

Performance Appraisal System for Allion Technologies (PVT) LTD

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Abstract— The purpose of this paper to introduce an automate performance appraisal system for a software developing organization. Allion technologies used, manual form based performance appraisal system for assessing the performance and productivity of individual employees. This manual appraisal system generated several difficulties like data redundancy, data inaccuracy and delayed submissions of forms due to lack of communication through the system. The web based performance appraisal system is built to cover some of the crucial aspects of the system goals like administrator login and dynamic user creation, role base user access functionality, automating the excel sheet based performance appraisal process, designation based performance criteria handling, user rating interface and report generating and etc. This web base system allows, system users to access it and monitor it whenever it is needed avoiding the problems caused by geographical distance. The performance appraisal system has been developed over Intel(R) Pentium(R) CPU 2.00GHz, 3GB RAM, 320 GB Hard disk computer installed with Windows 7 home basic 64-bit OS, XAMPP and Yii PHP Framework for providing the MVC architecture ensuring a clear separation of logic and presentation. SQLyog Enterprise was used for handling the database tables, TortoiseSVN was used to have records of continuously made modifications to the system from its beginning. PHP, HTML, CSS, Java script, AJAX were used for coding. Adobe Photoshop CS3 and Adobe Dreamweaver CS3 were used for GUI creations. Entire system was tested to find out the errors of the system and performed necessary corrections. System was modularized and each module was tested in contrast to system requirements. System testing together with Given User trial proved automated performance appraisal system reduced almost all the manual processes dealing with the appraisal discussion and provided secure environment for rating process and minimize most of labour works currently done by staff members. Overall, the automated system enhanced the employee productivity and organizational growth.

Keywords— performance, appraisal, redundancy, automate, rating, productivity.

I. INTRODUCTION

Information and communication technology is widely exploited for many applications at present. There is a vast trend of computerizing almost all the processes for achieving higher performance, accuracy, reliability and so forth. Further machines are perfect of handling sensitive and non-sensitive data properly than manual handling by human hand. As a developing country in Sri Lanka, there is a rapid growth of computerizing most of the information systems in both government and private sector.

The web based performance appraisal system concept is convenient at time of talking as its highly valuable for measuring performance level effectively of each individual in an organization; employee performance is a major factor that affects to the success of an organization, when a performance appraisal system is web based and automated the outcome of the system is more reliable, accurate and efficient. Software outsourcing became more and more popular after 21st century started; at this moment software developing is a well-organized, stable and profitable industry in Sri Lanka. Allion Technologies (Pvt) Ltd is one of leading mid-sized software developing company in Sri Lanka. Proposed web based performance appraisal system for the Allion Technologies (Pvt) Ltd is expected to increase the productivity of the company by reducing the manual appraisal activities done by the management so far, securing them more time for other areas that need to be covered in the company.

II. MOTIVATION

Automating the performance appraisal process in an IT company like Allion technology (Pvt) Ltd has benefits for both company and the student who is trying to enter as a professional to the software developing field in future. Nowadays with the growing trend for IT related degrees, with the market demand for ICT specialists, the students need sound knowledge in web development techniques and data and information handling. It is a vital fact that students need to improve their skills by getting use of the learned techniques like Hypertext mark-up language

(HTML)/ cascading styling sheet (CSS)/Asynchronous JavaScript and xml (Ajax)/extensible mark-up language (XML)/animations/ JavaScript/ Web programming languages, managing DBMS and more in order to match their skills set with market demand. For this purpose, building a web based information system by supporting to automate existing appraisal process of a company and improving student skills through the development of such an application generate benefit to both student as well as the organization.

The proposed system seems to include adequate scope such that it can be customized to a vast range of employee based organization by adding required new performance appraisal criterions and rating levels required by each organization and domain, so that the system can be applied to a vast range of labour based organizations in health, building construction, plantation, mechanics, education, garments and factories sectors without much extra effort or customization.

For the companies that do not have an organized performance evaluation system, this will be the first foot step to streamline the process. With well-organized performance data, companies will identify the key team members/employees who should be treated well in order to drive the company towards success better than before.

If the appraisals are done routinely and precisely with measurement based analysis, without just going in to assumptions based on relationships and political factors inside an organization, it will encourage good workers to perform better as well as pressurize the lazy ones to be more active. This would certainly add value to both employees through career development and better compensation and benefits and also help the organization by improving the productivity and to expand its customer base, popularity and income.

III. ANALYSIS

A. Drawbacks of the existing system

- Data redundancy occur when one employee assigning to several performance appraisal cycles.
- Appraise and supervisor both cannot rate at once supervisor have to wait till appraises submission.
- There is no any alert or notification system through the performance cycle.
- Confidential data of the company can be accessed easily by unauthorized parties.
- Poor communication methods are used within the performance cycle.

- Time consuming paperwork and typesetting waste of paper and ink.
- High labor cost for managing the manual performance appraisal system.
- No backups for the confidential data.
- No proper appraisal record keeping procedures or documentation history.
- All the ratings are stored in structured paper documents, and those data may be prone to wear and tear and loss of data.
- Data can be changed adjusted, misinterpreted easily due to low security and easy access to information by third parties and the process may run under individual preferences, influences from administration, politics and etc.
- Time consuming to arrange separate appraisal forms, meeting and gathering the staff, late submissions etc.
- Quick decisions cannot be achieved due to lack of summarized data.
- Difficult to execute this manual process when employees are out station/abroad.
- Information is not properly maintained in long run for decision support.

B. Overall objective

The main objective of this project is to automate the manual appraisal process to build-up a more efficient and reliable system to overcome above mentioned drawbacks and fulfil following requirements.

- Facilitate the communication between employees and employer in performance appraisal discussions by organizing performance data and generating supporting documents.
- Provide facility to generate Central repository for organization performance data and work as a decision support system on long run.
- Support organizations to measure employee performance and generate individual and collective reports of employees without consuming huge document processing time.

C. Project Scope

Scope of the project was selected considering the time allocated for the project, client's requirements and resources available and the scope requirement of the degree program. The scope of web base performance appraisal system can be described as follows;

- Administrator login and dynamic user creation/user registering functionality.
- Role based user access functionality for confidential performance data to be in par with organizational hierarchy.

- Automating the excel sheet based performance appraisal process.
- Designation based performance criteria handling and evaluating.
- Generating suggestions for promotions on factual basis.
- Employee rating interfaces, and report generating for the use of both employee and management.
- Implementing the system in such a way that it's able to keep track of employee performance data within a period of time and generate reports and supporting documents for appraisal discussions held twice a year. (This period is customizable.)
- Identifying best performers with correct measurement base analysis without going in to incorrect assumptions on employee performance by discouraging high performers.

D. Similar Systems Study

Evaluate is a user friendly grading software giving the detailed evaluation of the performance, for educational as well as industrial organizations. What makes it attractive is its interactive privilege based model. It's easy to use structure permits the user to configure every detail he/she wants to add while using it for performance evaluation. The most appealing feature of this software is its ease to assess members with detailed analysis, which can be done via the automated grades generated by the software. This considerably reduces the manual effort involved in the process of grading.

Faculty evaluation system is based on schools/colleges/teaching institute's evaluation system which is generally paper based and now to avoid paper based system I have developed small web-based system. Open faculty evaluation system- This is Php/MySQL based faculty evaluation system which gives web based graphical report and excel file report. Users can manage branch, batch, faculty and their subjects. Students can give feedback in 0-10 rating. AJAX is used for filtration.

VI. PAS DESIGN DETAILS

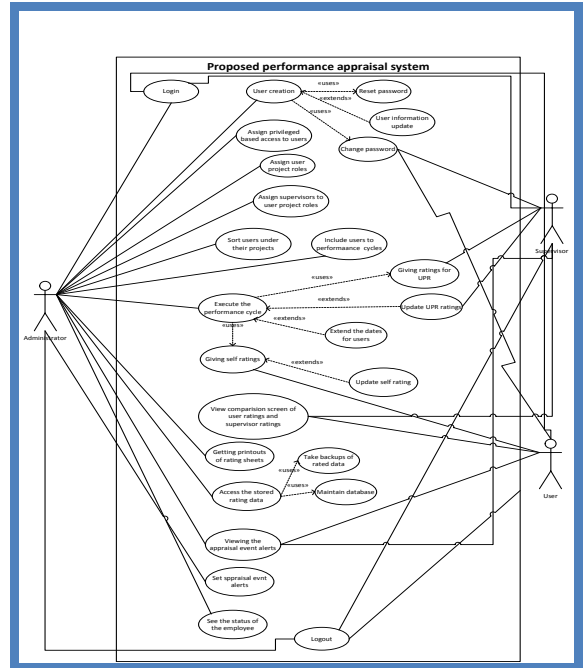


Figure 1.High Level Use Case Diagram for Proposed System

Limitations were noticed in manual appraisal system, and hence we were motivated to overcome these in our project. Figure 1 show, Use Case diagram covers the major system functionalities including administrator requirements, supervisor requirements, user requirements and it shows how the main actors interact with each use cases. Non-functional requirements like accuracy, consistency, security, reliability, usability, portability, timeliness, reusability and maintainability also were taken into account throughout implementation.

Figure 2 shows the connected database of the proposed performance appraisal system.

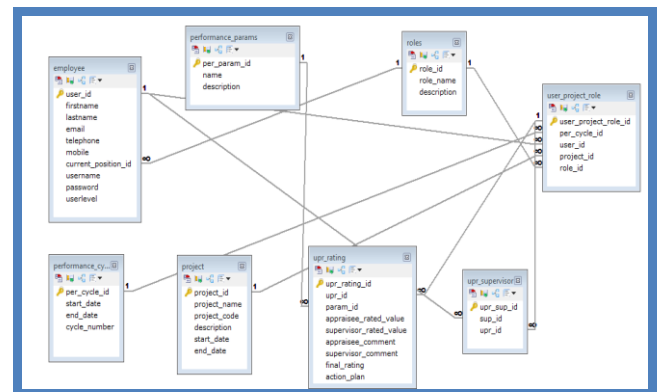


Figure 2. Database Design Diagram

Requirement specification were first identified and then carefully converted into a design that maps all the

requirements. The system has adapted the MVC framework which is being followed by most of the professionals in the IT industry which has a full capability to support rapid web application development and dynamic interactivity with the database as well. This also supports for the very special feature of OO - reusability. We used the Yii framework for building up the system, Yii is a free, open-source Web application development framework written in PHP5 that promotes clean, DRY design and encourages rapid development. It works to streamline your application development and helps to ensure an extremely efficient, extensible, and maintainable end product.

E. User Interface Design

User interface is the place where user mostly interacts within the system; Designing of the user interfaces is one of the major tasks in any system designing process. User interface is act as a bridge between human being and the computer system. As the Performance appraisal system has adapted with the MVC framework, where the system is divided into 3 distinct phases namely Model, View and Controller, the controller is used to string in more than one view files into one window and update them according to the model responses. Thus we need not to create that many interfaces like in traditional development, whereas we can simply reuse the codes by calling them at our convenience.

The major advantage of the MVC is that, we can manage presentation and logics separately; it gives us much clear environment within the system documentation. By changing OR adjusting the View we can accomplish user requests without interfering internal logics. Few main interfaces of the system have been illustrated below;

1) User Login Interface:

The following figure 3 shows the Login interface of the system and this is the primary interface that renders to all kind of the users before login to the system. Authorized users of the system are sent their user credentials via email when they are registered to the system by the admin, User are allowed to access by using his/her user credentials only and if entered username or passwords are invalid the access is denied by system and shows error messages meaningfully.

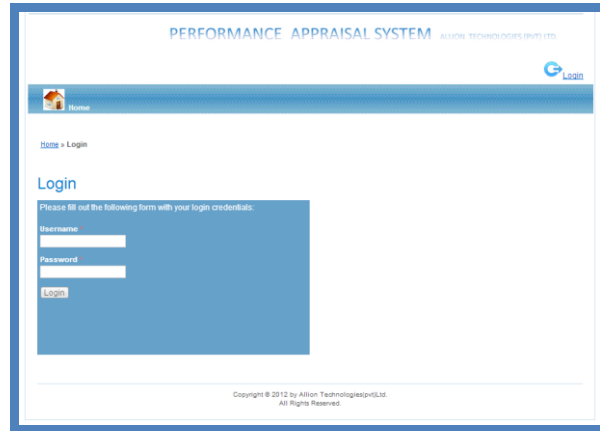


Figure3. System Login Interface

2) Home Page:

Below figure 4 shows the main interface for logged users, some modules of the menu can be different from user to user due to give privileges in the system. Basic functions of the system can be accessed through the home page effectively following the menus and links.



Figure 4. System Home Page

3) New user creation interface for the Administrator of the system:

Figure 8. User Creation Interface

4) *User Rating Interface:*

The below figure 5 shows the interface where Administrator executes the dynamic user creation functionality. Users are notified soon after they are registered via email through the system.

Rating	Meaning	Definition
5	Exceptional	Employee's performance excels in virtually all aspects of the job, having reached the ultimate in job performance on a sustained basis. Performance is of a rare quality found only in a small percentage of people within the organization. Performance is clearly recognizable as being consistently distinguished, which far exceeds all expectations of required job standards. Employee demonstrates a very high degree of expertise and saves as a work consistently superior. Consistently meritorious of excellence or coach to other employees. This level of performance merits special recognition and opportunities for particularly challenging assignments. The employee's performance compares with the best the company has seen. Quality of work is superior.
4	Exceeds Expectations	Employee's performance clearly and generally exceeds the criteria and standards required of a fully competent person. Performance is above the level expected in fulfilling job requirements and achieving goals and objectives. Employee demonstrates unusual proficiency in performing the difficult and complex aspects of the job competently and thoroughly, including extra or unique tasks assigned. Quality of work is superior.
3	Effective	Employee's performance meets the criteria and standards of job performance for practically all aspects of the job. Performance is steady, reliable and is maintained with a minimum of supervision. Employee consistently demonstrates the expected standard of performance that means accomplishing his/her goals and objectives as well as meeting all required job standards. Most employees would fall in this category. Quality of work is good.
2	Needs Improvement	Employee's performance usually meets the normal requirements in most of the job areas, but occasionally fails to meet minimum criteria and standards of job performance. Note - This rating would also apply to employees in the process of learning all the aspects of a role because they are either new to the Company or new to the role. Performance at this level requires some improvement in order to be considered good.

Parameters	Supervisor rated value	Supervisor comment
Technical Skills	No value entered	No comment entered
Productivity	No value entered	No comment entered
Teamwork	No value entered	No comment entered

Action plan for the appraiser:
No action plan entered

Figure 6. User Rating Interface

The above figure 6 shows the most important and major functionality of the system. The page content rendering is restricted for a logged user via given user privileges. The input fields are assigned ranges of values, for any kind of faulty entry input given an error messages through the system.

V. IMPLEMENTATION

Implementation is the phase of building up the actual system by coding and converting the identified system specification in the analysis and design phases into implementation logic so that, those are available as tangible components. The performance appraisal system for the Allion technologies (Pvt) Ltd was implemented with the support of contemporary professional system implementation tools. Chosen language for implementing the system was well practiced and familiar implementation tools were selected as it was easy to handle them when coding.

Some of new technologies were also used to manage the modifications made to the major code. The code was written and arranged in a readable and understandable format, along with comments for future modification support.

F. *Soft Ware Environment*

1) *Supported languages:*

The performance appraisal system has been developed using the following languages and technologies;

- PHP (Hypertext Pre-processor)
- HTML (Hyper Text Markup Language)
- CSS (Cascading Style Sheets)
- Java script
- Ajax (Asynchronous JavaScript Technology and XML)

2) *Supported Software and development tools:*

- Windows 7 home basic 64-bit operating system
- XAMPP version 1.7.1
- PHP 5.2.9
- Apache 2.2.11
- phpMyAdmin 3.1.3.1
- MySQL client version: 5.0.51
- Yii PHP Framework 1.1.10.
- SQLyog Enterprise7.02- SQLyog was used for handling the database tables.
- NetBeans IDE 7.0.1- NetBeans IDE was used in coding.
- TortoiseSVN 1.7.7- SVN was used to have records of continuously made modifications to the system from its beginning. It was useful

when needed to referring the previous version codes explicitly.

- Firefox, Google chrome and Internet explorer
- Adobe dreamweaver CS3
- Adobe Photoshop CS3
- Notepad

G. Hard Ware Environment

This system has been developed using a computer with the following configuration,

- Intel(R) Pentium(R) CPU 2.00GHz
- 3GB RAM
- 320 GB Hard disk

H. Reused Modules

- **PHPMailer** is a full featured Email Transfer Class for PHP; PHP email transport class featuring file attachments, SMTP servers, CCs, BCCs, HTML messages, word wrap, and more. It sends email via sendmail, PHP mail (), QMail, or with SMTP.
- **CompositeUniqueKey validator** is a Yii extension that is constructed for validate multiple values at once.

I. Codes of main Modules

Most of the code used for this performance appraisal system was written after referring many Yii documentations websites, forums and books. The following code list shows and list down some of the code fragments that are extracted directly to use in this project as they have better performing functionality and have tested by many users for given similar situations.

1) Database access via below code to the framework:

```
'db'=>array(
'connectionString' =>
'mysql:host=localhost;dbname=performance_system',
'emulatePrepare' => true,
'username' => 'root',
'password' => '',
'charset' => 'utf8'),
```

2) Login:

```
{ $model=new LoginForm;
// if it is ajax validation request
if(isset($_POST['ajax']) && $_POST['ajax']==='login-form')
{
echo CActiveForm::validate($model);
Yii::app()->end();
}
// collect user input data
if(isset($_POST['LoginForm']))
{
$model->attributes=$_POST['LoginForm'];
```

```
// validate user input and redirect to the
previous page if valid
if($model->validate() && $model->login())
$this->redirect(Yii::app()->user->returnUrl);
}
// display the login form
$this->render('login',array('model'=>$model));
}
```

3) User authentication

```
{
$record= Employee::model()-
>findByAttributes(array('username'=>$this->username));
if($record===null)
$this->errorCode=self::ERROR_USERNAME_INVALID;
else if($record->password!==md5($this->password))
// else if($record->password!==$this->password)
{
$this->errorCode=self::ERROR_PASSWORD_INVALID;
}
else
{
$this->_id=$record->user_id;

//$this->setState('title', $record->title);
$this->errorCode=self::ERROR_NONE;
}
return !$this->errorCode;
}
{
if(!$this->hasErrors())
{
$this->_identity=new UserIdentity($this-
>username,$this->password);
if(!$this->_identity->authenticate())
$this->addError('password','Incorrect username or
password.');
```

4) Logout:

```
{
Yii::app()->user->logout();
$this->redirect('?r=site/login');
```

VI. EXPERIMENTS

Testing is done to ensure whether the system is working properly and to find and correct if there found any faulty (software bug) implementations. System was modularized and each module was tested. Every single part of the system was twice checked, input data errors, processing errors, output results errors, whether given links works properly, authorization conflicts, validation errors, update, delete, save button functioning, were tested in contrast to system requirements/goals. The following table shows number of test cases used to conduct testing each module;

Table 1. Test Cases

Module	Number of Test cases performed	Status
Employee	11	PASS
Project	07	PASS
Performance parameters	06	PASS
Employee Designation	06	PASS
Performance cycle	06	PASS
Assign, user project role	06	PASS
Assign user project role supervisor	06	PASS
Rating	12	PASS
Overall test cases		100%

A. User acceptance testing

The system was tested by the QA team guided by General Manager of Allion Technologies (Pvt) Ltd in their working environment whether the performance appraisal system was completed with required functional and non-functional requirements as they expected from the system. Final result of the user acceptance testing was the system is perfectly performing its requirements and it is well suited and in standard state for using within the company environment. In addition they mention by the system they can perform their performance appraisal process very efficiently and timely.

VII. CRITICAL PROJECT EVALUATION AND FUTURE WORK

A. Critical Project evaluation

When comparing with the studied automated appraisal system in the literature review (e.g. eValue) it was not found that this much of information handling is supported by the system administrator and also the application was not well structured. It is an achievement of clearly understanding the domain and the core functions.

It is introduced as an advance feature, the auto generated password feature for the users who are created by the administrator. Login credentials are automatically sent to the newly created users to their mail accounts, enabling users to modify passwords for the security purposes. Users are able to retrieve a new password informing the system administrator when self-account is not accessible or password is forgotten. System security was highly concerned as it was for real time working and protecting the privacy and confidential data of each employee including the company itself was very important. It was a crucial requirement that need to be implemented overcoming the existing systems currently. Documents printing facility is advantageous feature of this system with comparing with other studied

systems. Validating each and every input data that goes in to the system is important for maintaining the reliability and accuracy of the data. Most of the systems are involving with grading 0% to 100% method. In the performance appraisal system for Allion technologies it is introduced to input decimal values in the range of 1 to 5 with standard measuring instructions in each appraisal sheet and average value at the end.

B. User interface Design

Initial design methods and application were emerged to the system; according to my opinion the system user interface could be developed more user friendly by using graphics/css/styles.

A. Multiple User assigning facility

In the built system it was given the ability of assigning one supervisor at once to a user project role, but it could be further improved by giving multiple supervisors assigning ability.

B. Data analysing tool with rating

As this is a kind of a system that retains historic performance data, it is worth providing analysing tools such as graphs, charts and other analysis methods for giving a clear presentation of the entered and processed rating data.

VIII. CONCLUSION

The automated performance appraisal system concept was suggested by the company administrative team aiming an efficient appraisal process within the company. It will be another achievement for Allion to organize their working environment in a standardized and efficient manner. Scope of this system was sketched in a point form and communicated. After some discussions it was clear that this system is going to cover a reasonable scope that can be released in couple of versions in the future.

Along all the stages of this project it was revised and compared with client requirements and domain of the subject area to ensure whether the system is targeting to its success. Through this automated performance appraisal system it will reduce almost all the manual processes dealing with the appraisal discussion. It will also provide secure environment for rating process and minimize most of labour works currently done by staff members. Overall, the system enhances the employee productivity and organizational growth.

The major functionality of the system is the user project role rating; other supporting functionalities are related in several indirect ways with the major one, Most of the

system functions are dealing with the system administrator except the major rating functionality. The system was tested with several test cases to check whether the client requirements are fulfilled or not, test results demonstrated that it works fine. Through the user acceptance testing the system was tested for various situations and succeeded.

User interface is quite simple and easy to use by having only a short training/demonstration to all the employees of the company, also it is given in the user manual.

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