Software Requirements Specification

for

Work Distribution System

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1. Introduction

Purpose

The basis of the SRS is to define the functional and non-functional requirements of
Work Distribution system. This system can be used in business organisations helping to create and manage various projects. It will illustrate the purpose and complete declaration for the
development of system. It will also explain system constraints, interface and interactions with other external applications. This includes the product overview, purpose, project scope, references, definitions and abbreviations.

Document Conventions

WDS : Work Distribution System
SRS : System Requirements Specifications
Manager : Someone who creates projects in a particular branch of company
Employee : Someone developing the application in the Company
User : Someone who uses the application
Project/Task : The documentation of the clients requirements put up in the proper format which the entire company is going to work upon.

Intended Audience and Reading Suggestions

This document is intended for developers, management team, clients and testers. This SRS includes all the functional and non-functional requirements of the software. It also includes user requirements and requirements developer has to fulfil. Section-wise reading of the document will help in proceeding with the development of the software.

Product Scope

WDS is a workflow management software. It is a software in which the Manager or the Team Leader will create a project and assign Employees to the Project. Each Employee will be given with some work and due date related to it. The Employee will Update his daily work and get notifications about the due dates. This will help in maintaining a proper discipline in business environment.

References

These are the following references for the srs document:

R. Y. Wang, V. C. Storey and C. P. Firth, "A framework for analysis of data quality research," in IEEE Transactions on Knowledge and Data Engineering, vol. 7, no. 4, pp. 623-640, Aug 1995.

https://www.signavio.com/post/document-workflow-patterns/

Z. Haibei and Y. Xu, "The Architecture Design of a Distributed Workflow System," 2012 11th International Symposium on Distributed Computing and Applications to Business, Engineering & Science, Guilin, 2012, pp. 9-12.

C. Bussler, "Enterprise wide workflow management," in IEEE Concurrency, vol. 7, no. 3, pp. 32-43, Jul-Sep 1999.

2.   Overall Description

Product Perspective

In business environment it is very difficult to observe the development of particular project when there are multiple projects functioning. This software will help in maintaining the working of the projects and also maintaining profiles of employees. Some add on features added to this are notifications regarding due dates and statistics of the project etc.

- Cross platform support: Offers operating support for most of the known and commercial operating systems.
- User account: The system allows the user to create their accounts in the system and provide features of updating and viewing profiles.
- Number of users being supported by the system: Though the number is precisely not mentioned but the system is able to support a large number of online users at a time.
- Search: search is simply local search engine based on keywords.
- Discussion Forum: Provides users with a platform to discuss and help each other with their problems.

Product Functions

- Manager can create a Project and assign Employees and their work with respective due dates to it.
- Each Employee has to login and update the work completed daily.
- Status of the project can be checked by the manager as and when required.
- Employee can check number of leaves they have left with them.
- Also, Employee can check his/her salary updation status according to his leaves.

Work Distribution System
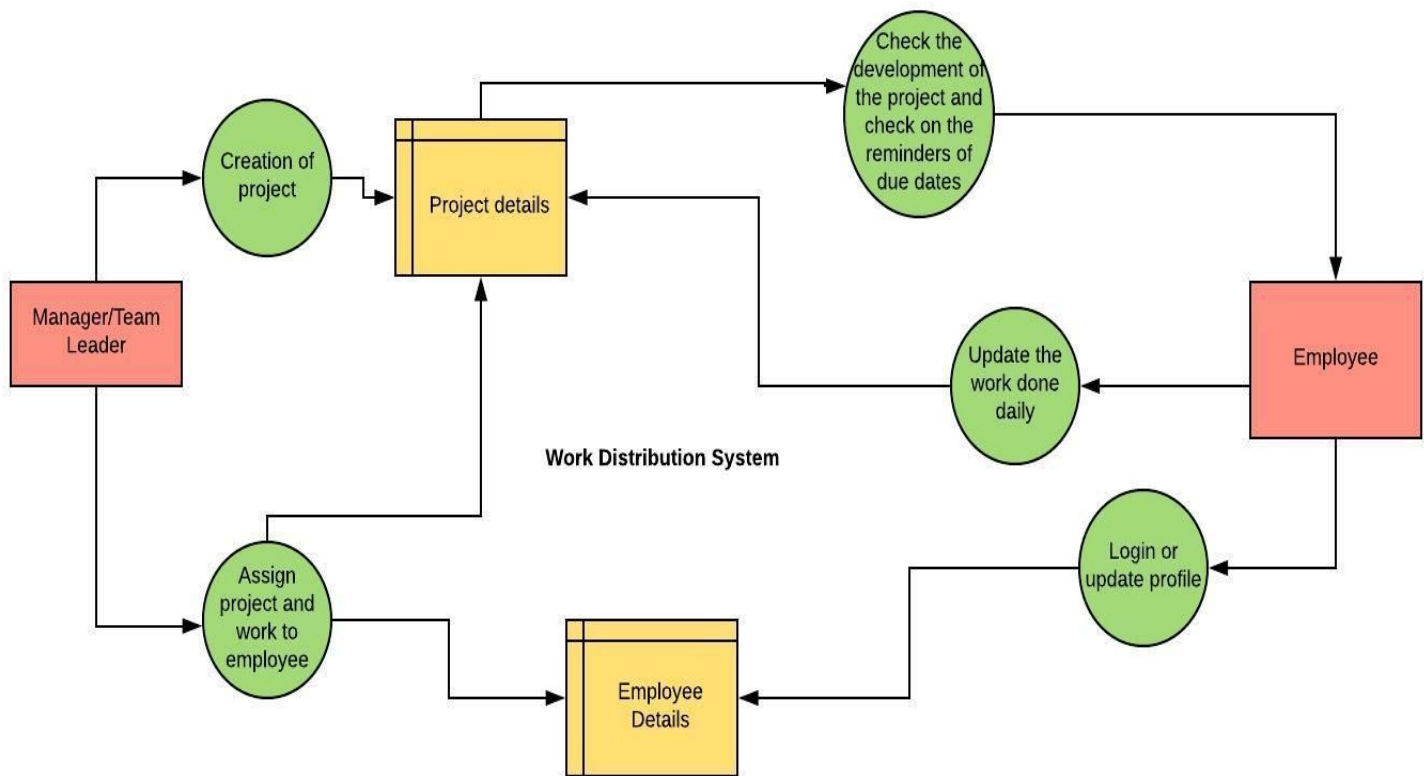
Above diagram shows how the data flows from one module to another and how they are related.

User Classes and Characteristics

There are mainly two user classes in this system namely:
- Manager/Team Leader : Manager will create a Project. He/She will assign Employee to the Project and give them respective work. Also, he/she will supervise the development of the Project.
- Employee : Assigned Employee will login everyday and work on his/her assigned project. He/She will regularly update the development of the Project. Also, he /she will check the notifications of the due dates of a particular work.

Here, as seen above, both the the user classes have equal importance in specific part of the work. Manager creates and supervises the project and Employee would actually work on it.

Operating Environment

This software is a web app which will work on desktop and laptop. To use this software one should have a good internet connection. Also mailing facility should be present in the hardware used to provide notifications.

Design and Implementation Constraints

Every user should be a member of the company and authenticated Manager or Employee.
The user should have the latest version of python installed in the system. The database should be large enough to occupy the data of the whole company. User should verify their emails with the software which will help with the notifications.

User Documentation

The software is very simple to understand and work with. A one day workshop will be sufficient for the workers to learn it and once they use it they will eventually get through it.The user manual gives user a clear idea about the authentication of user id is working is understood. The manual also provides with the necessary steps of registration. It also provides with all the prerequisites that the user should have , so that the user gets an idea of what he/she should learn beforehand. It contains all the required installation help steps of the software required.

Assumptions and Dependencies

Every user should be authenticated member of the company to access the details of the project. Without logging in user cannot access any information. Every user should have company verified email id and app related to it installed to get notifications. Every user should log in to get attendance for that particular day and also update the working of the project to get the statistics. Also user should have a bank account whose details are to be mentioned in their profile.

3. External Interface Requirements

User Interfaces

The software is basically a webapp. So HTML, CSS and JavaScript should be used to create web pages. Each web page should have interactive buttons to make it user friendly. Also each page will have a navigation bar which will have links to important web pages like Home, Help etc.
The UI should be easy to manipulate without additional training. The user should be able to interact with the system in any of the languages available in the language menu. The pages should use a GUI graphical environment, should be built with a good sense of color and contrast, and should be printable, using keys. All pages of the system should be accessible from any page.
There are two types of users - Manager and Employee.
- User Interface for Manager : Manager will have a login page at the beginning. After logging in they can view all the projects they have assigned. Each project will have a project page showing people assigned to the particular project and statistics of the project.
- User Interface for Employee : Employee will also have a login page at the beginning. After logging in they can view the works assigned to them and their due dates. They can also go to the project page and know the status of the project.

Hardware Interfaces

Data and control interactions will mostly take place through keyboard, mouse or touchpad. User will input the data through these resources and the data will get updated on the software. Before updating the data it will get authenticated. To work on this software one needs to have updated python version.Since neither the mobile application nor the web portal have any designated hardware, it does not have any direct hardware interfaces. The hardware connection to the database server is managed by the underlying operating system on the mobile phone and the web server.

Since the application must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for e.g. Modem, WAN – LAN, Ethernet Cross-Cable.

Software Interfaces

The database to be included in the software interfaces include mysql . The most comprehensive set of advanced features, management tools and technical support to achieve the highest levels of MySQL scalability, security, reliability, and uptime.

The operating system that is convenient and is required is Windows version , Ubuntu and Mac OS.
All of these updated versions help the system run without any interrupts .These are useful in managing the software and hardware interfaces. Provides a convenient environment for users to execute the system programs. Also allocate, fairly and efficiently, the computer resources needed to execute the system programs and codes safely. The communication between the database and the web portal consists of operation concerning both reading and modifying the data.

Communications Interfaces

The requirements associated with the communication functions in this case is email because to log on to the web page email verification is required at the time of registration and for the remainder part of the system where the user gets remainder if the due date of a particular project is close where we can adjust the time period of when there should be a remainder.

Web browsers are used to access this web application . Browsers such as Google Chrome , Firefox ,
Internet Explorer . These web browsers are used to retrieve the data from the web source and provide the user with information and allows user to view the retrieved information and navigate to access other information from the present site .

Communication standards such as HTTP will be used since its a web application .

Here data transfer rate depends on number of users trying to access or trying to make changes in particular part of the system . Synchronization Mechanism is maintained by using some of the scheduling algorithms so that retrieval of the data and update of work shouldn't be done and simultaneous update by users also have to

be taken care. Communication security or encryption issues will be related to user authentication and bank details verification for updation of the salary details for every month.

4.   System Features

4.1   Creation of Project

4.1.1 Description and Priority

The Project is being created by the manager/ team leader depending on the client requirements and also assigns due dates to the projects created depending on the client's requirements . After creation of the project , the manager/team leader divides the project to smaller modules based on the departments working on the project . The divided work is then assembled at the end to complete the project. This Feature is of High Priority because without the Creation of Project the employees cannot do any work and there will be no progress in the system because the database of the work will be empty to work upon without any input.

The Specific priority component ratings regarding benefit will be rated a 9 because all the user requirements will be listed out and will be made as a project. Regarding cost it will be rated as 6 because it is just the creation part of the project and there is just document part of all the requirements of the user and clients . Regarding risk it is a high risk of not to miss even a single requirement because the documentation and division of project again requires all of these steps to be performed repeatedly depending on how many times we have to change or append to the original requirements.

4.1.2   Stimulus/Response Sequences

- Stimulus: Manager will try to create a Project keeping in mind all the requirements of clients and users.
- Response : A documentation of all requirements.
- Stimulus: Manager will then request for upload of the Project details along with the due dates and client details to the system.
- Response: Allows the user to view the uploaded project details.
- Stimulus: Request for the documents related to the Project requirements and skills required to complete the project along with the due dates mentioned .
- Response: Display of the document to all the employees of the company.

4.1.3   Functional Requirements

The Project Manager/Team Leader will also log in through his account and then will note down all the requirements of clients / users and make it into a documentation and creates the Project with all the necessary details in it and also the dates of submission .

REQ-1: Allows the Manager to log in through his/her account using login id and password which authenticates the user presence and checks for the user/ client requirements.

REQ-2: Based on the Client requirements allows the Manager creates the Project with an appropriate title and all details of technical skills required for the project accomplishment.

REQ-3: The due dates are assigned the Project based on client requirement to release it in the market.

4.2   Assigning of Project

4.2.1   Description and Priority

The Project created by the Manager/Team Leader is divided based on the Departments which will be able to do the work or which match the technical skills required for that particular project work . The divided Project is being assigned to the employees based on the department they work under / Team leader they work under. This feature is of Medium Priority because even without dividing the Project the employees can work on the part of the project they are interested in but this doesn't organise things and can mess up the working parts of the Project because some parts of the project need outcome of some part of the project.

The Specific priority component ratings regarding benefit will be rated a 9 because the when the work will be divided it will be easier for employees to check which part of the work requires their skills and which part of the work has to be completed at the earliest. Regarding the Cost it is rated 5 because it requires to store all the employee lists in the company with branch and then work of the project assigned to he/she. Regarding the risk it is a high risk one because if the project is assigned to wrong department employee or wrong part of the work to the employee . This can mess up the project and also has huge time risk if the project won't be completed in correct time.

4.2.2   Stimulus/Response Sequences

● Stimulus:The Employee will login and updates for his/her department in which he/she is interested and has their technical skills.
● Response : If the user ID and password are proper user is allowed to update.
● Stimulus: The employee will check on the work assigned by the manager/team leader
● Response: The Employee can access the project work divided and assigned to him/her.
● Stimulus: The manager will assign the work to the employee based on his/her technical skills.
● Response: Work assigned immediately gets updated on user portal under view projects.

- Stimulus: While the employee can check the work assigned he/she will also have all required resources and can also check on the due dates mentioned for the particular work to be completed.
- Response: According to the due date reminder is generated on to the User account.

4.2.3   Functional Requirements

This feature basically divides the entire work stored in database to modules and hence the can be easily done in parts and then put together for the complete project . This work is based on the departments in which the employees are working such as coding , developing , testing etc. And the work is given priority based on when that part of work should be completed because some parts might require other part of work as input .

REQ-1: Allows User/Employee to login and then check the work assigned to a particular Employee.
REQ-2: Allows Manager to divide the project work and give the information to the departments so that it can assign work to employee.
REQ-3: The assigned work appears in the Employee portal and then user can access the work allocated.
REQ-4:   The manager checks how much part of the work is done by the Employee.

4.3 Updation of the Project

4.3.1   Description and Priority

The Employee will update the the status of the assigned task he/she is working on regularly. This will in turn update the overall working of the project. Using this updation statistics of the project is developed. This feature helps the Manager to keep an eye on the development of the Project. Also, Employee working on it can get to know about his co-workers and their work which will help in interdependent tasks. This should be given medium priority as once the Project is completed this portion of data doesn't matter much.
The Specific priority component ratings regarding benefit will be rated a 8 as it is important to keep a track of development of the project however after completion of the project this record hardly matters. Regarding cost it will be rated as 7 as this part includes documentation as well as notification provider. Considering risk, it will be rated 8 as even if some task updation is missed out the statistics of the project will change.

4.3.2   Stimulus/Response Sequences

- Stimulus: Employee will try to log in
- Response: Taking username and password employee will get logged in and assigned tasks are being displayed.
- Stimulus: Employee will try updating status of task assigned.
- Response: Task details will get updated in turn updating project statistics.

4.1.3   Functional Requirements

The user should log in the system. Then the assigned projects and assigned work list should be displayed. Selection of checklist should count as completion of the task. This data should update the statistics of the project. Also according to the due dates notifications through emails should be sent to the user.

REQ-1:   The user shall login to his/her account and see all the projects he/she is assigned to with their deadlines. If the user is not authenticated or does wrong login a pop-up will appear displaying message about wrong login.

REQ-2:   Every user should access the project page and also able to update the work completed regularly. If the due date of that particular work is passed that particular task will be highlighted.

REQ-3:   According to the updated task, the project page will also get updated. Statistics of the project will also change.

REQ-4:   According to the due dates of particular task assigned, Employee should get a reminder mail to the registered email id.

4.4 Attendance Calculation and Salary Updation

4.4.1   Description and Priority

According to daily login by the user number of leaves of the user should be calculated. Also, leaves remaining should be displayed. Taking this data into consideration, salary of the Employee should be calculated and sent to bank accounts. This should be given   least priority as it is altogether independent feature and would not affect other modules.

The Specific priority component ratings regarding benefit will be rated a 7 as it helps employee to keep track of his/her leaves and helps in salary calculation. However, it is not a task of much importance. Regarding cost it should be rated 7 as it has to get linked with Bank account getting bank details. Considering risk it shall be rated as 8 as

Bank details are to be dealt with and is at high risk.

4.4.2   Stimulus/Response Sequences

- Stimulus: Employee will try to login using valid username and password.
- Response: Employee will be logged in and attendance is updated.
- Stimulus: Check his/her number of leaves
- Response: Calculate number of leaves in that particular month.
- Stimulus: Employee wants to check number of leaves left
- Response: Calculate the number of leaves left.
- Response: Salary of the Employee is calculated and transferred into bank accounts.

4.4.3   Functional Requirements

Employee should initially login into the system. According to this his/her attendance is considered. Number of leaves should be calculated. Number of leaves left should be displayed. Salary according to the leaves should be calculated and transferred into bank account.

REQ-1:   The user shall be able to login to his/her account. If the user is not authenticated or does wrong login a pop-up will appear displaying message about wrong login. If the employee doesn't login, it will be considered as leave.

REQ-2:   According to this, the number of leaves should be calculated till date.

REQ-3:   Number of leaves left should be calculated. If there are no leaves left a highlighted message should be displayed.

REQ-4:   According to number of leaves, the salary of the Employee should be calculated. If number of leaves is very high then it should display a highlighted message.

REQ-5:   The calculated salary should be transferred into bank account registered by the Employee. Any discrepancy in bank details causing error should be notified to the Employee through a pop-up.

5.   Other Nonfunctional Requirements

Performance Requirements

Response time: It usually depends on number of projects present at that time and and number of people accessing the same information .
The time taken by user to access or to upload the work assigned should be less.

Workload: The system should support higher workload but most importantly it should also have an considerable speed of processing information. The system also be able to schedule the workload while processing or Handling such a large size Workload to be able to fulfill the needs of entire company. suppose the system is handling multiple projects signed different clients or may have similar due dates , In this entire source code regarding the project will be transferred from different departments to make into the entire project the workload has to be taken care in this case.

Scalability: The system should be able to make changes in how much workload it supports and it should be simultaneous i.e., whenever user is requesting for some particular project access or updating any information regarding the work done that day ,the expansion of

the workload capacity should be increased.

Platform Considerations: The Processor and resource requirements should be such that whenever
should be able to share with the other processes if needed.Suppose if
both Projects and Employee both need to share resources then it should
be allowed.

Safety Requirements

The use of product / software system might result in storage of heavy data / Project info which is not needed
and whatever work is being done in some particular day has to be uploaded that day
because there is always a fear of loss of data or some other data getting priority instead of the one
should be .

The safeguards or actions that must be taken are the size of the files trying to store on the system or
uploading of data changed or manipulated or being decisive of what data/work should be included and not
included . Actions that shouldn't be done are like without knowing the size of the files regarding the software
and downloading those files makes changes and again trying to push
those files back to system may cause some problems regarding space and speed of other processes working
on the system at same time and hence may cause synchronization problems .

External Policies or Regulations that state safety issues that affect the product's design are that the
environment the application is running should be taken care that it should be free from viruses . Updates
should be done in versions of the operating system regularly so that it may not cause any problem to the web
application .

Security Requirements

When security requirements are considered at all during the system life cycle, they tend to be general lists of
security features such as password protection, firewalls, virus detection tools, and the like.

Security requirements are that the User/Employee login id authentication because every user has different
position in the company and a different working space and technical knowledge and hence no user can
randomly enter into other user's account , and also every user has different projects allocated and different
pace of working . In the User Account might be some sensitive information regarding the bank details ,
salary details and hence cannot be open enough to everyone .Hence security has to be there to every account
that is being managed by the system and also every code /file /data that is being moved from one system to
other and also from user account to main branch of uploading work done every single day.

Realizing security early, especially in the requirement phase, is important so that security problems can be
tackled early enough before going further in the process and avoid rework. A more effective approach for
security requirement engineering is needed to provide a more systematic way for eliciting adequate security
requirements.

Software Quality Attributes

The product and be used in every possible working environment in order to have a organised and procedural working phase where it is easier to get to know your company employees having similar area of technical interests also and written or printed format is being reduced to very less percentage because it is all just automated and every user can access all the possible information regarding all the projects that the company is handling and his/her salary details and any other issues regarding them . It is adaptable to any environments supporting web browsers since the software is a web application. Correctness is the issue with security and safety of the data storage and changed with time .

 Maintainability of the system depends on how the application is understood , repaired and enhanced . The system has easy of use over ease of learning for someone who is experienced with already dashboards or a general study planning things because the application just has only these things at the frontboard which have utmost importance and hence the user doesn't need to have to be well prepared or already have an idea about all the processes or modules running .Supporting network and security connection always helps because the software has to get back to its original state after any problem without any changes not being saved. With any erroneous inputs it always a state where it can go back and check if such a step can be possible . If for any Project main requirement changes the System checks if such permissions are provided for employees to do .

Business Rules

Manager/Team Leader role here is to create a project and assign the work to employees and he/she is also a part of employee considering not to be in a really high position and then . He also advises the employee under his project regarding multiple choices to make . He/she also gives certain permissions to the employees regarding checking the requirements or changing them and possibly can also hire extra employees if needed . Can possibly decide the team he/she wants to work with for that particular project rather than giving a chance for employees to choose a particular project which they wish. Assigning of event management in the workspace . Can also shift by speaking to the clients.

Employee Role here is to take up the work assigned to him/her by the Team leader and can also propose any changes regarding the project or the approach to the problem specified and always requests for change of any of the possible methods/techniques/tools adopted to continue the work.

6.   Other Requirements

Database Requirements: A software engineering database management system , provides shared access to the program fragments, documents, tools, managerial Information, process description, and electronic messages that are generated In the course of a large-scale software development.

The criteria are derived from the requirements of software engineering rather than database technology. The criteria include support for
(1) consistent data in a concurrent environment;
(2) data integrity;
(3) basic and complex data types;
(4) data access by the end users;
(5) configuration management;
(6) tool development;
(7) documentation; and
(8) traceability for consistency and completeness checking.

Appendix A: Glossary

The terms necessary to properly interpret SRS are
WDS: Work Distribution System which is the main system/server which controls the entire software
Manager : Someone who creates projects in a particular branch of company
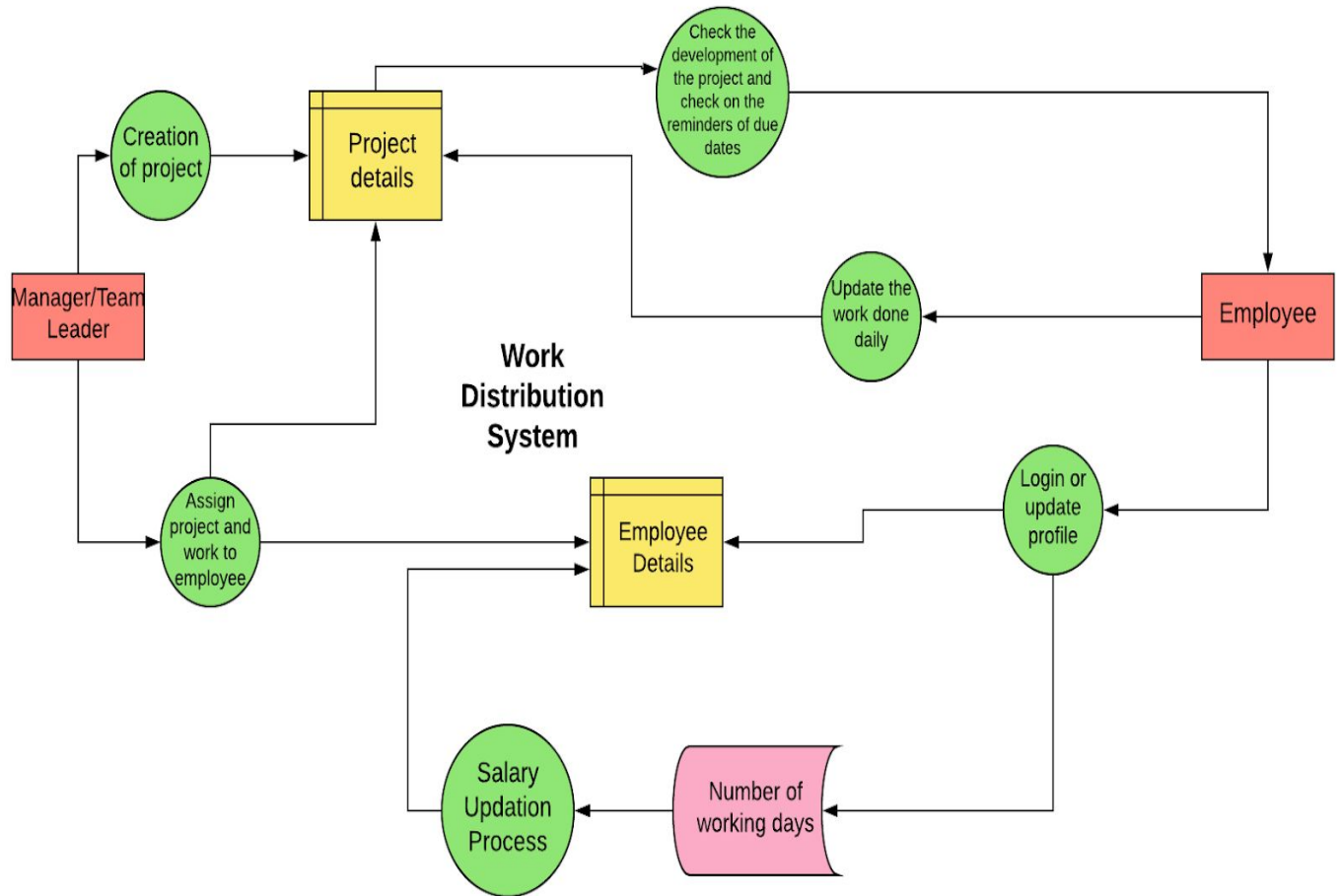Employee : Someone developing the application in the Company
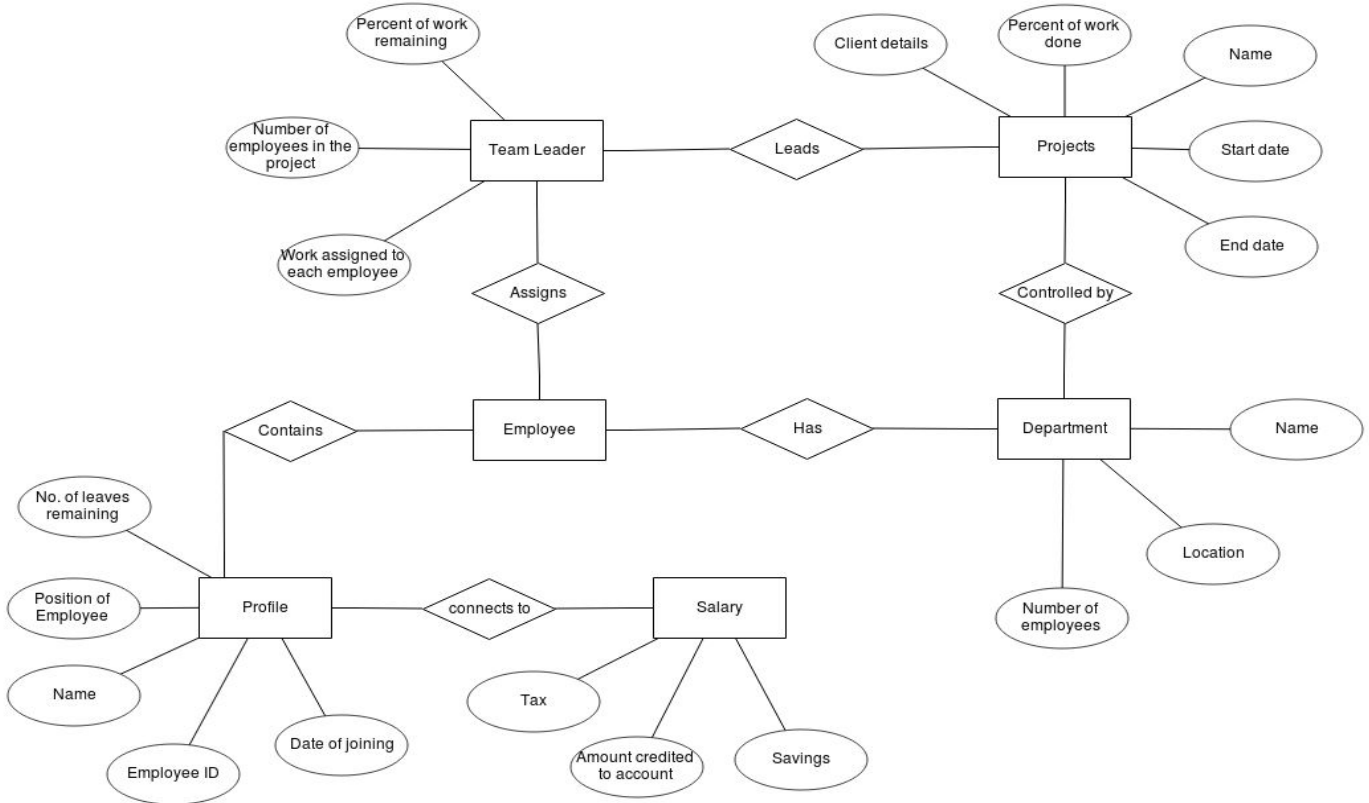User : Someone who uses the application
Project : The documentation of the clients requirements put up in the proper format which the entire company is going to work upon.

Appendix B: Analysis Models

DATA FLOW DIAGRAM:

ER-DIAGRAM:

Appendix C: To Be Determined List

No such specific requirements are there which are not mentioned in the document.