**Project Management Plan**

**For Dynamic Food Management**

**Group-11**

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# **I.** **OVERVIEW**

**Introduction:**

The following document represent Project management plan for the E-commerce website called “foodinfo.com”. Our start-up company is planning to promote food business online, with a team of 8 members who have relevant experience in developing ecommerce websites. E-commerce is been main area for developing the food industry. The website developed by the team will help in developing food enterprises through e-commerce and improve the supply chain of food.(##[**Research on e-commerce mode of food enterprises**](http://www.engineeringvillage.com.miman.bib.bth.se/search/doc/abstract.url?pageType=quickSearch&searchtype=Quick&SEARCHID=958fd802M3b05M426fM8d20M5afe2e4599bc&DOCINDEX=1&database=2&format=quickSearchAbstractFormat&dedupResultCount=&SEARCHID=958fd802M3b05M426fM8d20M5afe2e4599bc)##)

**Project Summary:**

The website developed will provide information about the perishable foods available in the market. Milk, meat and vegetables are considered as perishable foods. These goods will have certain amount of time period and thrown after the expiry. The main motivation of developing website is to provide information about perishable food availability in the market. We have chosen limited supermarkets namely Willys, ICA and LIDL, where every year huge amount of money is being spent on perishable goods. If the goods are not sold out, there is no other alternative from throwing away the product. In order to save money and food, our company is planning to develop a platform for both customers and retailers.

The information about the goods and their respective expiry dates are gathered by the company. Our website displays the product availability in supermarket where the customer can be benefited by the offers and purchases the goods according to their requirements and save money.

In this way the retailers are able to sell out most of the perishable goods and customers are benefited by the offer. Markets specified are restricted to Karlskrona. The company also does NGO services by collecting rest over goods and distributes to the orphanage and old age homes.

**Scope of project**

A. Project goals

· To improve food management through e-commerce.

· Saving food and resources.

· Service

B. Features

· Offers on perishable foods are displayed on the website.

· Location and quantity of the product.

· Availability of product in specified store.

· Reserve option for customer. (Cart and timer)

· Feedback channel.

· Search box.

· Offers to privilege customers.

· Donor and NGO services.

C. Function and task

The team has 8 resources, who has relevant experience in website development. The functions and task are divided according to their skill and knowledge in specified area.

Whole project planning is divided in to 3 sprints and each sprint has its own task which is distributed among resources.

D. DEADLINE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NOVEMBER 2015 | | | | | | |
| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|  |  |  |  |  |  | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 **STATUS REPORT** | 10 | 11 | 12 **SPRINT 1** | 13 | 14 | 15 |
| 16 **STATUS REPORT** | 17 **PROJECT PLAN** | 18 | 19 | 20 | 21 | 22 |
| 23 **STATUS REPORT** | 24 **REVIEW MEETING** | 25 **SPRINT 1** | 26 | 27 | 28 | 29 |
| 30 **STATUS REPORT** | DECEMBER 2015 | | | | | |
| **SPRINT 2** |
|  | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 **STATUS REPORT** | 8 | 9 | 10 | 11 **SPRINT 2** | 12 | 13 |
| 14 **STATUS REPORT** | 15 **REVIEW MEETING** | 16 | 17 | 18 | 19 | 20 |
| 21 **STATUS REPORT** | 22 **SPRINT 3** | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 |  |  |  |
| JANUARY 2016 | | | | | | |
|  |  |  |  | 1 | 2 | 3 |
| 4 **STATUS REPORT** | 5 | 6 **SPRINT 3** | 7 | 8 | 9 | 10 |
| 11 **STATUS REPORT** | 12 **REVIEW MEETING** | 13 **PROJECT PRESENTATION** | 14 | 15 | 16 | 17 **INDIVIDUAL REPORT** |

|  |  |
| --- | --- |
| **SPRINT START** |  |
| **SPRINT END** |  |
| **LONG WEEKEND** |  |
| **REVIEW MEETING** |  |
| **INDIVIDUAL REPORT** |  |
| **STATUS REPORT** |  |

**ASSUMPTIONS AND CONSTRAINTS**

1. Everyone in team has relevant knowledge in website development.
2. Five-day week.
3. Everyone participated in the project.
4. There will be change of requirements in the project.
5. Product new to the market.
6. Restricted to specific markets in Karlskrona.
7. Mutual cooperation between Stores and company.
8. There was no security breached, while accessing database.
9. Team members has required skill and technical support.
10. Team cohesion and trust is maintained throughout the project.
11. Website can be used by all type of users.
12. The company is NGO registered.
13. The company is led by two expertise.

**CONSTRAINTS**

1. Time

|  |  |
| --- | --- |
| Project Deadline | JAN 12th ‘16 |
| Time given for each resource | 170 hrs |
| No. of resources | 8 |
| Total human effort | 1360 hrs |

2. Budget

The company has no issues on budget, investor takes care of it.

3. Resources

The start-up company has only eight human resources and each member contributes 170 hrs human effort for project.

4. Open source code and free tools are used.

Company uses only open source tools in development process.

**II. PROCESS**

**Methodology**

The software can be developed through different methodologies. Selecting a suitable methodology is a key factor for success of project. The agile methodology is selected for this project. The reason behind selection of agile methodology is, there is a lot of flexibility for change in requirements, less time need to be allocated for documentation as main concentration is on working software, cross functional roles for the team members. (refrence) As our project is a start-up idea so the change in requirements are more, lack of standards in the company as the CMM level will be 1, so there need to be a design oriented development which consists of iterations. Also the skilled team members are there who can have group autonomy. The project is divided into sub-tasks where these implemented in iterations so a feedback can be collected from customer or stakeholders and improve in next iteration. Also technology or latest changes in industry can be easily incorporated in agile development. The selected framework for our project in agile is scrum. Scrum is selected because of following factors:

* As our project is a start-up idea there are no static requirements available. In order to handle the change in requirements scrum helps to review at the end of each sprint by conducting retrospective meeting.
* Quality is easily measured by using scrum methodology as there is continuous tracking is done by scrum master (paper).
* Deliverable expected dates can be easily met by comparing daily how much work done and how much work lag behind through daily scrum meeting (schedule).
* Scrum development methodology consists a review in each and every phase of the sprint (quality control). Usually the scrum meetings are conducted at regular intervals and discuss the project sprints, necessary changes when needed can be made, this help to review the scope whenever required and change the direction of the project in right way. Team members have the ability to distribute the task among themselves with respect to their capabilities.

The reasons for not selecting traditional method are fault requirements may lead to failure of project, less quality in the product as it takes more time, documentation requires more time, modification in requirements and scope change in this methodology is not flexible as our project is not static so there are frequent changes as start-up idea this methodology is not selected.

**Product Backlog:**

The product backlog consists of features/user stories to be developed in our project. They are as follows:

Store selection: In this feature, the user can select a store from given number of different stores.

Product selection: In this feature, the user can select a product from given different type of products.

Reserve product: The product can be reserved by the user so that it can received from the store.

Subscription: The user can subscribe to different products where the availability of products will be e-mailed to user.

Search option: the search option is feature to search any store, product, in the search bar.

Homepage: Homepage feature consists of all the menus and options.

Database connectivity: The database connectivity feature consists of user information, product updates, offer updates so it is also important feature.

NGO service: this feature is about the service provided by the organization through this website.

Login/signup: this feature consists of forms in which a user can login or create a new account in the webpage.

About us: This feature represents the main motive about the website so the new users can why this is established and purpose regarding the website.

Pay option: Pay option is for buying a product from the website.

Delivery option: delivery feature is about delivering the product which user bought so the delivery mode can cash on delivery, card payment.

Live chat: This feature is about the chatting the problems between customer support and user.

Customer service: Customer service feature is about the problems faced by users can be solved through talking or if any payment issues came these can be solved by customer service.

Feedback mechanism: Feedback mechanism is a feature in which feedback is collected from the users so that what changes need to be done to improve the Quality of the website can be known.

Availability of product: The availability of the product feature says about the how many products are available in a particular store.

Offers: this feature is about the offers in store are displayed in the homepage so that deals can be seen by users and select what they like.

Contact us: this feature gives the information regarding the address or email address of the website company.

Product quantity: The feature is to add the quantity in cart page to reserve or buy the product.

Social connectivity: The feature adds the connectivity with users by providing the social links to the user about websites.

Privacy policy: This feature is about the policy regarding privacy of the user so the data and personal information use can be known by the user whether it is safe to provide the data or not.

Donor button: Any donors who wish to contribute for NGO service can be done through this feature.

**Sprint Backlog**

The project is divided into three sprints. So the features are selected based on the customer value criteria. To prioritize the product backlog t-shirt sizing method is used, for every feature a certain value is given by the team such as S, M, L, XL. So features are selected to each sprints based on the prioritization. Customer value criteria is selected because the product is a start-up idea so we need to know how much a feature is valued by the customer as we are the customers in our project this method gets legitimate and riskless information. Each sprint lasts for two weeks i.e. 10 working days. So based on that, the sprint 1 consists of features that are necessary for other sprint features. The list of features in every sprint are given below.

|  |  |
| --- | --- |
| **Sprint** | **Features** |
| Sprint 1 | Homepage |
| About Us |
| Stores and offers |
| Database connection |
| Donor Button |
| Sprint 2 | Store selection |
| Product selection |
| Availability of product |
| Login/Signup/Profile |
| Reserve, cart, time countdown |
| Feedback |
| Database connection |
| Sprint 3 | Subscription(E-mail) |
| Quantity of product |
| Search bar |
| Social connectivity |
| Coupons, offers, Ads |
| Database connection |
| Privacy policy |

The other features which are not involved in above table are considered as future development due to limited effort.

**Roles and responsibilities of the members of the team:**

The given members for the project are eight and we have to utilize them for 170 hours each to complete the project. Among eight members we divided into product owner, scrum master and development team, where product owner and scrum master also acts as developers. (Self-organized teams) The roles and responsibilities are assigned based on the skills of each individual. As each individual have previous experience with web development so training is not provided among team members. The eight members are divided into four pairs for pair programming and work is assigned to them.

|  |  |  |
| --- | --- | --- |
| **Pair ID for coding** | **Resource ID** | **Names** |
| **P1** | **R1** | CHARLA, SHIVA BHAVANI REDDY |
| **R3** | MADALA, ANVITHA |
| **P2** | **R4** | MAGAPU, AKSHAY KUMAR |
| **R7** | VARANASI, PANCHAJANYA |
| **P3** | **R2** | CHILLA, KARTHEEK ARUN SAI RAM |
| **R6** | NEKKANTI, HARINI |
| **P4** | **R5** | MANDA, SAI NARAYANA SAMHITH |
| **R8** | YARLAGADDA, NIKHIL |

|  |  |  |
| --- | --- | --- |
| **Sprints** | **Phase** | **Roles of members** |
| Sprint 1 | Analysis | R5,R8 as analysts |
| Design | R2,R6 as designers |
| Development | R4,R7 as developers |
| Testing | R4,R7 as testers |
| Sprint 2 | Analysis | R5,R8 as analysts |
| Design | R2,R6 as designers |
| Development | R1,R2,R3,R6 as developers |
| Testing | R4,R7 as testers |
| Sprint 3 | Analysis | R5,R8 as analysts |
| Design | R2,R6 as designers |
| Development | R1,R3,R5,R8 as developers |
| Testing | R4,R7 as testers |

**Responsibilities of the team members**

As selected methodology is agile for development each member plays multiple roles in the project. So in our project six members are assigned as analysts, designers, developers and testers in three sprints and two members are scrum master and product owner who are also acts as developers.

1. Product owner: In our project the product owner responsibility is to have an interaction with customers (team members) to get the user stories and also to prioritize the product backlog, plans the release. The product owner plans the product based on situation of market, so that he/she can set goals to the sprint. The product owner in our team is R1.

2. Scrum master: Scrum master in our project acts as the communicator between product owner and the team members. Also facilitates the things needed by the team for development of the product. Scrum master monitors the progress of the sprint activity and also clears the obstacles for the team, conducts daily scrum. The scrum master in our team is R3.

3. Analysts: The analyst’s responsibility in our project is to gather the data from customers and stakeholder’s requirements. Mainly the requirements of stores as the product displays the offers of the stores. Then analysts made a list of requirement which can done as selected list, which cannot be done as not- selected list and requirement specification. These three have to be specified in a requirement document (RD) for traceability. The analysts in our team R5, R8.

4. Designers: The designer responsibility in our project is to design the database and interface for the web pages through using UML design tool Visio. The designers in our team are R2, R6.

5. Developers: The developer’s responsibility in our project is to develop webpages, style these webpages, create database and retrieve the data in webpages. So each member in the team acts as developers in our project where not all are experts, so pair programming concept is used to improve the quality of coding. The pair programmers are selected based on the similar skills so that one can code and other can review the code and also the ideas can be shared by both the coders.

6. Testers: The tester’s responsibility is to test the web application so that accessibility, usability, maintainability, portability levels in web application are tested to decrease the level of bugs and improve the quality of the application. The testers in our team are R4, R7.

**Effort Estimation**

***A list of requirements:*** In this the requirements needed to identify tasks and effort estimation are listed. The selected requirements are:

i. Stakeholders are the candidates who provides requirements for product development. All requirements are not developed because some may consist redundant requirements so a care should be taken to prioritize the requirements and satisfy the stakeholders.

* ***Stakeholder identification****:* identifying stakeholder is the main requirement as there are many stakeholders involved in the project. So the stakeholders are categorized in two ways: Internal and External. The stakeholders identified for our project are as follows:

Internal Stakeholders:

* Project team: The team members are the important stakeholders in our project. These members coordinate and develop the software product. The team needs are safety to their job, salary, and recognition of work.
* Sponsor: Sponsor is the investor of our project so main stakeholder is sponsor. Sponsor needs are to get a product with a value of the invested money.
* Stores: Stores are one of the stakeholder in our project, as there are three stores involved their needs are to sell their products within time.

External Stakeholders:

* Customers: Customer are the external stakeholders who visit the website so their needs are to get the information regarding products offers and discounts easily.
* NGO’s: This service is provided by our website so the needs of donors is to know that their money is spent in a good way for charities.

**Functional Requirements:** These requirements define the functionality of the system and the function consists of the what are needed inputs and what outputs are desired.

The functional requirements in our project are:

* View stores: This feature is about selecting a store and location of that particular from the different stores available.
* View products and offers: This feature is about providing the offers and selecting different categories of products.
* Access to user profile: This feature is to create a user profile and access it through respective usernames.
* Access to change personal data and email in user profile: This feature is to add, edit, or modify the user profile.
* Incorrect or successful login: This feature is regarding usernames length, incorrect usernames and characters required for password.
* Reserve the products: This feature is about the reserving the selected products.
* Wish list for users: This feature is about having a wish list for user in their profile so that they can easily select the feature.
* Access to edit, add, delete wish list: This feature is to add, edit or modify the wish list.
* NGO service: This feature is about providing NGO service and having donor option.
* Update about offers: This feature is about displaying the daily updates in the offers.

**Non-Functional Requirements**

The non-functional requirements in our project are:

**Work Breakdown Structure**

Work breakdown structure is used to breakdown the tasks into sub-tasks so that a hierarchy structure forms to get a simple idea about the overall project process. The work breakdown structure is presented in figure ##x.##

As the work breakdown structure is in a graphical representation, to understand more clearly a WBS dictionary is provided in table ##x.

Table X. WBS dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **WBS Code** | **Task** | **Task Description** |
| **0** | 0 | Food services project |  |
| **1** | 1 | Initial Planning |  |
| **2** | 1.1 | Team and topic |  |
| **3** | 1.1.1 | Team Introduction | Members in the team introduce themselves to each other |
| **3** | 1.1.2 | Topic ideas discussion | Ideas regarding the topic for project are shared and discussed |
| **2** | 1.2 | Topic and methodology selection | One topic is selected from all the available ideas based on the pros and cons |
| **3** | 1.2.1 | Brainstorming different methodologies | Different methodologies that are used in the present industry are identified and discussed |
| **3** | 1.2.2 | Agile selected based on team discussion | Individual perspective regarding the methodologies are provided. Methodology is finalized when all the team members came to consensus |
| **2** | 1.3 | Product backlog | Gathering required features from the stakeholders |
| **3** | 1.3.1 | Features identified | The required and useful functions that are helpful to the user |
| **3** | 1.3.2 | Estimation techniques | Techniques identified to estimate effort |
| **3** | 1.3.3 | Prioritization | Features are prioritized based on the customer value |
| **2** | 1.4 | Sprint planning |  |
| **3** | 1.4.1 | Sprint division | Sprints are divided based on time and features |
| **3** | 1.4.2 | Roles and responsibilities based on skills | Distributing the work based on the skills acquired by the team members |
| **3** | 1.4.3 | Sprint goal | To achieve the completeness of the tasks that are performed in that sprint |
| **3** | 1.4.4 | Sprint backlog | Features are divided for each sprint |
| **3** | 1.4.5 | Project plan | Documentation of project plan |
| **1** | 2 | Sprint1 |  |
| **2** | 2.1 | Analysis | Gathering the necessary requirements to accomplish the sprint |
| **3** | 2.1.1 | Gather data about tools | Information regarding the open source tools are gathered which are suitable to the project |
| **3** | 2.1.2 | Gather data for aboutus section | Information regarding the organization goals and the members of the organization |
| **3** | 2.1.3 | Regarding product details and offers from stores | Data collected for offers on the products |
| **2** | 2.2 | Design | designing the architecture or the blueprint of the requirements |
| **3** | 2.2.1 | Database design | Designing of database models |
| **3** | 2.2.2 | Interface design | Designing of user interfaces |
| **2** | 2.3 | Development | Implementing the activities using the resources |
| **3** | 2.3.1 | homepage | Implementing the features required for the home page |
| **3** | 2.3.2 | Aboutus page | Development of aboutus page |
| **3** | 2.3.3 | Stores and offers | Development of stores and offers page |
| **3** | 2.3.4 | Database modelling | Structuring the gathered information in database |
| **3** | 2.3.5 | Donor button | Developing the donor button |
| **2** | 2.4 | Testing | Test planning and test execution |
| **3** | 2.4.1 | Unit testing |
| **3** | 2.4.2 | Functional testing |
| **3** | 2.4.3 | Regression testing |
| **3** | 2.4.4 | System testing |
| **1** | 3 | Sprint2 |  |
| **2** | 3.1 | Analysis |  |
| **3** | 3.1.1 | Gather data about products and stores | Information gathering about products and stores |
| **3** | 3.1.2 | Gather data regarding product availability | Information about the availability of product |
| **3** | 3.1.3 | Details about login/signup | Characteristics are analyzed for user name and password |
| **3** | 3.1.4 | Data regarding features involved in signup | Information required to sign up for a new user |
| **3** | 3.1.5 | Data for feedback option | Information regarding the options to be included in the feedback |
| **2** | 3.2 | Design | Designing the architecture or the blueprint of the requirements |
| **3** | 3.2.1 | Database design | Designing of database models |
| **3** | 3.2.2 | Interface design | Designing of user interfaces |
| **2** | 3.3 | Development | Implementing the activities using the resources |
| **3** | 3.3.1 | Store page | Page development about the stores and their locations |
| **3** | 3.3.2 | Product page | Page development regarding the products types in each store |
| **3** | 3.3.3 | Product availability page | Page development regarding the availability of products in each store |
| **3** | 3.3.4 | Login and signup form development | Development of forms |
| **3** | 3.3.5 | Cart, reserve and feedback development | Developing the functionalities of cart |
| **3** | 3.3.6 | Database modelling | Structuring the gathered information in database |
| **2** | 3.4 | Testing | Test planning and test execution |
| **3** | 3.4.1 | Unit testing |
| **3** | 3.4.2 | Functional testing |
| **3** | 3.4.3 | Regression testing |
| **3** | 3.4.4 | System testing |
| **1** | 4 | Sprint3 |  |
| **2** | 4.1 | Analysis |  |
| **3** | 4.1.1 | Gather data regarding search criteria | Information is analyzed regarding the functionalities to be involved in search criteria |
| **3** | 4.1.2 | Gather data for social connectivity | Information is gathered regarding the social connectivity options |
| **3** | 4.1.3 | Gather information for coupons and offers | Information regarding when coupons need to be added and offers need to be provided |
| **3** | 4.1.4 | Gather data regarding store timings | Information regarding the timings of store and reserve function capability |
| **2** | 4.2 | Design | Designing the architecture or the blueprint of the requirements |
| **3** | 4.2.1 | Database design | Designing of database models |
| **3** | 4.2.2 | Interface design | Designing of user interfaces |
| **2** | 4.3 | Development | Implementing the activities using the resources |
| **3** | 4.3.1 | Subscription(e-mail) | Implementing the subscription option in profile page of users |
| **3** | 4.3.2 | Search bar | Implementing the search criteria for webpage with filters |
| **3** | 4.3.3 | Quantity of product | Implementing the addition of product quantity to wish list or reserve option |
| **3** | 4.3.4 | Social buttons | Implementing the social buttons and linkage to the external links |
| **3** | 4.3.5 | Privacy policy | Implementing the privacy policy of the website |
| **3** | 4.3.6 | Database modelling | Implementing the activities using the resources |
| **2** | 4.4 | Testing | Test planning and test execution |
| **3** | 4.4.1 | Unit testing |
| **3** | 4.4.2 | Functional testing |
| **3** | 4.4.3 | Regression testing |
| **3** | 4.4.4 | Quality assurance testing |
| **3** | 4.4.5 | Acceptance testing |
| **3** | 4.4.6 | System testing |
| **1** | 5 | Project Release |  |
| **2** | 5.1 | Deliverables | Final product is released into the market |
| **2** | 5.2 | Customer Feedback | Continuous feedback is gathered |
| **2** | 5.3 | Maintenance | Maintenance phase for the developed product starts |

**Effort Estimation**

The effort for this project is estimated by using COCOMO-II model. Other models are not considered because the present project is a start-up idea so no previous data regarding this project is available, for this reason human-expert based models are not considered as these models requires some previous experience to predict the estimates.

So our team consists of two experienced web developers (AS11) who can estimate the source lines of code(SLOC) for a webpage, so based on them we collected the SLOC data for each feature and make an average SLOC as two are experts so we used average of their estimates and these presented in table – ##x.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.No** | **Features** | **Expert 1** | **Expert 2** | **SLOC (average)** |
| **Sprint 1** | | | | |
| **1** | Home Page | 330 | 270 | 300 |
| **2** | About us / Information | 140 | 160 | 150 |
| **3** | Displaying the store and offers | 170 | 130 | 150 |
| **4** | Database management | 240 | 260 | 250 |
| **5** | Donor Button and NGO services | 100 | 100 | 100 |
| **Sprint 2** | | | | |
| **6** | Store selection | 100 | 140 | 120 |
| **7** | Product selection | 100 | 140 | 120 |
| **8** | Availability duration of the product | 60 | 60 | 60 |
| **9** | Login/ Sign up/ profile page, wish list | 350 | 250 | 300 |
| **10** | Feedback channel | 100 | 80 | 90 |
| **11** | Reserve button, Cart page and timer | 200 | 300 | 250 |
| **12** | Database Management | 300 | 400 | 350 |
| **Sprint 3** | | | | |
| **13** | Subscription | 190 | 150 | 170 |
| **14** | Privacy Policy | 110 | 90 | 100 |
| **15** | Social media | 90 | 90 | 90 |
| **16** | Search Box | 180 | 220 | 200 |
| **17** | Coupons/ offers / Reserve button enabling/ disabling | 140 | 160 | 150 |
| **18** | Database Management | 370 | 330 | 350 |
| **19** | Displaying the Quantity of the product | 60 | 60 | 60 |
| **Total** | | 3,330 | 3,390 | **3,360** |

The COCOMO-II consists of scale drivers and cost drivers in which we have taken all five attributes of scale drivers and some attributes of cost drivers which are suitable for our project are selected. The effort is estimated based on these values, clear representation of these values and calculation of effort is given below,

Effort = a x (KLOC) sf x Π ΕΜ I ---------- EQ (1)

sf is scale factors which is, sf = b + 0.01 x (sum of estimated scale drivers value)

there are two constant values which are, a is 2.94, b is 0.91.

The scale driver’s parameters are given in below table ## x.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Scale drivers/ Scale factors | Very Low | Low | Nominal | High | Very High | Extra High | Our estimated value |
| PREC | 6.2 | 4.96 | 3.72 | 2.48 | 1.24 | 0 | 6.2 |
| FLEX | 5.07 | 4.05 | 3.04 | 2.03 | 1.01 | 0 | 1.01 |
| RESL | 7.07 | 5.62 | 4.24 | 2.83 | 1.41 | 0 | 2.83 |
| TEAM | 5.48 | 4.38 | 3.29 | 2.19 | 1.1 | 0 | 1.1 |
| PMAT | 7.8 | 6.24 | 4.68 | 3.12 | 1.56 | 0 | 6.24 |

There are total five number of scale drivers as shown in above table.

1. Precedentedness (PREC):

It describes about any previous precedent for the developing product, as our project is a start-up idea there are no previous websites(AS5) available for food management. So the level of precedentedness for our project is very low (6.2).

2. Development Flexibility(FLEX):

It describes about the flexibility for modifying the product while developing. In our project the selected methodology is agile and change in requirements is suitable in this methodology and the conformity between team members is good, so the level of development flexibility is very high (1.01).

3. Architecture / Risk Resolution(RESL):

It describes about handling the risks and uncertainties in the project. As there are skilled people in the team and also two experienced members, the risks and uncertainties can be handled at a certain level so the level of architecture and risk resolution is high (2.83).

4. Team Cohesion(TEAM):

It describes about the cohesion and trust between the team members. As there are no language and cultural barriers, team members can easily understand other opinions and highly cooperative. So level of team cohesion in our project is very high (1.1).

5. Process Maturity(PMAT):

It describes the maturity level of team members and organization in the process of development. As this is a start-up project the level of standards in development are less. So for our project there is no repeat capability. So the level of process maturity is taken as low (6.24).

sf = B + 0.01 x (PREC + FLEX + RESL + TEAM + PMAT)

= 0.91 + 0.01 x (6.2 + 1.01+ 2.83 + 1.1 +6.24)

= 1.0838

The cost drivers considered for our project are listed below:

Product factors

1. Required software reliability (RELY):

It describes the reliability level of developed software product and impact if there is a failure in functioning. As our developing product is food service there is less loss and less effect on human life if it fails to function. So the level of RELY is taken as low (0.92).

2. Software product complexity(CPLX):

It describes the level of complexity in writing the code during the development. As the complexities like the functions, loops, database queries, operations categorize from low level to extreme level so the use of these in our project is not that extreme as we are using only basic level code structure to develop the web application and mainly concentrated on functioning of the website. So level of software product complexity is very low (0.73).

3. Required Reusability (RUSE):

It describes the reuse capability of the code and additional effort needed to construct, as our developing product is done through agile methodology, adding features is the main task in our project so there is nominal use of code in the project. So level of RUSE is nominal (1).

Personnel factors

1. Analyst Capability (ACAP):

It describes the capability of analysts and designer by their abilities and efficiency. In our project there is much cooperation and communication between team members so the requirements and designing can be easily done. The level of Analyst capability in our project is very high (0.71).

2. Programmer Capability (PCAP):

It describes the capability of programmer in coding level. In our project the two experts will communicate with other team members so the understanding about the solving problems can easily done and coordination increases between team. The level of programmer capability in our project is high (0.88).

3. Applications Experience (AEXP):

It describes the experience level in the developing the system application. In our project each individual is experienced in developing a web application in their past so the level of application experience in our project is nominal (1).

4. Platform Experience (PEXP):

It describes the experience level of developing under same platform. In our project as said each individual has some experience in the web project so here we use the same experience for our web application development. So the level of platform experience is nominal (1).

5. Language and Tool Experience (LTEX):

It describes the experience in developing a system application with a language and usage of tools to develop the application. So the level of language and tool experience in our project is nominal (1).

Project factors

1. Use of Software Tools (TOOL):

It describes the usage of tools in system development. In our project, the tools are used in every phase and as agile is selected the tools like daily updates and issues trackers are also used to know the problems in the development. So the level of use of software tool sin our project is high (0.90).

2. Required Development Schedule (SCED):

It describes the schedule plan constraint for the development of product. As in our project there is a well –defined schedule and daily scrum meeting held daily to know the status and problems faced by the team members during the development. So the level of required development schedule in our project is nominal (1).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Cost Drivers/ Scale factors** | **Very Low** | **Low** | **Nominal** | **High** | **Very High** | **Extra High** | **Our estimated value** |
| **Product Factors** | | | | | | | |
| **RELY** | 0.82 | 0.92 | 1 | 1.10 | 1.26 |  | 0.92 |
| **CPLX** | 0.73 | 0.87 | 1 | 1.17 | 1.34 | 1.74 | 0.73 |
| **RUSE** |  | 0.95 | 1 | 1.07 | 1.15 | 1.24 | 1 |
| **Personnel Factors** | | | | | | | |
| **ACAP** | 1.42 | 1.19 | 1 | 0.85 | 0.71 |  | 0.71 |
| **PCAP** | 1.34 | 1.15 | 1 | 0.88 | 0.76 |  | 0.88 |
| **AEXP** | 1.22 | 1.10 | 1 | 0.88 | 0.81 |  | 1 |
| **PEXP** | 1.19 | 1.09 | 1 | 0.91 | 0.85 |  | 1 |
| **LTEX** | 1.20 | 1.09 | 1 | 0.91 | 0.84 |  | 1 |
| **Project Factors** | | | | | | | |
| **TOOL** | 1.17 | 1.09 | 1 | 0.90 | 0.78 |  | 0.90 |
| **SCED** | 1.43 | 1.14 | 1 | 1 | 1 |  | 1 |

Based on the above equation 1, effort is calculated as,

Effort = 2.94 x (3.36)1.0838 x (0.92 x 0.73 x 1 x 0.71 x 0.88 x 1 x 1 x 1 x 0.9 x 1)

= 4.12941 PM.

~ 113 Person hours.

**Estimate allocation of time**

|  |  |
| --- | --- |
| **Tasks** | **Working hours** |
| Meetings | 50 |
| Project Management Plan (PMP) | 240 |
| Sprints(Including daily scrum) | 903 |
| Review and retrospective meetings | 60 |
| Feedback review | 24 |
| Buffer | 83 |
| **Total** | **1360** |

**Initial work plan:**

The following Table 1 describes about the task divided by the team in the project. The detail explanation of resource allocation and task distribution are given in Gantt chart (Daily scrum) in appendix 1.

|  |  |  |
| --- | --- | --- |
| **Task** | **Duration ( working days)** | **Resource Allocation** |
| **Project** | **48** | **All Resources** |
| **Planning** | **06** | **All Resources** |
| **Sprint 1** | **12** | **All Resources** |
| **Sprint 2** | **12** | **All Resources** |
| **Feedback** | **03** | **All Resources** |
| **Sprint 3** | **12** | **All Resources** |
| **Product release** | **01** | **All Resources** |
| **Holidays(Christmas and New year)** | **02** | **All Resources** |

**Table 1: Initial work plan of the Project**

According assumptions, weekends are not considered as working days. Christmas (Dec 25th ) and New year (Jan 1st’16) is also given off for the team.

**Tools/ Resources**

|  |  |
| --- | --- |
| **Task** | **Tools/Resources used** |
| Meetings | Group rooms |
| Communication | WhatsApp, Google drive |
| Project plan | Internet, research articles |
| Documentation | Microsoft word, project, Visio |
| Analysis | Eclipse UML |
| Design | Visio, Eclipse UML |
| Development | Xampp, Notepad++,Java, Team viewer. |
| Testing | Htmlunit, Test Complete, Selenium |

**List of major deliverables**

This part consists of list of major deliverables for our project:

**1. Project plan document**

This document consists of overall plan of the project. That is scope of the project, team member roles and selected methodology for the project, effort estimation, work breakdown structure, quality and risk management plan. This document is provided to investor on November 17th.

**2. Project plan presentation**

The presentation is given by all team members to the investor of the project and explain the plan. The PowerPoint presentation is given on November 24th.

**3. Food service module**

In this the application developed until second sprint is released into market and collect feedback from the customers to improve the quality for the next sprint. This will be released on December 16th.

**4. Food service web application**

This is the final product of the project with improved quality and it is basically the website developed by the team and it will be released on January 8th.

**5. Project final presentation**

The final presentation is given to explain the product details and how to use the product and collect certain feedback. This presentation will be on January 12th.

**6. Individual report**

A report is provided by each individual in the team about how the project went on and what are lessons learned in the project. This will be submitted on January 17th.

**Tracking work and measure the progress**

The plan consists of estimated duration of each task and their sub-tasks. So there is a need of tracking the work, to track the work a burndown chart is used so that how much work is finished and how much work is left can be known. So that daily estimated work is compared with daily completed work and remaining effort is calculated. The burndown cart for each sprint is shown in status reports for detail tracking.

Scrum master measures the progress of all the team members and the project. There are several properties in a project to measure. The key indicators in our project are measuring stakeholder satisfaction, measuring the defects or bugs in our project, measuring the issues arise during requirements or coding phases, measuring the planned deliverables. This way we can know whether the project is going in a planned way or is there extra overhead in the project in terms of effort and time.

Stakeholder satisfaction measure: The important measure is to know the level of stakeholder satisfaction, as stakeholder are key persons in the project these need to be satisfied by delivering a quality product. So to perform it we need to validate the developed product with given requirements so it directly reflects whether stakeholder satisfies or not.

Defects measure(reference): In this the number of defects are measured so that the effort and time required by the team can be known and also it reflects the quality of the code. A benchmark is set for minimum number of defects, by measuring the actual defects and comparing it with benchmark data we can know the progress.

Issues measure: In this the time taken for solving or closing the issues arisen in the project are measured so that time used for non-development activities can be known.

Planned deliverables measure: In this the deliverables which are planned are measured with number of deliverables actually delivered so that remaining deliverables work can be calculated. Also the tasks days are also measured to know how many tasks are completed on date and how many are lagged behind to complete. These can be performed by using Gantt chart as it contains each sub-task finish date so by comparing actual progress with estimated Gantt-chart progress leads to know the remaining effort data.

These measures help us to know the progress of the project and by having good measures it can ensure the project success.

**Risk Management Plan**

These are some of the identified potential risks which are related to our project and the mitigation strategies are detailed in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Risk** | **Probability** | **Impact** | **Risk assessment** | **Mitigation** | **Responsible member** |
| Broad scope | Medium | High | Mitigate | By reducing certain features in the current release of the product and adding them in the future work will minimize the level of the scope. | Product owner (R1) |
| Team members unavailable for the particular work | Medium | High | Avoid | There will be replacement of other member in the absence of particular member who is capable and willing to do the work. | Scrum master (R3) |
| Team dynamics issues  Absence of members for meetings(regular scrum meetings) | Medium  Low | Low  Low |  | All the team members should discuss and deal with issues that occur internally with scrum master and product owner.  The missed scrum meetings should be scheduled immediately by scrum master to track the work done. |  |
| Inaccurate time and effort estimation | -  High | High | Mitigate | The( estimation based on expertise advise) members have to estimate before to change the possible works related to the time and effort. | Expert1-R2 and expert-2 R8 |
| Task delay | Medium | Medium |  | Extra time with the effort should be allocated for some incomplete tasks to finish within time so that the next level of work will not be affected. |  |
| To adapt for Change in technology | Low | Low | Mitigate | The( training will be given) team members should have the minimum knowledge in the technology that is used in the process. | Product owner(R1) |

**Quality plan:**

The action plan has done to analyse and evaluate the quality of the product which is the website, it can be viewed in different perspectives i.e product quality, system as a product, service quality of provider, software product quality and system design #intech framework reference#. Hence the website is assessed with the support of ISO 9126 “Software Quality Characteristics”. These are taken to analyse the quality criteria which is suitable for the features of the product as stated below in the table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristic** | **Sub-Characteristic** | **Related Features in Website** | **Description** |
| Functionality | Suitability | Categories and customer | Simple user interface displaying important and frequent categories. Offers and new products are on the home page. |
| Specific value mentioned. |
| Dashboard |
| Accurateness | Product feel | Trying to help the customers understand the weight, feel and use of the products with the help of pictures.(display of the product with hd pics)  the information provided in the websote are from legitimate resources.  The offers mentioned in the website are exactly the true information provided. |
| Reliable Offers |
| Interoperability | Easily Understood | Easy navigation from one page to another page.  cart load is displayed  pictorial presentation of the products |
| Website Navigation |
| Add to cart option |
| Security | Login emails | secure authentication |
| Reliability | Maturity | Customer Support | Will provide better service to customers by feedback. |
| Usability | Understand ability | Utilize large, professional photos of the product | HD images, flash videos if required to make the customer to get a clear idea of the product. |
| Learnability | differet users | Presenting the latest updates about the products that are available.  Asking the customer to enter his email so that we can keep them updated about our latest products regularly. |
| Operability | Search box | Searching for a product of their choice with the help of search box.  Add to cart option on every page. |
| Add to Reserve cart |
| Efficiency | Time behaviour | Response time |  |
| Loading time | Seasonal products availability time will be clearly displayed. |
|  | resource behaviour | charectrizing resource usage | website consit of images and data whcih doesnt need much bandwidth and storage data |
| Maintainability | Changeability | addtion of features in sprint 2 and three | our product can be changed accoring to the situation as wehave done from sp2-3 |
|  |
|  |
| Stability | Fault tolerance(relaibilty add) | Develop our websites fault tolerantly and also place a fail over server in standby to maintain website availability at any time. |
| Fail over servers |
| Portability | Adaptability |  | our product is adaptble for both mobile and desktop interface |
|
| Conformance |  | transferiing data frm main data base to fail over servers or clloud stoigae as we have used one type of database tool which help in easy portability |