An Undergraduate Internship/Project on HRIS Module

(Employee General & HR info)

OF
Integrated Online Application System (IOAS)

By

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Spring,2021

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May 10,2021

Dissertation submitted in partial fulfillment for the degree of Bachelor of

Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

I, hereby declare that I have provided all the original work of my project in this report and I will stand by it.

Signature Date

Write Your Name Here

Name:Raihana Tanjil
Date:10th May,2021

Acknowledgement

I would firstly like to thank The Almighty Allah for giving me the endurance and the ability to work hard, for giving me the ability to write this report to and for giving me the chance to be able to do my internship at TechnoVista Limited. Also, my parents for their unconditional love and support that have sustained, nurtured, and got me ready for this challenge. I would like to thank my honorable faculty and supervisor Md. Sanzar Adnan Alam, Lecturer, Department of Computer Science Engineering, Independent University, Bangladesh, for her invaluable guidance, patience, time, constructive criticism and thoughtful advice regarding various aspects of my internship and preparation of this report. I would like to thank my senior coworkers Mr. Mohammad Abu Taher(sr.Manager), and all the others who made me feel at home from day one in the company and helped me navigate throughout the projects. And I would like to thank Mou Chowdhury for the sincere guidance in the project. I am thankful for the continuous guidance and support along with the vast pool of knowledge which was key for the completion of the project.

Lastly, I would like to acknowledge my external supervisor and my mentor Mr. Mohammad Abu Taher for appointing me as an Intern for TechnoVista limited and include me to be a part of this company. Without his extreme energetic support and guidance, I could not finish the project successfully.

Letter of Transmittal

25th April 2021

Sanzar Adnan Alam

Lecturer,

Department of Computer Science and Engineering,

Independent University, Bangladesh

Subject: Letter of Submission for Internship Report, Spring 2021

With due honor and respect, I, Raihana Tanjil, from Spring 2021, Section 08, would like to submit my Internship report. This report is written to kindly inform you that I have completed my internship program and its report. My internship was conducted from 10th February to 25th April 2021. I completed my internship at TechnoVista Limited.

This report is based on my experience and the work I did at TechnoVista Limited during my internship. The primary goal for my internship was to gain experience in all the different technology related fields of the company, including research and documentation, software development, and to get acquainted with Quality Assurance processes and practices with emphasis and priority on understanding how a software is being built rather than what is being built.

Over the period of my internship at TechnoVista Limited, I found out that I learned and applied a lot of new skills and technologies. The company comprises of a small team of software craftsmen who learn, collaborate, and innovate together. I hope the following report can achieve your approval and is up to the mark.

Sincerely,

Raihana Tanjil,1621198

Email: Raihana.bd90@gmail.com

Evaluation Committee

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Signature

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Name

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Supervisor

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Internal Examiner

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Convener

Abstract

In the CARE Bangladesh HRIS Module of (Employee General and HR Info.) IOAS I was assigned to do one particular part of the project. The Quality Assurance and find out the bug manually.

This report discusses my experience as a Quality Assurance Intern at TechnoVista Ltd. . My responsibility was to find out the software bug manually and Technical Proposal and analyzing the requirements and making a Excel file for developers. The report described all the processes from planning requirement analysis, development, physical and the bug finding process of the software. Finally, I described what we achieved and what our plan is for the future.

Contents

Chapter 1

Introduction

1.1Overview/Background of the Work

This module prepares and manages detail employee general info, personal profiles, employee HR information, and HR Actions, etc. This module is integrated with other modules of the proposed software. The system will manage the personnel directory for all personnel of CARE Bangladesh. The system also will manage each personnel's life cycle. The system administrator will do the configuration of the system. It will help to prepare all kinds of human resource management information tasks very easily and properly. The system will preserve all the information's in a secure and organized way so that any authorized user can view and use the information effectively.

The proposed software automated the business process and the administrative activities of the HRIS system. The software automated the employee general & HR information, all types of HR Action for an employee, Promotion, Transfer, Re-Designation, Disciplinary Action, Temporary Duty Assignment, Acting Duty Assignment, Confirmation, Contract Extension, Employee Separation, Re Hired, and other related information, etc.

The proposed solution will be able to generate all required reports of each section. The provision should be there; so that the authorized user can generate her/ his required reports by selecting the parameters for each feature.
Different level of security is applied to the proposed system. Only authorized user can be entered into the system and will be performed based on the privilege. All of the features access privilege can be assigned with Add, Update, View & Delete facilities. If any user enters into the system with view privilege then s/he can view information only.
There are following sub modules which are combined as Human Resource Information System (HRIS)-

1. Employee General & HR info
2. Leave Management
3. Performance appraisal

4. Training
5. Health insurance
6. The following major features will be covered in this Employee General & HR info sub module.

- Different setup information like designation, Organogram, common configuration, etc.
- Employee General Information.
- Employee marital, spouse, and children information
- Employee Emergency skill/Experience.
- Grade level wise Pay Structure
- Employee Education information
- Employee HR Information
- Nominee Information
- Retirement Age Setup
- All Types of Letter Template
- Employee Transition - Promotion, Transfer, Re-grading & Re-Designation.
- Project Transfer
- Disciplinary Action - Advise/ Warning/ Suspension
- Temporary Duty Assignment
- Acting Duty Assignment
- Extension of Acting Duty Assignment
- Confirmation
- Contract Amendment
- Probation Extension
- Employee Separation - Closing of Contract, Retirement, Dismissal, Death etc.

- Re-Hired
- Salary Amendment
- Approval Flow Information
- External CV Entry

Personnel Confidential File Handling

1.2 Objectives

Syncs the data of the cloud to the database application: The application serves as a medium for people/facilitators to input the recorded data of the survey.
Controls and accesses the survey information: The application serves as a medium for the admin to control and access the input information provided by the facilitators in order to monitor their work Generates and monitors the progress reports.

At present, the CARE team maintains their HRIS process-related activities through an existing web-based solution and various documents, and therefore working with this semi-automated process and preparing reports for higher management is a complicated process. Hence, effective and efficient functioning of the employee general & HR information management has become difficult and time-consuming matter. There is a potential risk of error because of this semi-automated processing of information. To reduce the manual tedious job and improve operational efficiency along with the availability of data in the quickest possible time, CARE Bangladesh needs to develop an integrated Human Resource Information System.

1.3 Scopes

The following are the expected benefits that will get:

- Leading to greater office efficiency
- Reduces costly and time-consuming administrative tasks.
- Automated processes to smoothen the work-flow
- Reduces HR transaction time.
- Leading to organizational effectiveness

- Officers/ Staff can spend fewer resources on managing administrative activities.
- The free time and resources can be concentrated on strategic issues, which lead to more success in the organization.
- Save time and work more effectively.
- Reporting can be easier.

Chapter 2

Literature Review

2.1 Relationship With Undergraduate Studies

Independent University, Bangladesh, offers an array of courses that have helped in the Employee Info. & HR System creation process. The courses, in no particular order, are as follows: -

CSE 307, System Analysis and Design: This course provides an overview of the various SDLCs and how the project can be adopted by each of them.

CSE 458, Software Quality and Testing: This course provide Software quality assurance (SQA), review of SQA practices, quality management, the role of SQA, the SQA program planning, launching and management, independent verification and validation; software inspections, basic principles, reviews, reporting and tracking, managing inspections and reviews; principles of software testing, testing types, test planning, development, execution and reporting; real-time testing and test organization; basic concepts of reliability, modeling software reliability from test results, techniques for analyzing, predicting, designing, and engineering the required and expected reliability of software systems.

2.2 Related works

Labor Inspection management Application (LIMA), Department of Inspections for Factories and Establishments (DIFE) is a department under the Ministry of Labor and Employment responsible for ensuring welfare, safety, and health of people working in various sectors of the country.

We created an intuitive application for the database that records all case profiles with supporting documentation, enabling users to prepare a different collection of running reports.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

HRIS Module (Employee General & HR Info.) Of Integrated Online Application System

Development of the Software Requirement System (SRS) of the system. Development of the overview of the system. Development of monetization plans.

Development and finalization of Security Requirements Development and finalization of Quality and Testing Requirements Design.

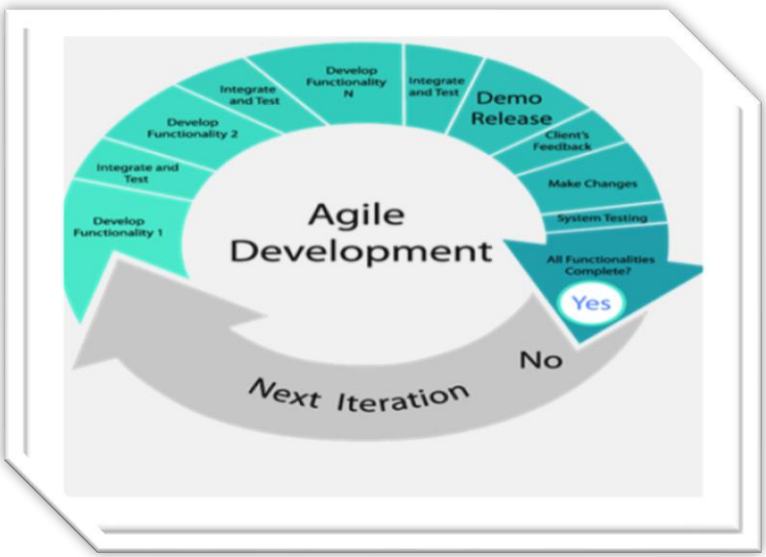
Development of Data Models Bug fixing and issue resolution Finalize Development and UI Testing and integration of all modules Integration of all modules Configuration of the modules Operational, functional, and integration testing cycles Coordination of bug-fixing/issue resolution Finalize Testing of features.

Production Deployment Publishing formalities Release the version Project Support Future planning Future review meetings Progress Reporting.

Chapter 4
Methodology

SOFTWARE DEVELOPMEMT METHODOLOGY

Agile development consists of iterations. This means, the software owner receives a viable piece of software at the end of each iteration. First it's the design of the future product; then is launched the development, where the product receives new features and gets tested, iteration by iteration. Besides, the software owner can track the progress of development by receiving timely reports. Furthermore, this allows the owner to shape the picture of the app by giving feedback and altering requirements. Requirements to develop a software tend to change. Vision and strategy change. Users may demand new features or pay less attention to other "useless" features. These unexpected changes may cause certain delays and overpays to be realistic. Experience shows that initial requirements do change. These requirements may vary from insignificant ones to those which require rewriting quite a bulk of code. Agile method adds more room for change/improvements. As agile developer, we keep track of the altering/improving the Agile development model is a type of incremental model. Agile software is developed in rapid and incremental cycles resulting in small incremental releases. Each release is thoroughly tested to ensure that software quality is maintained. Agile software development is a process for developing software. "Agile" project management is an umbrella term that covers many different kinds of software development. There are some strategies that should follow Agile Method to fulfill the project to the end.



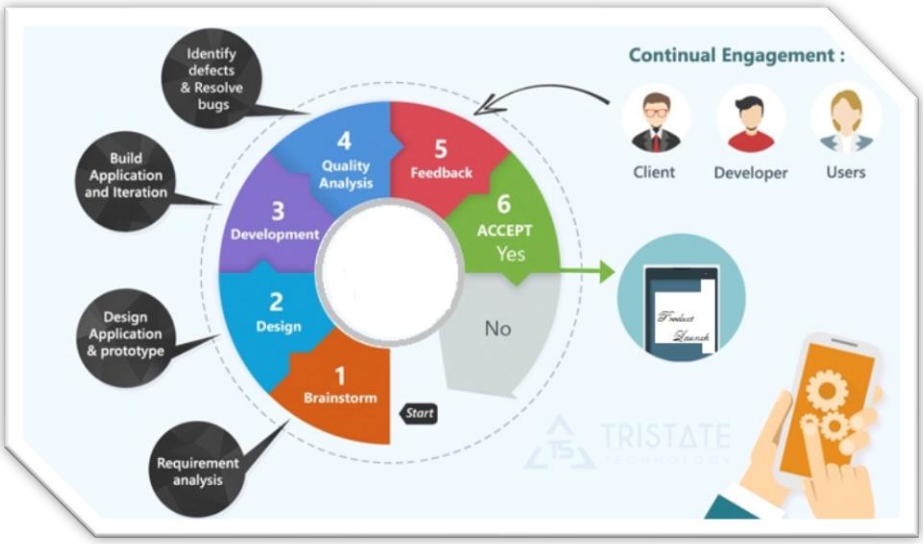
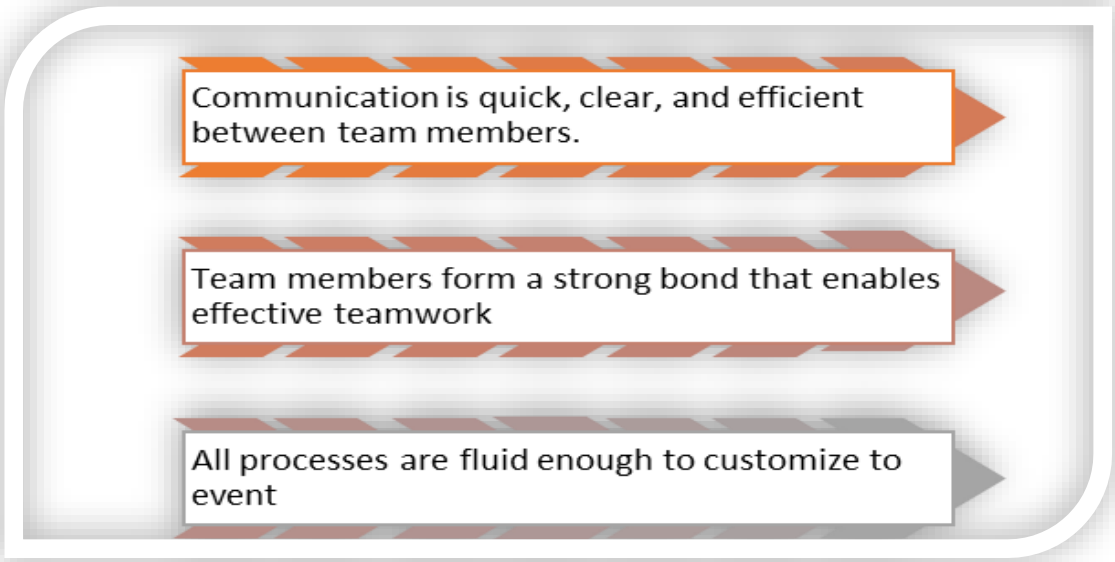
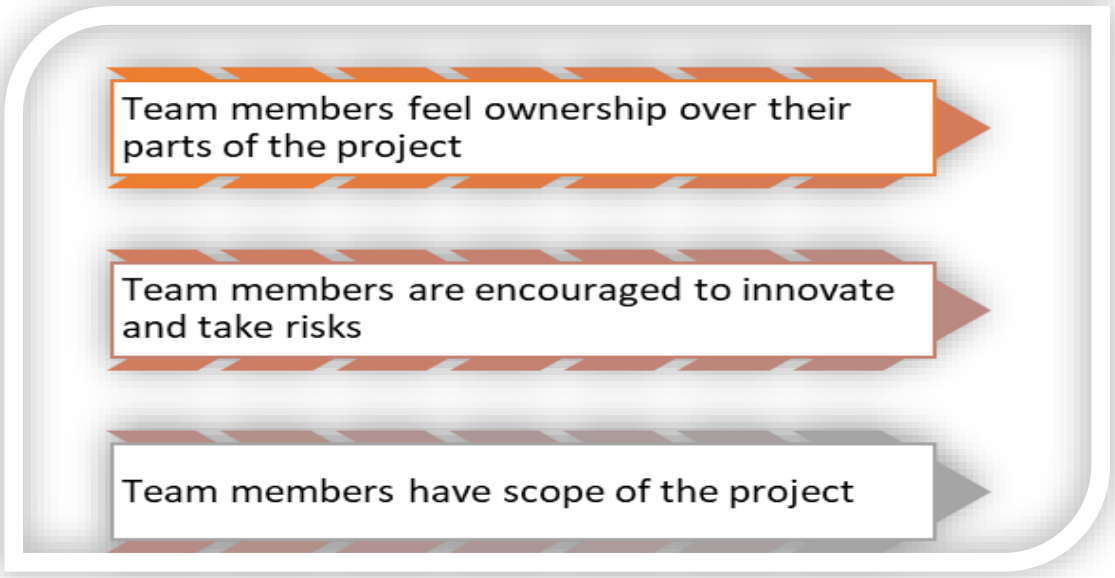
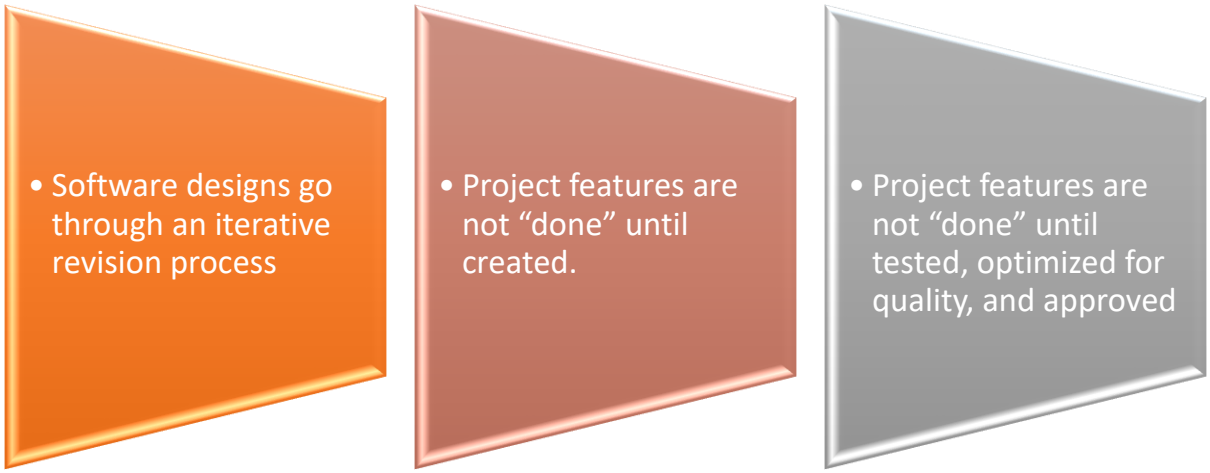


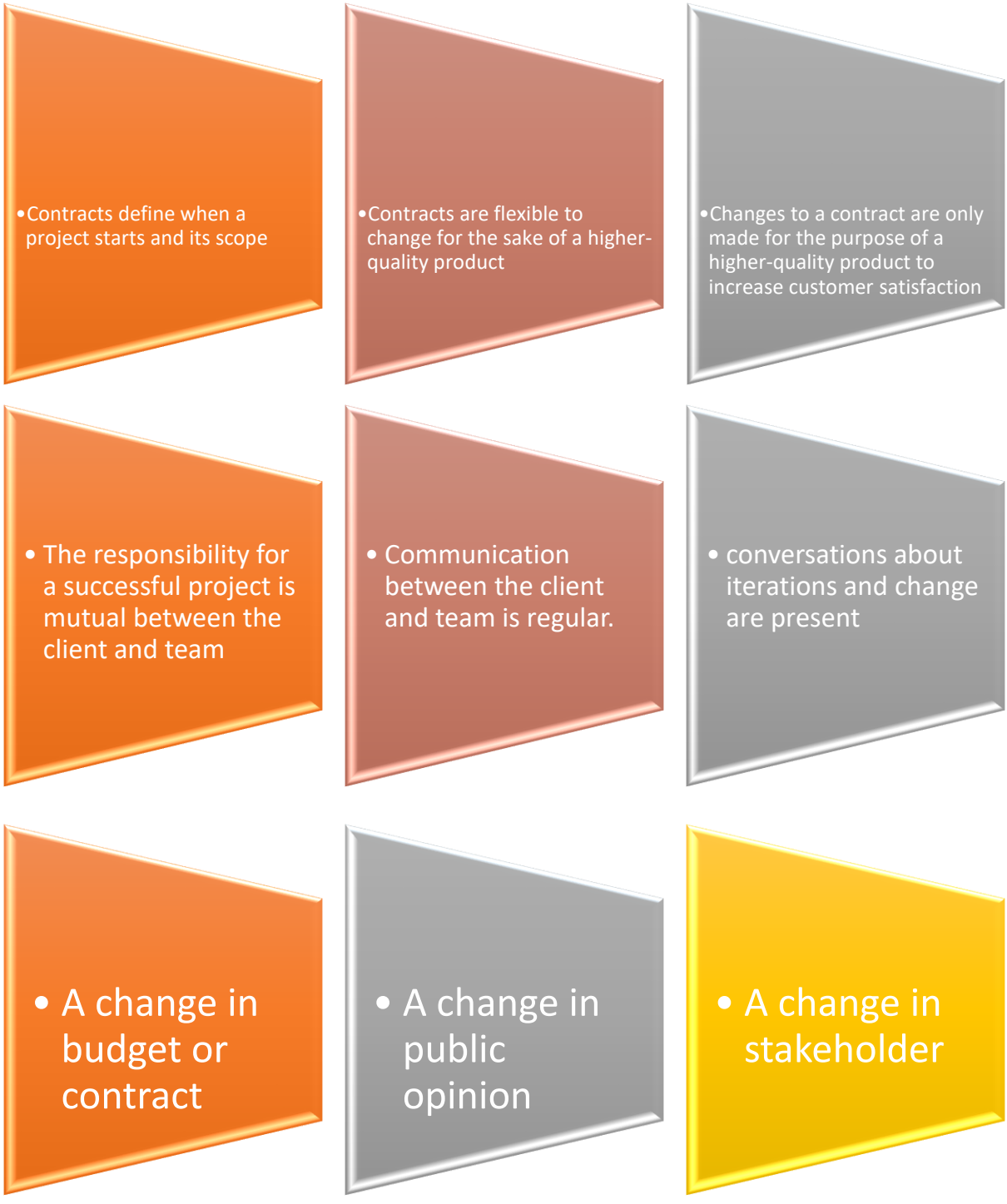
Figure: Software Development Planes

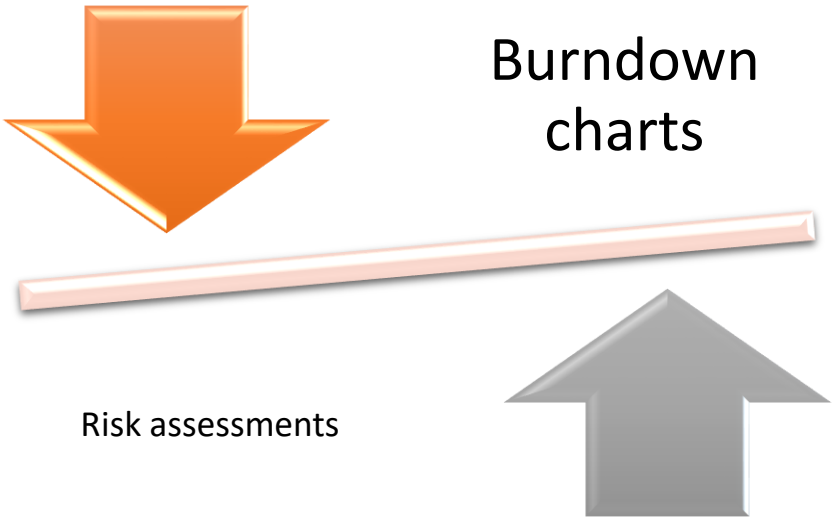

Communication is quick, clear, and efficient between team members.
Team members form a strong bond that enables effective teamwork
All processes are fluid enough to customize to event


Team members feel ownership over their parts of the project
Team members are encouraged to innovate and take risks
Team members have scope of the project

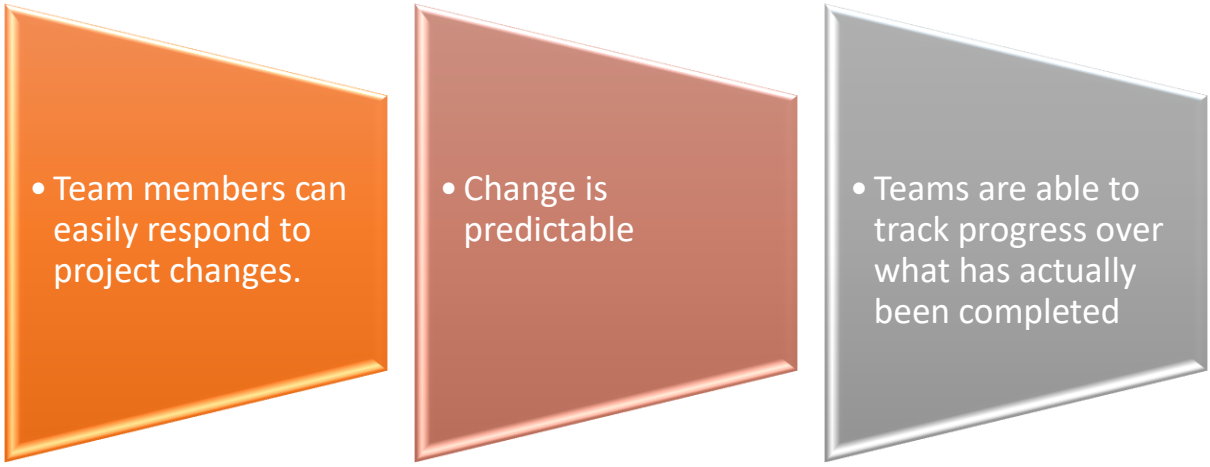
Working on software over some comprehensive documentation:




•Contracts define when a project starts and its scope
•Contracts are flexible to change for the sake of a higher-quality product
•Changes to a contract are only made for the purpose of a higher-quality product to increase customer satisfaction
• The responsibility for a successful project is mutual between the client and team
• Communication between the client and team is regular.
• conversations about iterations and change are present
• A change in budget or contract
• A change in public opinion
• A change in stakeholder



Agile aims to give team members the tools to prioritize, plan, and work through any unforeseen changes. Agile team adhere to this value, the following are the ideal outcomes:



AGILE TESTING STRATEGIES

Agile testing life cycle spans through four stages:

ITERATION 0

During first stage or iteration 0, you perform initial setup tasks. It includes identifying people for testing, installing testing tools, scheduling resources (usability testing lab), etc. The following steps are set to achieve in Iteration 0.

Establishing a business case for the project

Establish the boundary conditions and the project scope

Outline the key requirements and use cases that will drive the design trade-offs

Outline one or more candidate architectures

Identifying the risk Cost estimation and prepare a preliminary project.

CONSTRUCTION ITERATION

The second phase of testing is Construction Iterations, the majority of the testing occurs during this phase. This phase is observed as a set of iterations to build an increment of the solution.

Construction iteration is classified into two solution

RELEASE END OR TRANSITION PHASE

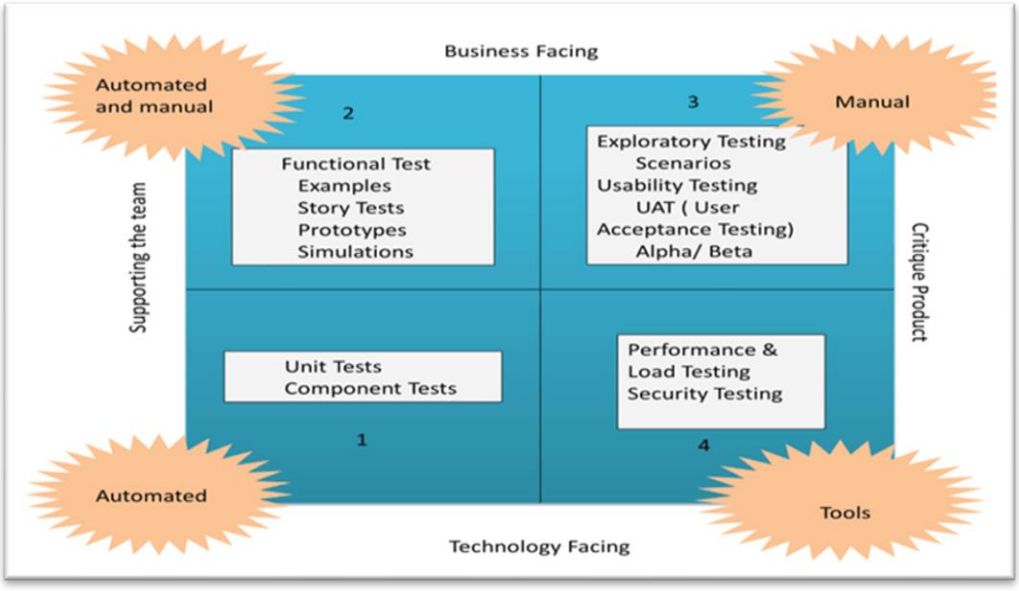
The goal of "Release, End Game" is to deploy your system successfully into production. The activities include in this phase are training of end users, support people and operational people. Also, it includes marketing of the product release, back-up & restoration, finalization of system and user documentation.

The final testing stage includes full system testing and acceptance testing. In accordance to finish your final testing stage without any obstacles, you should have to test the

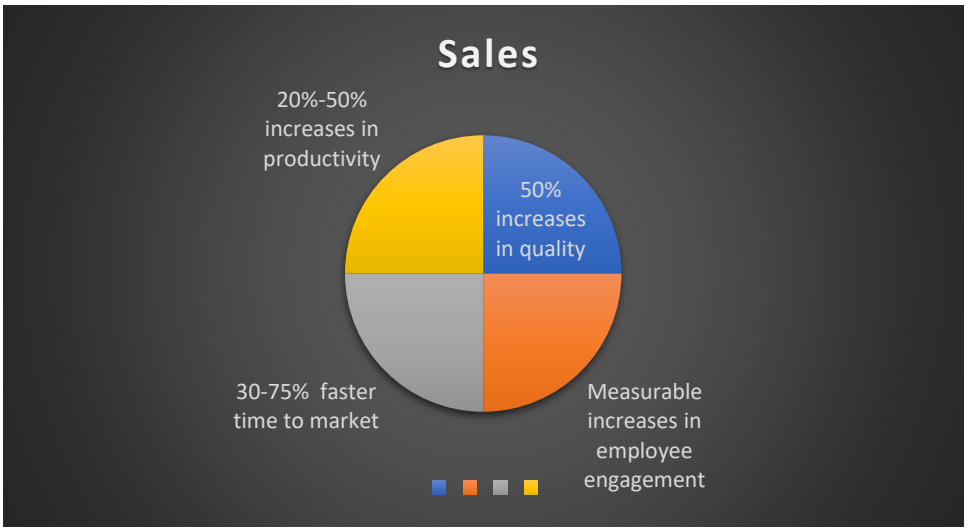
product more rigorously while it is in construction iterations. During the end game, testers will be working on its defect stories.

PRODUCTION

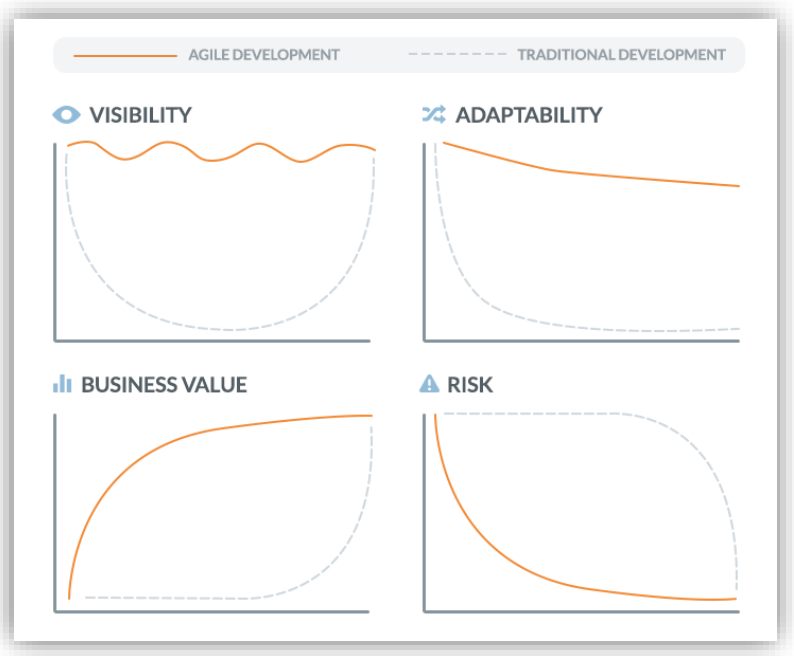
After release stage, the product will move to the production stage.



Why Use Agile?



AGILE JUSTIFICATION



Agile development is vast. This graph shows how agile is better than other methodology. The visibility the adaptability the business value and also risk are so better than other traditional methodology.

Chapter 5

Body of the Project

5.1 Work Description

Requirement Collection and Analysis is one of the most critical phases in software development life cycle, which is the most communication intensive phase with the User Group. We proposed to identify the Software requirements through a prototyping approach. The user group will be actively involved in providing information to identify modification and enhancement requirements. It is also helpful to eliminate chances of misunderstanding. The task of this step will be as follows:

1. Study and understanding the existing system

2. Determine scope and objectives

3. Determine information based on the current procedure

4. Identify information processing needs and performance

5. Identify sensitive information which requires more security

6. Outline user and management requirements

7. Outline Software and constraints requirements

8. Identify client interface requirements

9. Specify security requirements

5.2 System Analysis

5.2.1 Six Element Analysis

Process	System Roles					
	Human	Non computing hardware	Computing hardware	Software	Database	Comm. & Network
View Login Panel	User	N/A	laptop/desktop/smartphone	Web browser	MySQL Database	WAN/ LAN
Log in	User	N/A	laptop/desktop/smartphone	Web browser	MySQL Database	WAN/ LAN
Import CSV File	User	N/A	laptop/desktop/smartphone	Web browser	MySQL Database	WAN/ LAN

Process	System Roles					
	Human	Non computing hardware	Computing hardware	Software	Database	Comm. & Network
View All Data	Admin	N/A	laptop/desktop /smartphone	Web browser	MySQL Database	WAN/ LAN
Search for Organization & Upazila	Admin	N/A	laptop/desktop /smartphone	Web browser	MySQL Database	WAN/ LAN
View User activity	Admin	N/A	laptop/desktop /smartphone	Web browser	MySQL Database	WAN/ LAN
View entry-wise report	Admin	N/A	laptop/desktop /smartphone	Web browser	MySQL Database	WAN/ LAN
View trend report	Admin	N/A	laptop/desktop /smartphone	Web browser	MySQL Database	WAN/ LAN
View Progress report	Admin	N/A	laptop/desktop /smartphone	Web browser	MySQL Database	WAN/ LAN

5.2.2 Feasibility Analysis

Both Admin and Employee General information variables are included in the feasibility analysis of Employee & HR Information of IOAS . The comparative approach considers all possible options and then assesses them against particular parameters in order to eventually find the best one. In general, the HR management conditions in a specific office have a direct effect on the head-office. Therefore, the viability of the employee info. needs to be assessed as well.

5.2.3 Problem Solution Analysis

The google column charts did not display the percentages that were strictly put as a requirement by the client.

Solution- we had to set a parameter by using javascript in order to set the percentages so that when the reports are viewed the percentages were displayed while generating the report

The client had provided the color scheme for each of the columns in the report which was not recognized by google charts and hence was providing a wrong/darker color.

Solution- we had to set a parameter by using java script in order to set the color or each bar that was briefed by the client so that when the reports were being viewed; the right and bright colors were displayed

The client wanted to get the whole entry-wise report in one pdf file and generating all the data from the report to pdf was almost logically unfeasible at the beginning.

Solution- We suggested them to generate the pdf in chrome browser so that they can customize the width of the pdf and display all the data in one pdf.

5.3 System Design

5.3.1 Workflow Diagram:

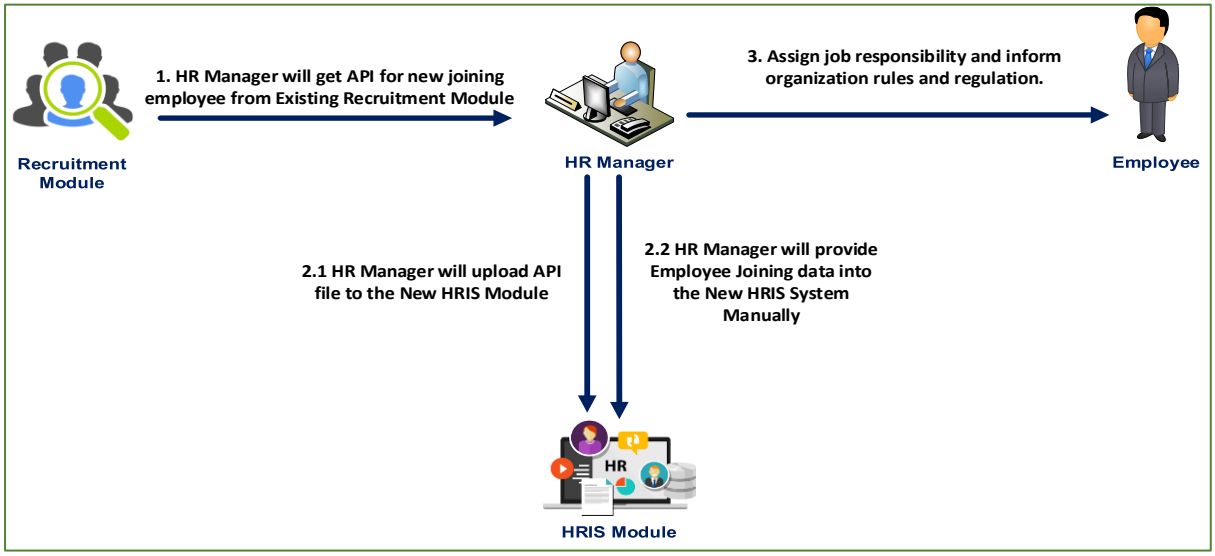


Figure1: Workflow Diagram of Employee Joining Process

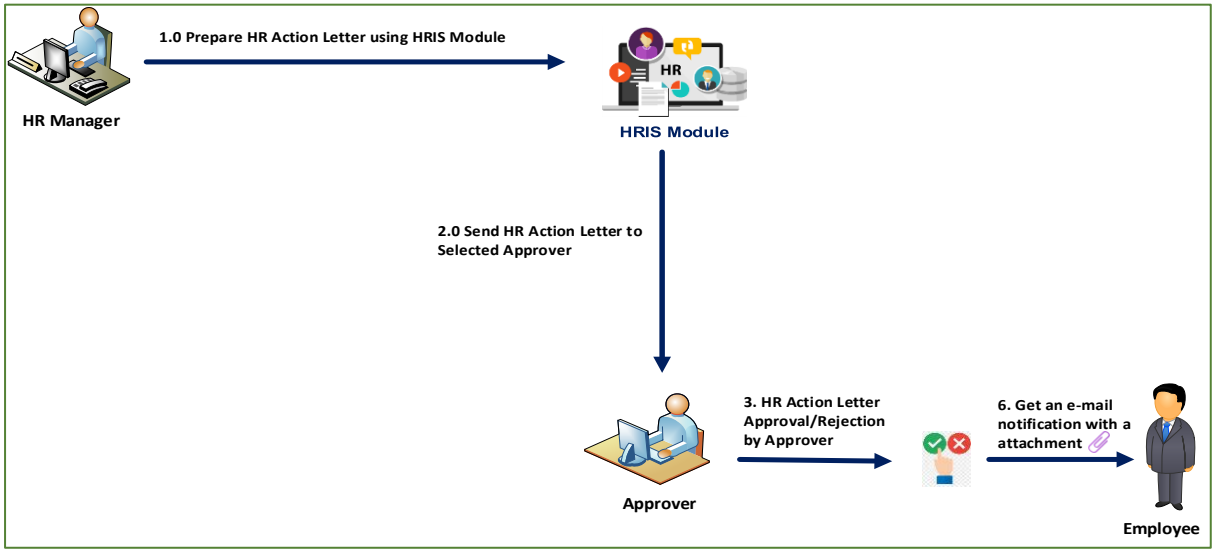


Figure 2: Workflow Diagram of HR Action Process

5.3.2 UML Diagram:

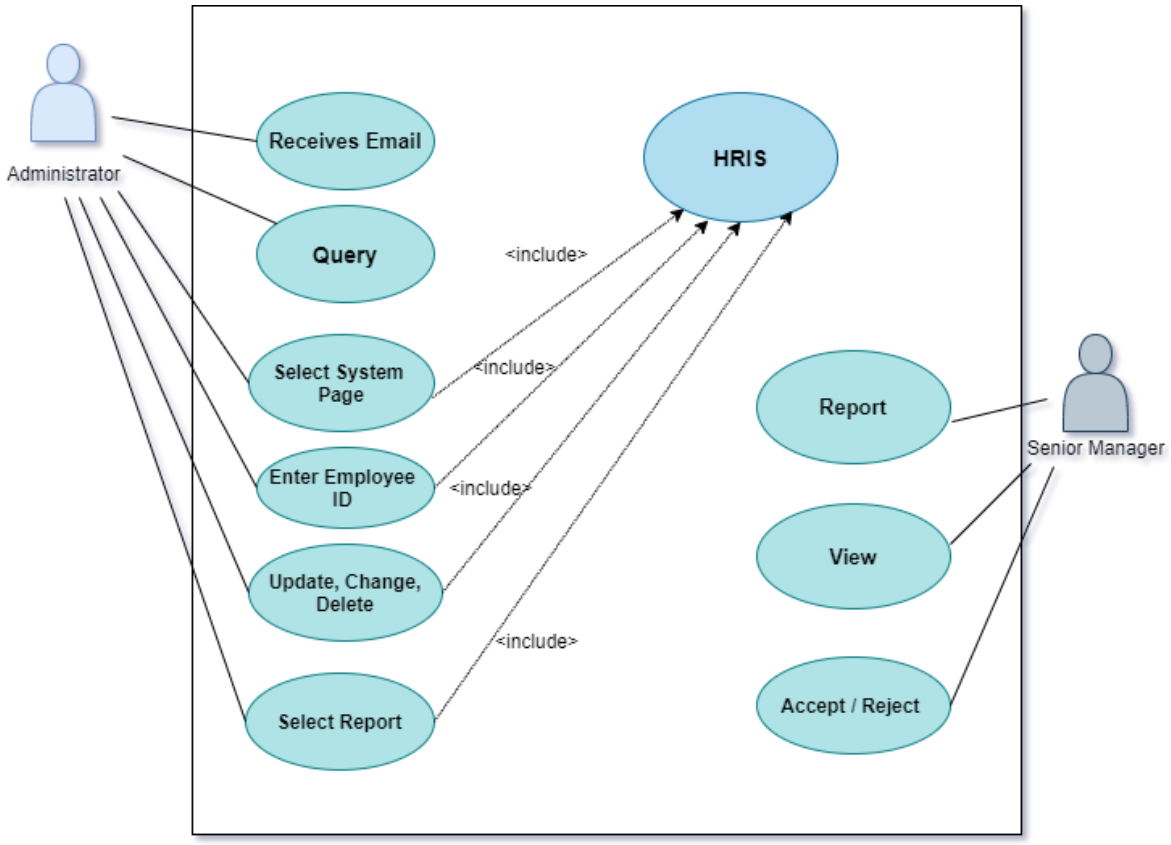


Figure : Use-Case Diagram

5.3.3 Functional and Non-Functional Requirements:

Functional Requirements

Function: Must be responsive across all types of screen sizes		
Input: N/A	**Process:** Application must be developed in a common development environment	**Output:** The application can be viewed by using any sort of devices
Precondition: User must have a device with an Internet Connection		
Postcondition: Everyone can use this application from any devices with different screen sizes		

Function: User must be able to log in		
Input: Username and password	**Process:** Call a login function	**Output:** User will be logged in
Precondition: User must be connected to the internet		
Postcondition: User will be redirected to the dashboard		

Table 5.4: Functional Requirement 2: Log in

Function: Search for a facilitator		
Input: Search for a specific facilitator	**Process:** Call data search function to the server to search for a specific facilitator	**Output:** Searched facilitator will be viewed
Precondition: Admin must be connected to the internet and be on the dashboard		
Postcondition: Admin will view their searched facilitator		

Table 5.6: Functional Requirement 4: Search function

Function: Search/View report		
Input: Search for the specific report (Progress/Trend/Entry-level)	**Process:** Call the report search function server to search for the report	**Output:** The searched report will be viewed
Precondition: User must be connected to the internet and be on the dashboard		
Postcondition: User will view their searched report		

Table 5.6: Functional Requirement 5: Search Report function

The following performance parameters have to meet.

SL.	Description	Specification
1	Volume of data	Up to 5 lakh records in 1 year
2	No. of concurrent users	15-20
3	Database query response time	3-5 seconds

1.Security

(A) User Level Security

i.Role Creation: User will able to create different role through the system like super admin and operator and so on.

ii.Role based default authentication:
Based on the role, system will provide to set the default option/access privileges of that role. For example: Operator is a role and the operator will get the option/access privileges to add data into the system through all or selected screens or pages except security part of the system.

iii.Default option/access privilege:
System will be able to show role based default option/access privileges. Suppose operator is a role and there may be multiple users under operator role. But each user under this role may not get similar privileges. For example: Mr. Lutfor Rahman is an operator and his privileges may be different to other operator's privileges. Under this scenario system will able to show default privileges of the operator and user (basically admin user) can discard some privileges or can a dd some additional privileges for that user.

iv.Role based user authentication:
Under this conditions system will provide two types of option/access privilege s and these two types are mentioned below:

- Menu or page based privileges
- Menu or page and functionalities based option/access privileges

v.Menu or page based option/access privileges:
System will provide menu or page/screen based security. This means that when a user gets the privileges of the menu/page, user can perform all functionalities (add, edit, delete, view) under that menu/page. For example: Mr. Lutfor Rahman is a user (say operator) of the system and employee information is a page of the system. Under this condition Mr. Lutfor Rahman will be able to perform add, edit, delete and view employee data.

vi.Menu or page and functionalities based option/access privilege:
System will provide menu or page/screen and functionality based security. This means that when a user gets the privileges of the menu or page/screen, user can perform selected functionalities (add, edit, delete, view) of that menu or page. System will provide to set menu and functionality based privileges according to user. For example: Mr. Lutfor Rahman is a user (say operator) of the system and employee information is a page of the system. Under this condition Mr. Lutfor Rahman will be able to add data into the system and as well as he can view employee data. But he cannot delete and edit data of employee page because he was given the privileges of add & view functionalities only for this page.

2.Password of the System

System will be more secured and password protected. So that unauthorized users cannot access into the system. For better access control of the system password will follow the following rules:

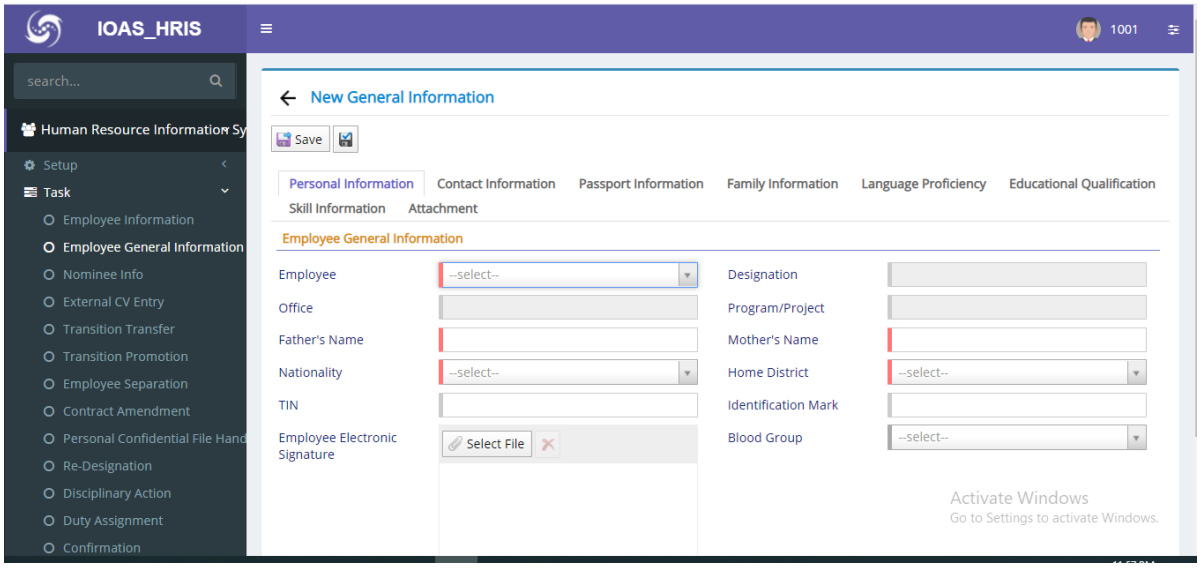
- Length of password will be minimum 8 characters and maximum 14 characters.
- Contains at least 3 of the 4 character types: Upper Case Letters, Lower Case Letters, Numbers, and Special Characters.
- Only encrypted passwords will be stored into the system.
- System will allow of changing one's password. So that anyone can change her/his password if she/he wants.
- System will not allow entering malicious text something like <script> which may help hacker to hack the system.
- Password field should not allow copy paste (This is an standard practice).

For message and other non-functional requirement please follow "GOPF_Non-functional standard guidelines.

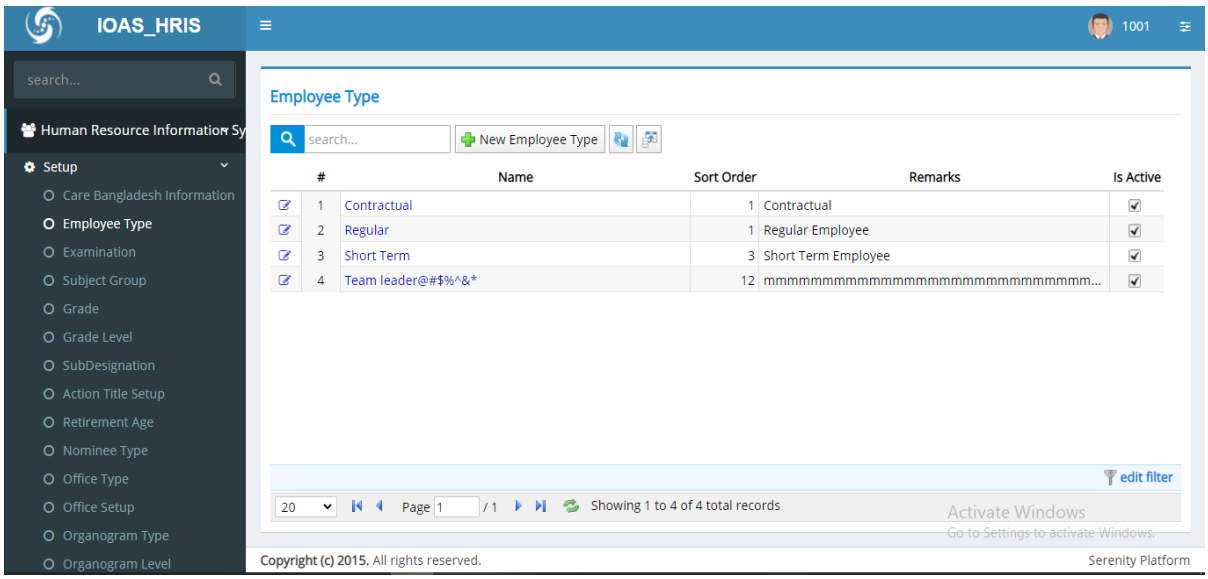
5.4 Product Features

5.4.1 Input

Employee General Information

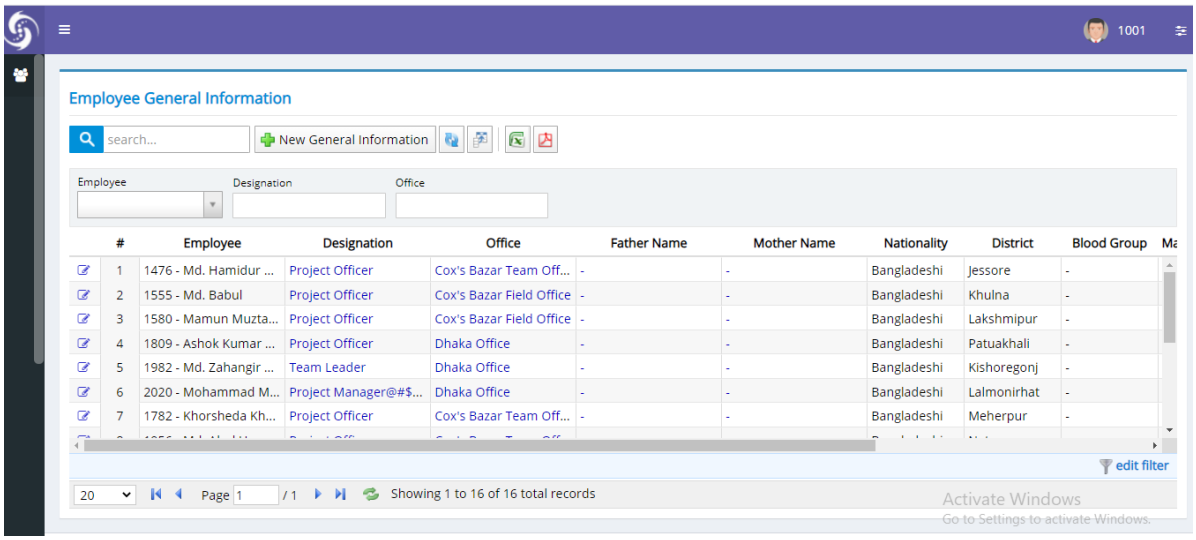


Employee Type

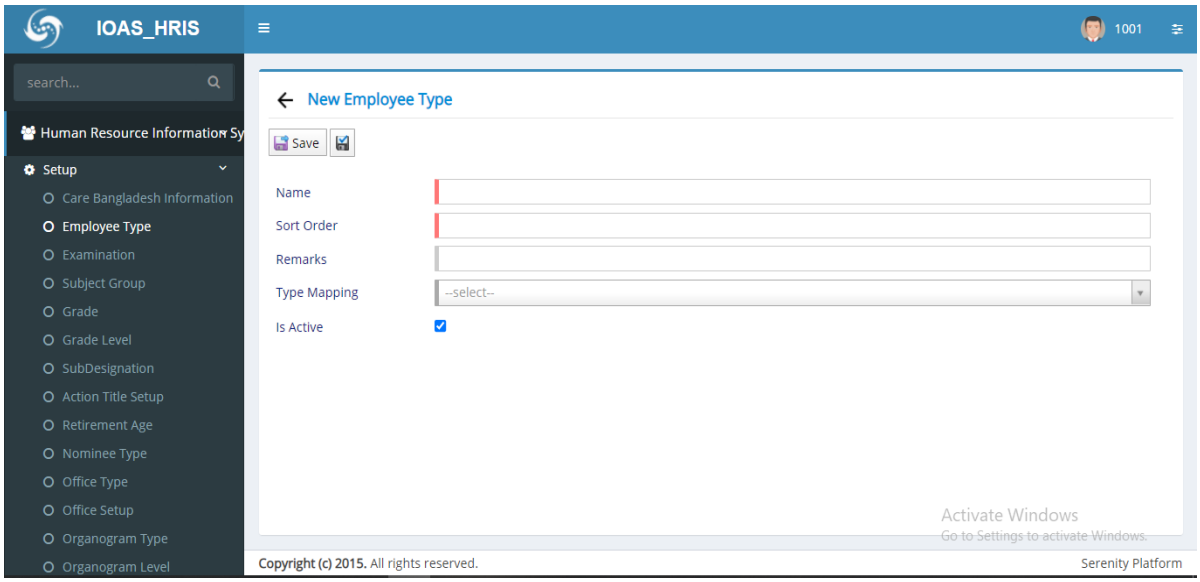


5.4.2 Output

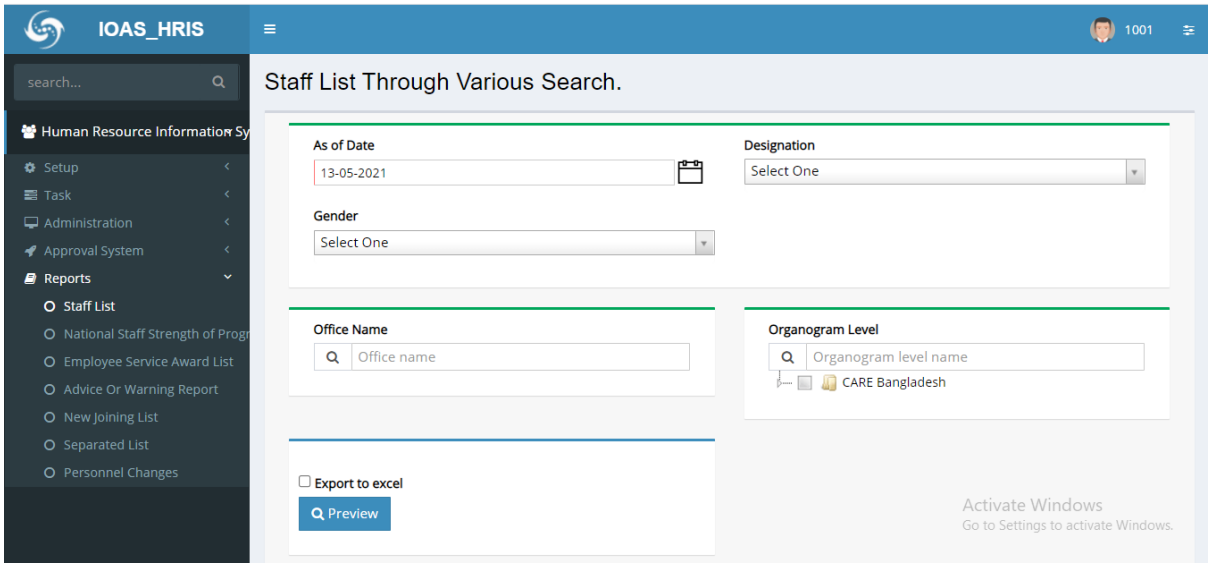
New Employee General Information Add Page



New Employee Type



Reports


IOAS_HRIS
1001
search...
Staff List Through Various Search.
Human Resource Information Sy
Setup
Task
Administration
Approval System
Reports
Staff List
National Staff Strength of Progr
Employee Service Award List
Advice Or Warning Report
New Joining List
Separated List
Personnel Changes
As of Date
13-05-2021
Designation
Select One
Gender
Select One
Office Name
Office name
Organogram Level
Organogram level name
CARE Bangladesh
Export to excel
Preview
Activate Windows
Go to Settings to activate Windows.

Chapter 6

Results & Analysis

6.1 MY PROJECT INVOLVEMENT

I work on a specific portion of a Integrated Online Application System (IOAS) .It's still an ongoing project. So there are some information that's I can't mention here. It's a office policy. But in here I mention some work with that I was involved.

6.2 OVERVIEW

When I joined TechnoVista IT they just started the Employee General & HR Info. of IOAS.
So, the development team was very active for developing the system. I was involved with this project my full internship period.

6.3 MEET MY TEAM

I was assigned to the Quality Assurance team. In this project I have been directly supervised by my team director Md. Abu Taher. He is an experienced Quality Assurance Manager and I have learned many things from him. From designing software architecture to using software tools effectively, he has taught me everything. I consider myself very lucky to get such a mentor and supervisor. As this is a huge project, most of my team members have been working on it.
Till now, 3 of my team members have been involved with it and I have assisted 4 of them.
They all are involved in this project as QA Tester.

6.4 TECHNOLOGIES

The technologies I have been working in this project are –

- JIRA Software
- Microsoft Excel File
- Php
- Laravel framework
- MSQL & Store Procedure

6.5 CHALLENGES

This project is the largest project of my life and may be larger than the combination all the projects I have done till now. I have learned many things while working on it and at the same time faced many challenges. The main challenge was to understand the concept and domain of the project. It was also a challenge to learn new technologies and apply them properly. I would again like to thank my supervisor for helping me to overcome these challenges by his guidance.

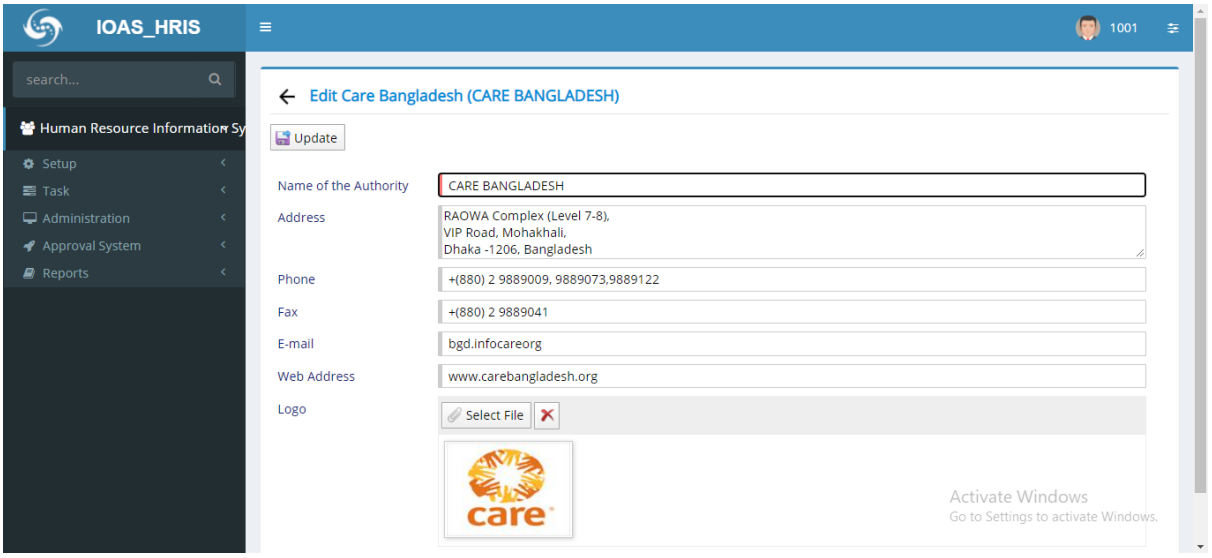
6.6 KEY MODULES OF MY PROJECT

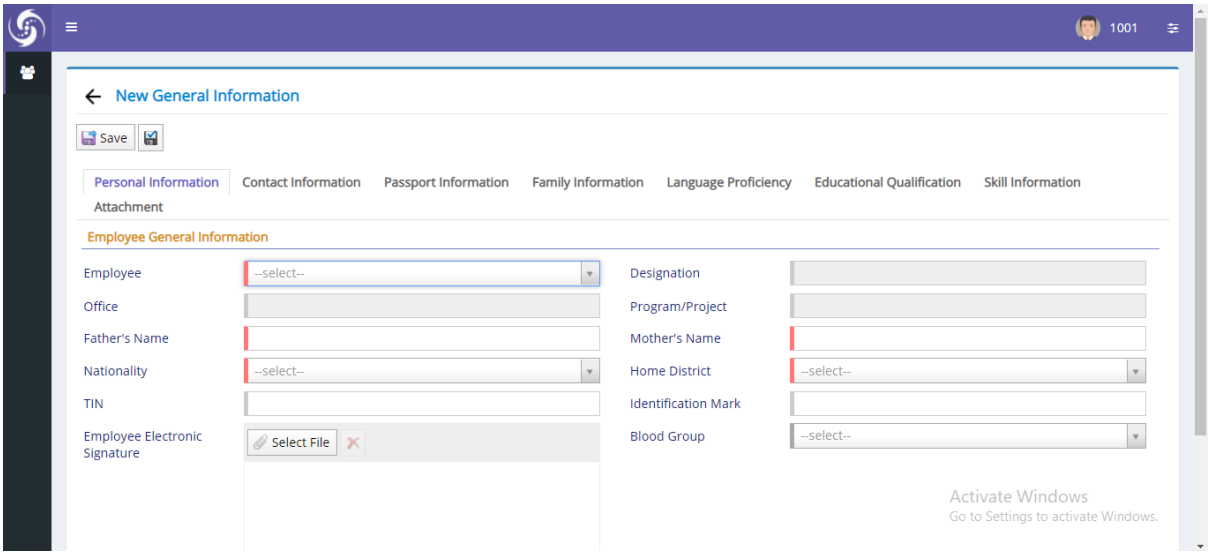
The Features you will get with this Module are listed below. You can ask for customization of any module if you think for your business.

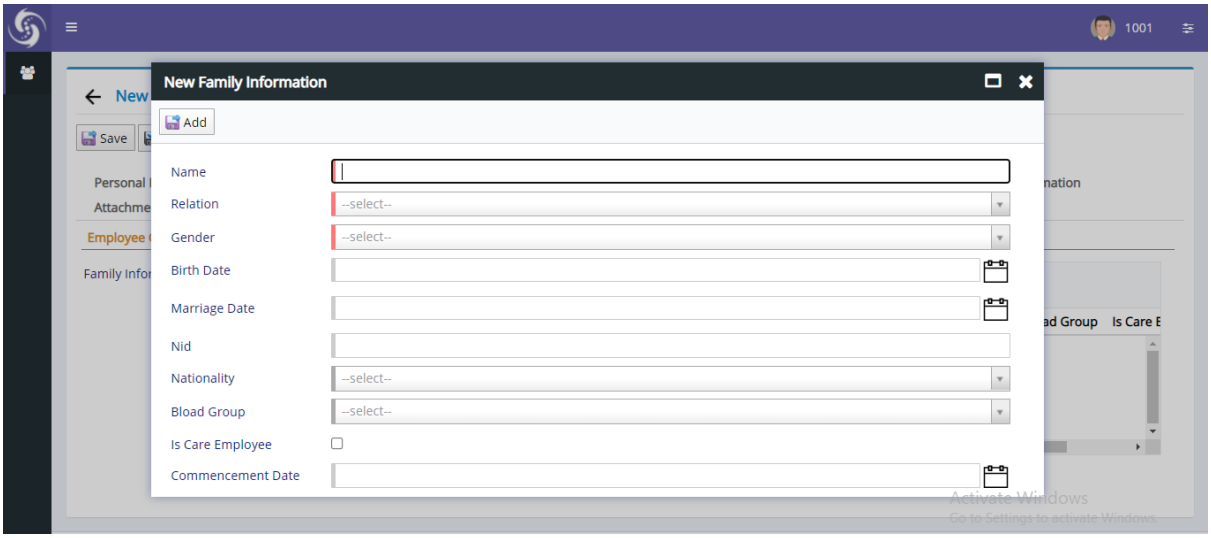
HRIS Module (Human Resource Information System)

- Setup
- Task
- Administration
- Approval
- Reports

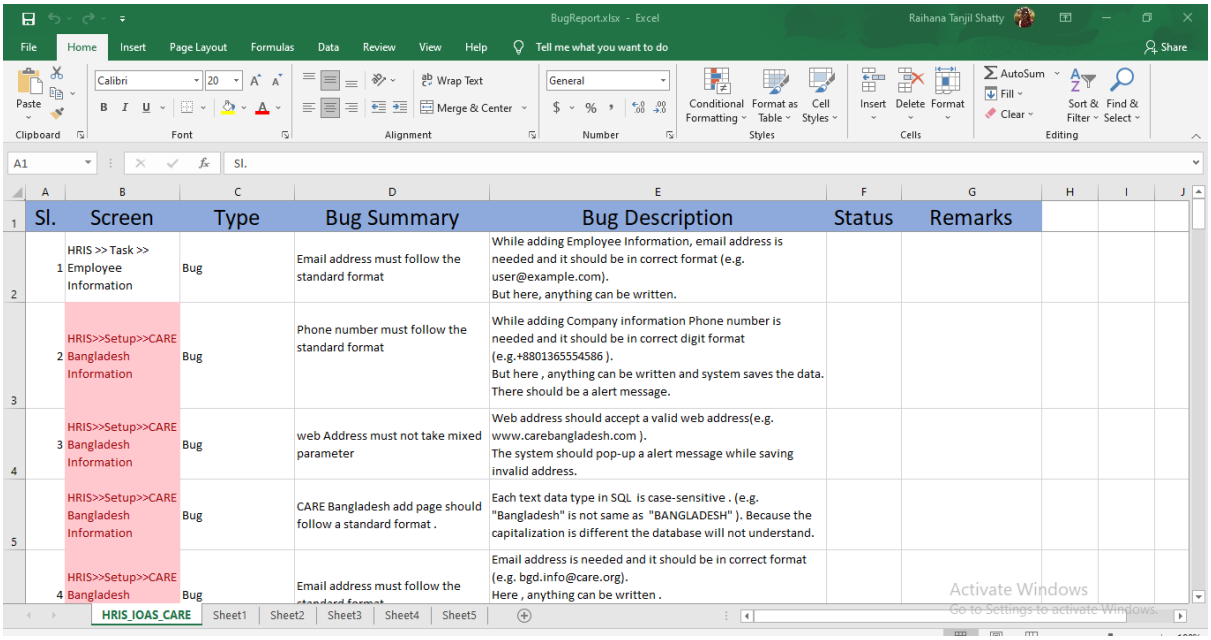
6.7 My Work Screenshot



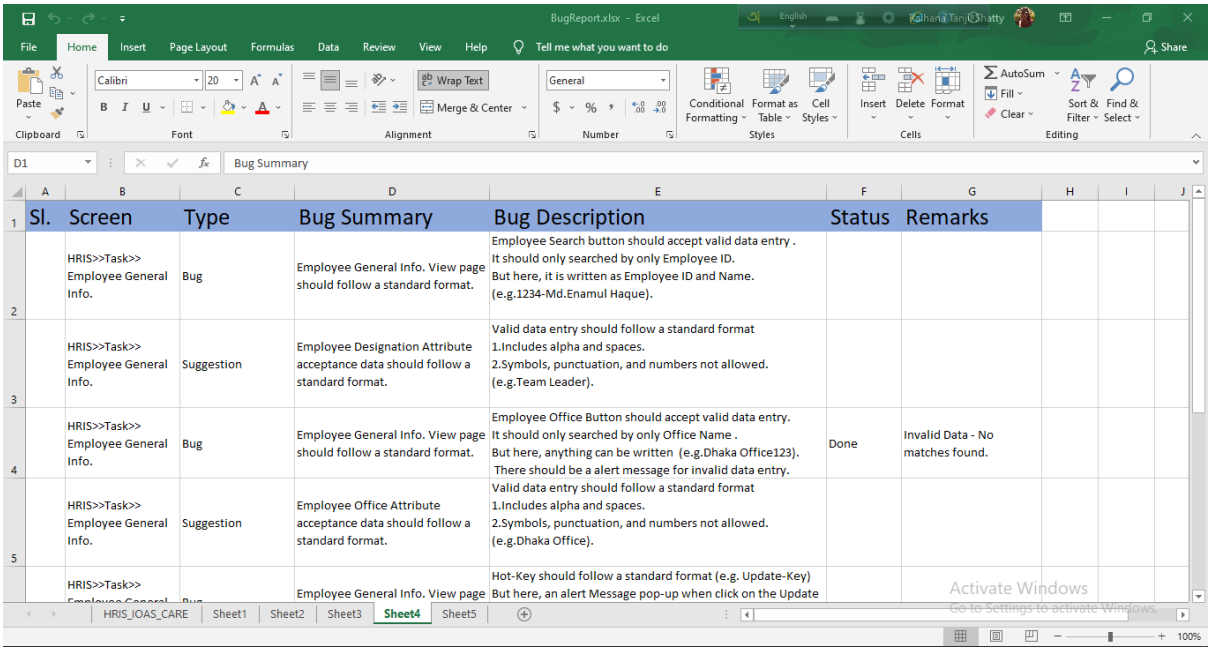




Bug Report



Sl.	Screen	Type	Bug Summary	Bug Description	Status	Remarks
1	HRIS >> Task >> Employee Information	Bug	Email address must follow the standard format	While adding Employee Information, email address is needed and it should be in correct format (e.g. user@example.com). But here, anything can be written.		
2	HRIS>>Setup>>CARE Bangladesh Information	Bug	Phone number must follow the standard format	While adding Company information Phone number is needed and it should be in correct digit format (e.g.+8801365554586). But here , anything can be written and system saves the data. There should be a alert message.		
3	HRIS>>Setup>>CARE Bangladesh Information	Bug	web Address must not take mixed parameter	Web address should accept a valid web address(e.g. www.carebangladesh.com). The system should pop-up a alert message while saving invalid address.		
4	HRIS>>Setup>>CARE Bangladesh Information	Bug	CARE Bangladesh add page should follow a standard format .	Each text data type in SQL is case-sensitive . (e.g. "Bangladesh" is not same as "BANGLADESH"). Because the capitalization is different the database will not understand.		
5	HRIS>>Setup>>CARE Bangladesh	Bug	Email address must follow the	Email address is needed and it should be in correct format (e.g. bgd.info@care.org). Here , anything can be written .		



Sl.	Screen	Type	Bug Summary	Bug Description	Status	Remarks
	HRIS>>Task>> Employee General Info.	Bug	Employee General Info. View page should follow a standard format.	Employee Search button should accept valid data entry . It should only searched by only Employee ID. But here, it is written as Employee ID and Name. (e.g.1234-Md.Enamul Haque).		
	HRIS>>Task>> Employee General Info.	Suggestion	Employee Designation Attribute acceptance data should follow a standard format.	Valid data entry should follow a standard format 1.Includes alpha and spaces. 2.Symbols, punctuation, and numbers not allowed. (e.g.Team Leader).		
	HRIS>>Task>> Employee General Info.	Bug	Employee General Info. View page should follow a standard format.	Employee Office Button should accept valid data entry. It should only searched by only Office Name . But here, anything can be written (e.g.Dhaka Office123). There should be a alert message for invalid data entry.	Done	Invalid Data - No matches found.
	HRIS>>Task>> Employee General Info.	Suggestion	Employee Office Attribute acceptance data should follow a standard format.	Valid data entry should follow a standard format 1.Includes alpha and spaces. 2.Symbols, punctuation, and numbers not allowed. (e.g.Dhaka Office).		
	HRIS>>Task>>		Employee General Info. View page	Hot-Key should follow a standard format (e.g. Update-Key) But here, an alert Message pop-up when click on the Update		

6.8 Analysis :

Testing Methodology:

In the testing phase, the following techniques are used:

- **Unit Testing:** In unit testing phase, the process of testing each program was tested separately in the system. The actual programming codes were carefully scrutinized in order to identify bugs if present.
- **System Testing:** In system testing phase, the entire process was run with dummy data. This was done to test the smooth operation of the database system.
- **Debugging:** Any errors or bugs, which were located in the testing phase, were immediately studied and identified the cause and then modified the coding.

There are few stages I need to oversee. Those are the key parts of the project.

Analyze Specification: In this part, I need to recognize the fundamental necessities, make a prerequisite diagram, and make an outline that demonstrates the procedures of the system and the system architecture.

Design Specification: when analyzing part was completed I have create system design structure that means system design pattern. First of all I identify the class and create a diagram that demonstrates all class and their relationship and dependencies to each other.

Test Plan and Strategy: Testing is the most imperative part of an application or system. There are several parts of testing but major two parts that I follow for this system.

Functional testing the test the functionality before system implementation and executing testing that tested after implementation.

Quality Planning: Quality Planning is the process for "identifying which quality standards are relevant to the project and determining how to satisfy them": Quality planning means planning how to fulfill process and product (deliverable) quality requirements. (Reincke, 2009)

Quality Assurance: Quality Assurance is an expansive practice utilized for guaranteeing the nature of items or administrations. On the off chance that the procedures met the necessity of stakeholders, it recognizes quality standard. There are many quality assurance tools available and most useful tools is audit.

Quality Control: Quality Control comprises of the perception methods and exercises used to satisfy necessities for quality. You can consider quality control as the exercises that are utilized to assess whether your item or administration meets the quality necessities indicated for your undertaking. Note that venture quality control is performed all through the task. Quality control works on:

1. Provide a basis for corrective action
2. Replay about the quality assurance process
3. Preventing error out of the process.

6.9 why Do Manual Testing

Manual Testing are those which requires the physical involvement of human beings. Automation Testing is must and needed and its rise its popularity suggests to some that manual testing is falling out of favor. So, this post will explain why manual testing is important.

1. Usability and UX Testing: Its important for a user to get friendly with the system dashboard. Usability/UX testing is the way testers discover if the System or any website behave as expected or not. For Example : Employee Info. & HR System online Dashboard color context, System Features, Graph Line, Module Spelling, Name.

2. There's a whole bunch of testing that simply can be done manually: User experience is probably the biggest reason why manual testing is important. We all could use valuable criticism from time to time (even developers!). When it comes not just to functionality but also to first impressions, there's no replacement for the human eye. only a human can double-check language use and other key localization factors in a product targeting multiple regions.

3.Bugs are found where we lease expect them: Like we make a dashboard with filling some attributes. For example Phone Number Attribute should only except digit number but sometimes developer don't take it serious or just ignore it. But when the user will use the system he/she might input some invalid data and system saves the data. From a taster perspective it's a bug.

4. Manual Tester learn more about the user perspective: Because human testers often act like a user, they provide a lot more value than just knowledge of how the product is currently performing. Testers can also help steer products in new directions with their deliveries of issues and suggestions.

5. Automation can't catch issues that humans are unaware of: Bugs are often found where we aren't looking. But beyond that, there are also whole use cases and large risks that we may not be immediately aware of. This natural ignorance can be mitigated with exploratory testing or with exploratory testing that results in the development of new scripts.

6. Good Testing is repeatable but also variable: The most successful testing has a mix of two factors: repetition and variation. Automated testing is great for the continual checking process, but it's just not enough. You also want variation, and some wild card use cases.

7.Manual Testers can quickly reproduce customer - caught errors: While you hope you catch all bugs before deploying, you also hope that your customers will kindly let you know of any errors. Hotfixes are a must for cloud-based products. A manual tester can use the information submitted by the customer to submit a bug report that will be helpful to the engineer.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

Sustainability relates to the capacity of the application to be maintained and modified. In the real world, every project or application being launched needs to be retained and constantly modified for its user base. Project importance, acceptability, political expediency, feasibility, and adaptability of the project can be assessed by sustainability analysis.
A project can be sustainable in three main categories:

Community Sustainability

There are many other forms of this kind of support, such as uploading and updating the program via the application.
After the deployment and official release of the application Employee Info. & HR System of IOAS, it's performance was highly praised by our clients at CARE Bangladesh as this application was of great help and had proven to be effective and efficient. As the user base grows so will the community and hence it can be said that it is Sustainable in terms of Community.

Financial Sustainability

This applies to how the operating expense of the project will be sustained after it has been launched and whether adequate income will be generated as an acceptable benefit. The operating expense of an application covers database costs, storage costs for the servers, etc.

Employee Info. & HR System of IOAS has helped to cut down their expenses of managing a full cloud hosting platform; rather the application had helped them both organize and efficiently compile all the reports and send them to their desired places with moderately low costs.

Organizational Sustainability

It refers to how, following the release of the submission, the company can continue to function. Typically, after the release of an application, the company retains the application by its original staff, an expanded team or a new team. Organizations also upgrade their project by adding additional elements to it, and organizations can pivot to other projects, grow teams, build new ones, and The team of web developers in TechnoVista that delivered Employee HR System has many more future planned features to be worked on and released. Since it is a unique application, the project will be maintained and updated after its release as per the requirement set by our clients at CARE Bangladesh.

7.2 Addressing Ethics and Ethical Issues

There are some unspoken principles and ethical standards that need to be followed when focusing on designing and launching an application in the world of smartphones with too much data gathering, theft, cybercrime, etc. The developers of Employee Info. & HR System claim that the application would not break any code of ethics for the production and production of the application because all of them have been deeply involved. Some of them are:

Collecting only relevant User data:

The online webpage server collect user data, but those are strictly and only relevant for the online data storage. The only data that is being collected are the information that was required by the survey and preferences information that the people will only provide on their own accord.

Not Sharing or Selling any User data:

Even though the data collected may not be of any privacy concern for most rural people, the app does not let any service, any application, or any third party have access to the data collected.

Data Storage Security:

Only the lead developers and the owner of CARE Bangladesh has access to the server and the database. Since they are hosted in the company database system and can only be accessed via lead developers and the owner's login credentials; the data stored can be deemed as safe and secure.

Clear Promotion:

Employee HR system of IOAS only intends to promote the company that created it,itself, and employee information. Other than what has been mentioned, Employee HR System has no intention of promoting anything or anybody else.

Chapter 8

Future Work & Conclusion

8.1 Future Works

The users go through a two-step process while entering or importing the data in Employee Info. & HR System database. In future the data can directly be imported to the database and the process will take less time.The data collection process will be easier and more accessible than before.This will in turn demand for a more enhanced database and the Employee Info. & HR System will be ready to deliver. Time tracking format can be introduced too so that which user imported the data when could be traced at all times. All these features can be added in the future by hiring more developers.

8.2 Conclusion

It was a wonderful experience working with the TechnoVista Ltd family as an intern. During the internship period I have learnt and applied a great deal. I was introduced to new cutting-edge technologies like JIRA, Node.js. I have learned a lot about the development of various forms of software and even about different styles of development. I have been forced to quickly respond to developments and come up with rational ideas. I worked with my advisors.

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