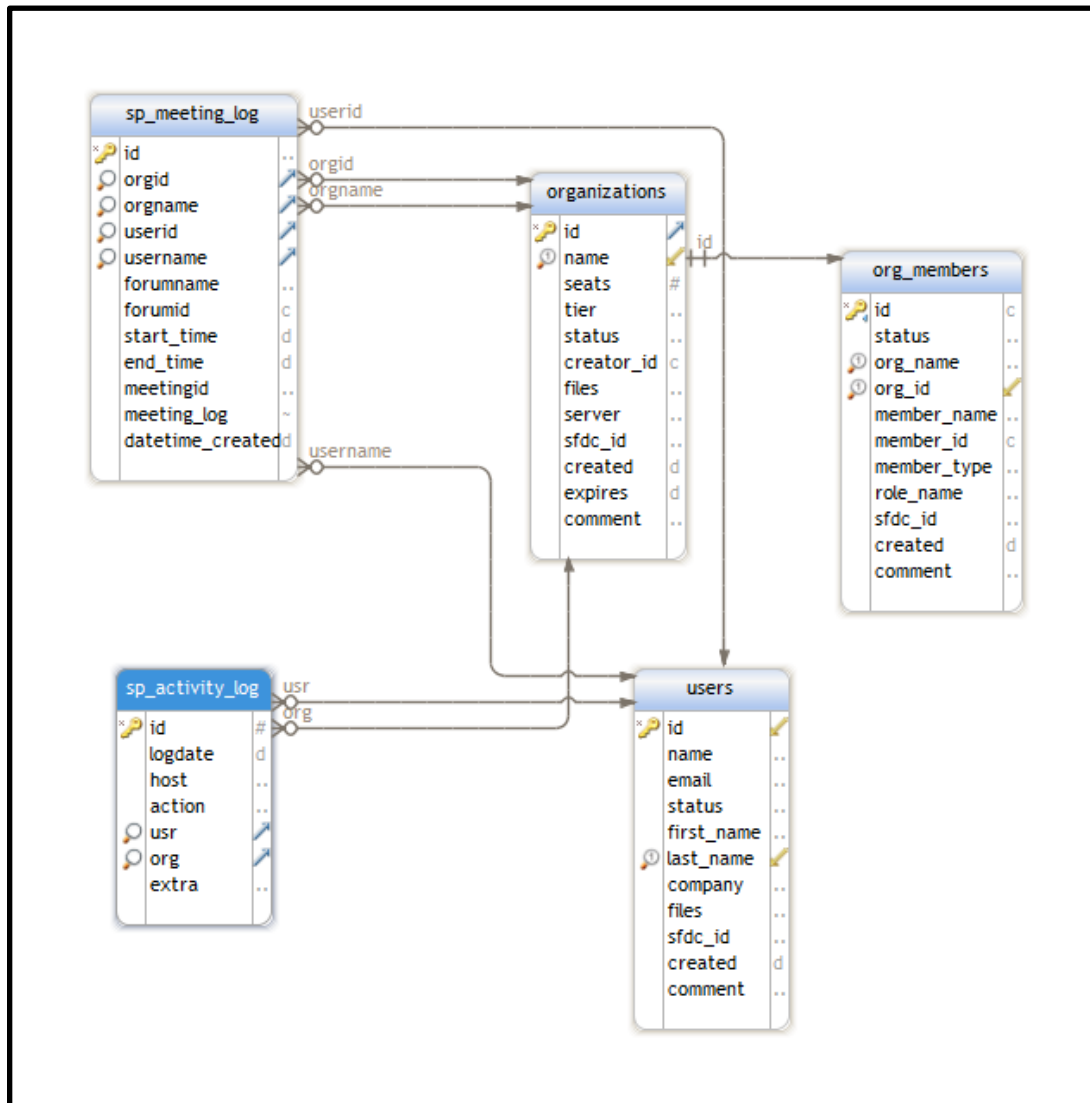


Figure 4.7. Entity Relationship Diagram Schema (Main Db)

### Conclusion

From the conclusion which might be gathered, for designing of the End User Action Reporting Model for Immersive Environment would be a set of functionalities, which had been designed to help companies for completion of their Data analytics and virtualization as a service. It

has the capability to compatible with kinds of data with different kinds requested filters to meet their clients need. Once they used this system as the backbone of their analysis, there might be a continuation in development and expansion of this system, based on their client's requests; therefore it

has the capability to be used for online or offline systems.

Since we had developed an expandable system that is built to meet client's requirement, it is an important matter to keep the clients and stakeholders updated. Continuous feedback might be needed to update the client's need and expectation from the End User Metrics System.

## REFERENCES

- [1] Dennis.R.Mortensen (Ed).(May,11,2009). (Yahoo! Web Analytics: Tracking, Reporting, and Analyzing for Data-Driven Insights Paperback)
- [2] Forbes-Gil Press (May 2013).(A Very Short History of Data Science)
- [3] Terf (3DICC)'S Web Site-3DICC .(2015).( <http://www.3dicc.com/>)
- [4] Eetu Kuneinen(March,27,2014).( <http://eethuu.com/google-analytics-10-pros-5-cons/>)
- [5] Clicky Analytics Company (<http://www.aboutanalytics.com/roxr-software/clicky>) Mocha Host - The Server used - (<https://www.mochahost.com/>)
- [6] PHPMailer-Email services- <https://github.com/PHPMailer/PHPMailer/blob/master/examples/gmail.phps>)
- [7] JSONP- <https://en.wikipedia.org/wiki/JSONP>
- [8] Web development-( <https://www.w3school.com>)
- [9] 17 Proven Website Hacks & Tricks – By Shock Media Studio
- [10] Php Development – ( [www.Php.Net](http://www.Php.Net))
- [11] Web Development – ( [www.Stackoverflow.Com](http://www.Stackoverflow.Com))
- [12] Pass Date Parameter To Highchart Line Chart – (<https://Blueflame-Software.Com/Pass-Date-Parameter-To-Highcharts-Line-Chart/>)
- [13] Highcharts – ( [www.Highcharts.Com](http://www.Highcharts.Com))
- [14] Intermediate JQuery Tutorial 5 – Learning Jsonp – (<https://Www.Youtube.Com/Watch?v=Oranyxl3uco>)

- [15] Database Security Issues –(  
  [https://www.oracle.com/data  
base/security/index.html](https://www.oracle.com/data-base/security/index.html))
- [16] Big Data – Nathan Marz And  
  James Waire – Chapter 1 To  
  Chapter 3
- [17] Interactive Data Visualization  
  For The Web – Book By Scott  
  Murray
- [18] Visualizing Data : Exploring  
  Data With The Processing  
  Environment – By Ben Fry
- [19] A Project Guide To Ux Design  
  –By Russ Unger And Carolyn  
  Chandler
- [20] “A Better Way To Learn  
  Angular 2” Tutorial –  
  ([https://thinkster.io/a-better-  
way-to-learn-angularjs](https://thinkster.io/a-better-way-to-learn-angularjs))