Diagram

Description automatically generated with low confidenceLogo

Description automatically generated with medium confidenceBlood Bank

System analyses and design

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# Section 1. Project Overview

## 1.1 Project Description

**Description**

**Blood donors** *find problems in choosing the nearest places to donate blood and patients in knowing where their blood types are available and how many blood bags they have too ,so this system improve blood banks in Egypt and to*

*develop a blood bank information system which focuses on making an online*

*system that is accessible for both donors and administrators. Donors can directly*

*receive information regarding their previous blood donations, including their blood*

*results and donation history, in order to easily schedule their next donations.*

*The system is also developed for the administrators, who are the main authority in he system. Administrators can add, modify, delete, and query any donation*

*information if necessary. The administrator is also responsible for responding to the hospital’s blood requests and checking the stocks in the blood bank’s inventory.*

## 1.2 Project Scope

*The proposed software product is the Blood Bank Management System (BBMS). The system will be used in any Hospital, Dispensary or Pathology labs to get the information from the donors then storing that data for future usage.*

*The current system in use is a paper-based system. It is too slow and cannot provide updated lists of donors within a reasonable timeframe. The intentions of the system are to reduce over-time pay. Requirements statements in this document are both include and exclude .*

| **Project Includes** |
| --- |
| Desktop application |
| Mobile applications |
| Training for staff |
| System functions |
| Databases |
| Blood groups |
| Stock |

| **Project Excludes** |
| --- |
| Hospital system |
| Blood bank Devices |
| Networks |

## 1.3 Assumption

*Some assumptions that hinder the movement of the system must be made, including assumptions related to donors, the hospital, or the staff .*

| **Assumptions** |
| --- |
| All hospitals have internet connection |
| Specialists they responsible for system |
| Devices to run system |
| GPS in client devices |

## 1.4 Constraints

|  |
| --- |
| **Constraints** |
| Cost |
| Time |
| Quality |
| Resources |
| Scope |

# Section 2. Project Start-Up

## 2.1 Project Life Cycle

*Project Life Cycle include number of phases (Planning – Analysis – Design – Implementation – Testing)*

*To start with this system, one must go through steps, starting from planning to implementation we start with the*

*-Planning phase :- in which a way to collect data and information about donors is known, whether through their communication with the receptionist through some questions, sufficient information is taken about the donor in terms of (name - age - address - etc.)*

*Or by registering on the blood bank’s website with a donor’s account and filling in the form with the required data and communicating with the blood bank online for any postponement or medical consultation request*

*Also during the systems planning and selection phase, an organization determines whether resources should be devoted to the development or enhancement of each information system under consideration.*

*And feasibility study done to determine the economic and organizational impact of the system.*

*-Analysis phase: Blood bank management system is designed to arbitrate and store donor and blood bags information available to recipient and staff information with effective and efficiency system by achieve these service in few time and requirement resources.*

*We should specify the system requirement by determining the requirements of the device necessary to operate the system and determining the type of employees to deal with the system, and they can be given training in order to realize how to handle it well.*

*Determine the parts of the blood bank and who is responsible for each part and its importance for providing it in the system:*

*Staff :-*  *this unit Responsible for all dealings and blood bank requirements and providing all necessary services to donors and recipients*

-Deign Phase : in this phase we design and integrate data base , design ERD Entity Relationship Diagrams) , and Create Tables and *design the user interface* ,d*esign and integrate system controls.*

-Implementation: in this phase we *Build the GUI:*

1-Create interface Frames

*2-Implement the software functions* : Create System controls and Software Function .

-Testing phase :

*1-Software Testing :* Testing System Functions .

*2-Make sure there are no Errors*: Debugging Errors and fixed it if exist .

|  |  |  |
| --- | --- | --- |
| Phase | Activities | Sequence |
| Planning | *1-Define project problem and scope.*  *2-Produce detailed project schedule.*  *3-Confirm project feasibility.*  *4-Determine initial staff for project.*  *5-Determine Risk and Resources of project.* | **Phase #1** |
| Analysis | 1*-Gather information to learn problem domain.*  *2-Define system requirements*.  *3-prioritize requirements*  *4-Generate and evaluate alternatives.*  *5-Review recommendation with management.* | **Phase #2** |
| Design | *1-Design and integrate data base.*  *2-Design the user interface.*  *3-Design and integrate system controls.* | **Phase #3** |
| Implementation | *1-Build the GUI.*  *2-Implement the software functions*. | **Phase #4** |
| Testing | *1-Software Testing.*  *2-Make sure there are no Errors*. | **Phase #5** |
| Installation | *Install the system* | **Phase #6** |

## 2.2 Methods, Tools, and Techniques

***Techniques***:

Desktop & Mobile application.

Database.

***Methods***:

**Java, MySQL, GUI**

***Tools:***

**NetBeans** for building desktop application.

**Android** **studio** for Mobile application.

**Workbench** to create database.

**Adobe XD** (for ERD) Microsoft Project

## 2.3 Estimation Methods and Estimate

*Describe the methods used to estimate the project level of effort, schedule, and budget. Include tools and techniques used to obtain the estimates in the description. Provide estimates for the project dimensions (effort, schedule, and budget), and identify the source or basis of the estimates and the level of uncertainty and risk associated with the estimates.*

|  |  |
| --- | --- |
| Description | As we ask specialists who has a reputation for Knowledge of the particular field and experience in estimating activity duration within, we use such duration estimates as a superior to internally generated ones. |
| Effort in person months or person hours | Hours |
| Schedule in calendar months | **4 months** |
| Budget | 25000 |
| Level of Uncertainty | 10% (delay in earlier project phases – external  factors – low knowledge level of end-users) |

## 2.4 Schedule Allocation

|  |  |
| --- | --- |
| Activities | Efforts |
| *1-Define project problem and scope.*  *2-Produce detailed project schedule.*  *3-Confirm project feasibility.*  *4-Determine initial staff for project.*  *5-Determine Risk and Resources of project.* | 5 Days  4 Days  4 Days  3 Days  6 Days |
| *1-Gather information to learn problem domain.*  *2-Define system requirements.*  *3-prioritize requirements.*  *4-Generate and evaluate alternatives.*  *5-Review recommendation with management.* | 7 Days  7 Days  3 Days  5 Days  4 Days |
| 1. *Design and integrate database* 2. *Design the user interface* 3. *Design and integrate system controls* | 5 Days  6 Days  3 Days |
| 1. Build the GUI 2. Implement the software functions 3. Software Testing 4. Installation | 1. Days   12 Days  14 Days  9 Days |

|  |  |  |
| --- | --- | --- |
| Activities | Start Date | End Date |
| *1-Define project problem and scope.*  *2-Produce detailed project schedule.*  *3-Confirm project feasibility.*  *4-Determine initial staff for project.*  *5-Determine Risk and Resources of project.* | 1/3/2022  8/3/2022  8/3/2022  14/3/2022  14/3/2022 | 7/3/2022  11/3/2022  11/3/2022  16/3/2022  21/3/2022 |
| *6-Gather information to learn problem domain.*  *7-Define system requirements.*  *8-prioritize requirements.*  *9-Generate and evaluate alternatives.*  *10-Review recommendation with management* | 22/3/2022  31/3/2022  11/4/2022  14/4/2022  21/4/2022 | 30/3/2022  8/4/2022  13/4/2022  20/4/2022  26/4/2022 |
| *11-Design and integrate database*  *12-Design the user interface*  *13-Design and integrate system controls* | 27/4/2022  4/4/2022  12/5/2022 | 3/5/2022  11/5/2022  16/5/2022 |
| 14-Build the GUI  15-Implement the software functions  16-Software Testing  17-Installation | 12/5/2022  26/5/2022  26/5/2022  15/6/2022 | 25/5/2022  10/6/2022  14/6/2022  27/6/2022 |

## 2.5 Resource Allocation

*The total number of Resources of project such as table of donner, table of staff, table of recipient, table of blood groups, table of log . The next step to use the resources make relations between the tables.*

*The timeframe to start and End: suppose take* ***16*** *weeks to finish project.*

|  |  |
| --- | --- |
| **Tasks** | **Recourses** |
| *1-Define project problem and scope*  *2-Produce detailed project schedule*  *3-Confirm project feasibility*  *4-Determine initial staff for project*  *5-Determine Risk and Resources of project* | Analyst, computer tool draw WBS  Project manager  Project manager, computer tool such as Gantt Designer to draw Gantt chart  Analyst project manager  Analyst project manager |
| *1-Gather information to learn problem domain*  *2-Define system requirements*  *3-prioritize requirements*  *4-Generate and evaluate alternatives*  *5-Review recommendation with management.* | Analyst, question method  Analyst computer tool  Analyst question method  Project manager  Project manager |
| *1-Design and integrate (Database)*  *2-* *Design the user interface*  *3-* *Design and integrate system controls* | Database analyst  Programmer  Programmer |
| *-1build the GUI.*  *2-* *Implement the software functions*  *3-* Software Testing  *4-install the system* | Programmer  Programmer  Tester  Tester |

## 2. Budget Allocation

|  |  |  |
| --- | --- | --- |
| Key Budget Category | Budget Amount | Time Period (Day) |
| *Define project problem and scope.* | 1500 | 5 |
| *Produce detailed project schedule* . | 1000 | 4 |
| *Confirm project feasibility.* | 2000 | 4 |
| *Determine initial staff for project.* | 2200 | 3 |
| *Determine Risk and Resources of project.* | 3000 | 6 |
| *Gather information to learn problem domain* | 1000 | 7 |
| *Define system requirements.* | 1500 | 7 |
| *prioritize requirements.* | 800 | 3 |
| *Generate and evaluate alternatives.* | 750 | 5 |
| *Review recommendation with management* | 900 | 4 |
| *Design and integrate database* | 2500 | 5 |
| *Design the user interface* | 2500 | 6 |
| *Design and integrate system controls* | 350 | 3 |
| Build the GUI | 1000 | 10 |
| Implement the software functions | 1500 | 12 |
| Software Testing | 1200 | 14 |
| Installation | 1300 | 9 |

# 

# Section 3. Risk Management

*Once we recognize that traditional “one size” approaches simply don’t fit the realities of dynamic organizations and wide-ranging project complexities, it becomes clear that a scalable solution to project management is required. This allows us to flexibly increase and decrease resource assignments depending on specific project needs and our resource capacity. Without a scalable approach, our ability to balance and adjust resources for current and future project needs is restricted to our resource pool, and we may find ourselves realizing halfway through a project that it requires additional resources that are committed elsewhere.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk Description** | **Probability** | **Impact** | **Strategy** |
| *Cost Estimates Unrealistic* | Low | High | *Using tools with low cost* |
| *Time Estimates Unrealistic* | Low | Low | *Increase working hour* |
| *Team Size* | Low | High | *Alternative members* |
| *Information Security* | Low | High | *Hiring a cyber security specialist* |
| *Low Knowledge Level of End-User* | High | Low | *Provide ways for users to practice and learn* |

# Section 4. Network diagram AND (Gantt chart)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **task** | **Activity** | **Preceding** **event** | **Et** | **TE** | **Tl** | **Slake** | **Critical** **path** |
| 1 | *Define project problem and scope.* |  | 5 | 5 | 5 | 0 | YES |
| 2 | *Produce detailed project schedule* | 1 | 4 | 9 | 9 | 0 | YES |
| 3 | *Confirm project feasibility.* | 1 | 4 | 9 | 9 | 0 | YES |
| 4 | *Determine initial staff for project.* | 2 | 3 | 12 | 37 | 25 | NO |
| 5 | *Determine Risk and Resources of project.* | 2,3 | 6 | 15 | 15 | 0 | YES |
| 6 | *Gather information to learn problem domain.* | 5 | 7 | 22 | 22 | 0 | YES |
| 7 | *Define system requirements.* | 6 | 7 | 29 | 29 | 0 | YES |
| 8 | *prioritize requirements* | 7 | 3 | 32 | 32 | 0 | YES |
| 9 | *Generate and evaluate alternatives* | 8 | 5 | 37 | 37 | 0 | YES |
| 10 | *Review recommendation with management* | 4,9 | 4 | 41 | 41 | 0 | YES |
| 11 | *Design and integrate database* | 10,7 | 5 | 46 | 46 | 0 | YES |
| 12 | *Design the user interface* | 11 | 6 | 52 | 52 | 0 | YES |
| 13 | *Design and integrate system controls* | 11,12 | 3 | 55 | 62 | 7 | NO |
| 14 | Build the GUI | 12 | 10 | 62 | 62 | 0 | YES |
| 15 | Implement the software functions | 14.13 | 12 | 74 | 76 | 2 | NO |
| 16 | Software Testing | 14,13 | 14 | 76 | 76 | 0 | YES |
| 17 | Installation | 16,15 | 9 | 85 | 85 | 0 | YES |

A picture containing red, wooden, wood, set

Description automatically generated

Graphical user interface

Description automatically generated

# Requirements

## Interview Questions

***First: People who work in blood bank field***

***1-Introduce yourself.***

***Answer: I am Romany, I am 32 years old, I live in Cairo, and I worked here since 2015.***

***2-What’s your work here?***

***Answer: I am working here as technical personnel.***

***3-What is this job?***

***Answer:*  *working with and test all blood donations*** blood ***from a bank, or the patient’s donation.***

***4-*** ***What is the general blood donation criteria ?***

***Answer: Donors must:***

* ***be at least 16 years of age***
* ***weigh at least 110 pounds (lb.)***
* ***not have mild illnesses, such as a***[***cold***](https://www.medicalnewstoday.com/articles/166606)***or the***[***flu***](https://www.medicalnewstoday.com/articles/15107)
* ***not have unmedicated***[***diabetes***](https://www.medicalnewstoday.com/articles/323627)***,***[***anemia***](https://www.medicalnewstoday.com/articles/158800)***, or***[***hypertension***](http://www.medicalnewstoday.com/articles/150109)***(high***[***blood pressure***](http://www.medicalnewstoday.com/articles/270644)***).***

***5-*** ***What are some pre-transfusion tests that should be performed?***

***Hepatitis B – HBsAg Human immunodeficiency virus – anti-HIV 1 and 2 and HIV NAT (nucleic acid testing) Hepatitis C – anti-HCV and HCV NAT Human T-cell lymphotropic virus – anti-HTLV I and II Syphilis – syphilis antibodies.***

***6-Can you tell me what are blood types?***

***Answer :the 8 most common blood types (***[***A+, A-***](https://www.redcrossblood.org/donate-blood/blood-types/a-blood-type.html)***,***[***B+, B-***](https://www.redcrossblood.org/donate-blood/blood-types/b-blood-type.html)***,***[***O+, O-***](https://www.redcrossblood.org/donate-blood/blood-types/o-blood-type.html)***,***[***AB+, AB-***](https://www.redcrossblood.org/donate-blood/blood-types/ab-blood-type.html)***)***

***7- Can you explain some functions of blood to me?***

***Answer:* *Functions of Blood The primary function of blood is to deliver oxygen and nutrients to, and remove wastes from, the body cells; but that is only the beginning of the story. The specific functions of blood also include defense, distribution of heat, and maintenance of homeostasis.***

***8- What can you tell me about blood plasma?***

***Your blood can be separated into four components, one of them being plasma. The other three are:***

***-red blood cells***

***-white blood cells***

***-platelets***

***Plasma makes up about 55 percent of your blood. It carries out several key functions in the body, including transporting waste products.***

***Read on to learn more about plasma, including what it’s made of and its many functions.***

***-Main functions: One of plasma’s main functions is the removal of waste from cellular functions that help to produce energy. Plasma accepts and transports this waste to other areas of the body, such as the kidneys or liver, for excretion.***

***9-*** ***How would you respond to an emergency at work?***

***Answer:*** ***That really depends on the situation. I always try to remember to remain as calm as possible and report to my designated area as quickly as possible and follow emergency protocol.***

***10-*** ***If you were the person responsible for hiring new employees, what qualities would you look for in a candidate, and do you think you possess those qualities?***

***Answer: I believe that honesty is important no matter what job title a person holds. I have found that being honest with people creates an atmosphere of mutual trust and respect. Those qualities, I feel, are essential when building rapport with patients and co-workers.***

***11-What’s your opinion about the blood bank system in your organization?***

***Answer: I think our blood bank system needs to be improved.***

***12-What do you need to improve this blood bank system?***

***Answer: I think it needs to be more efficient and good enough to response doner’s requirements and save costs and time to them .***

***Second: People who donate in blood bank.***

***Questions:***

***1-Introduce yourself.***

***Answer: I am Nour, I am 20 years old, I live in Benha and I am student in Benha university.***

***2- Did you donate before?***

***Answer: yes.***

***3- How many times have you donated blood?***

***Answer: 3 times.***

***4-What is your opinion about the blood bank system?***

***Answer: I think it is good but needs to be improved to be more rapid in its performance to save time & costs.***

***Thanks for your helping and we will improve our system and solve these problems you faced.***

## Questionnaire

*Questions*

**1.Is the current system working well?**

**1. yes**

**2.no**

**2. Does everyone know how to deal with the current system?**

**1. yes**

**2.no**

**3. How is donor data recorded?**

**1.manual**

**2.automatically**

**4. Do employees enjoy working or not?**

**1.yes**

**2.no**

**5. Is the blood bank internet-connected?**

**1.yes**

**2.no**

**6. Which one will improve the blood bank, a new system, or the development of the current system?**

**1.new one**

**2.develop the current system**

**7. Are there technical experts?**

**1.yes**

**2.no**

**8. Which would I prefer to have a local or large-scale system?**

**1. local**

**2. large-scale system**

**9. Will a new system affect the performance of the blood bank?**

**1.yes**

**2.no**

**10. What is the percentage of blood bank's reliance on technology**

**1. 20%**

**2. 60%**

**1. 80%**

**2 .100%**

***Questionnaire***

***Analysis***

**1.Is the current system working well?**

**2. Does everyone know how to deal with the current system?**

**3. How is donor data recorded?**

**4. Do employees enjoy working or not?**

**5. Is the blood bank internet-connected?**

**6. Which one will improve the blood bank, a new system, or the development of the current system?**

**7. Are there technical experts?**

**8. Which would I prefer to have a local or large-scale system?**

**9. Will a new system affect the performance of the blood bank?**

**10. What is the percentage of blood bank's reliance on technology**

***The requirements that were obtained:***

**1-new system**

**2- database**

**3-staff department**

**4- website**

**5- desktop application**

**6- android application**

**7- GUI**

**8- connection between other systems**

**9- technical experts**

**10- Staff training**

# Data Flow diagram

**Context Diagram**Diagram

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**Diagram

Description automatically generatedLevel 0**

# ERD

Diagram

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Graphical user interface

Description automatically generatedGraphical user interface, application

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Diagram

Description automatically generated with medium confidenceDiagram

Description automatically generated

Graphical user interface, text, application

Description automatically generatedA screenshot of a computer

Description automatically generated with low confidence

Graphical user interface, application

Description automatically generatedApplication

Description automatically generated with medium confidence