

**İZMİR UNIVERSITY OF ECONOMICS
FACULTY OF ENGINEERING**

Software Development Plan



ANIMAL ADOPTION SYSTEM

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1) Overview

1.1) Introduction

There are too many hungry and sick stray animals in need of care on the streets. These animals are dying of apathy and hunger. In this project we will try to solve this problem.

There are several animals outside that are lost or trying to survive in streets and climatic conditions makes it difficult for those animals. That is why we are trying to develop animal adoption system and help those animals to survive. This is how we can reduce animal deaths and make people aware of street animals.

In this project, we want to create a safer living place for animals by partnering them up with owners who can take care of them. First, we will scan our environment as much as we can to identify stray animals that needs our help. After that, we will try to provide them food and find shelters if possible until we find an appropriate owner. In addition, we will return the lost animals to their owners.

1.2) Goals

- To be able to give homes to many stray animals on the streets.
- To improve the quality of life of street animals.
- Finding lost animals and reuniting them with their owners.
- Keeping track of the owners with the track to ensure that the adopted animals continue their lives in a safe environment.
- To make people accept that animals are living things like humans in order to prevent the animal abuse.

2) High-Level Functionality

2.1) Functional Requirements

1. The system should take username, password, and social security number to login.
2. The system should give higher priority to older posts.
3. The system should allow users to check posts, share a new post and send an adoption request.
4. If someone wants to adopt an animal, human resources manager should check whether adopter is suitable or not.

5. If the adopter is suitable system informs them that they must give us a permission to check on the adopted animal occasionally.
6. To use all the features, the program offers to users that they must share their location, camera access and storage access permission.
7. To use this application, the user must have a stable internet connection.
8. The system should moderate itself by checking if the uploaded image only contains nothing but a pet.

2.2) Non-Functional Requirements

1. The system should be available on IOS 14 and Android 12.
2. The system should be working on 24/7.
3. The main page should send a refresh request every 3 minutes to user.
4. The system should have at least 100MB free space for it to work.
5. Privacy of information, intellectual property rights, etc. should be audited.

3) Stakeholders

1) Developers: Developers who are working on the project can benefit from the project's success by adding it to their CV and getting financial income.

2) Customers: They can help us by using the app and recommending it to their friends. For each animal that is reported to our system and approved by our field teams, they will win a gift card from the sponsors.

3) Managers: Managers will be able to benefit from the success of the project by adding this project to their resume and financially.

4) Animal Rights Activists: They can make our project known by using our project in their own campaigns. At the same time, we help them by adopting animals.

5) Shareholders: Our primary source of income. They will help us cover project expenses and will benefit from our project's success by having shares.

6) Advertisement: Our secondary source of income. They will benefit from introducing themselves to people through our program and they will also introduce us to people.

7) Media: They will announce our project which we are doing voluntarily in newspapers, on television and on the internet.

8) Government: Government will benefit from our project by taxes and costs.

9) Stray Animals: Stray animals will be adopted, they will get better food and live in better conditions.

4) Project Staffing

1) UX Designer: A software developer who works in the development of the user interface (UI) is called UX designer. The user interfaces include visual elements like layouts and aesthetics. In this project, UX designers will design an interface that is comprehensible and easy to use for the users.

2) Back-End Developer: A software developer who specializes in the underlying logic and performance of the application is called a back-end developer. They often design and implement the core logic, keeping in mind scalability. They do this by integrating with data systems. In this project, these developers will implement the core of the project.

3) Security Developer: A software developer who specializes in creating systems, methods, and procedures to test the security of a software system and exploit and fix security flaws is called a security developer. In this project, security developers will maintain the security of the system.

4) Project Manager: The task of project managers is to ensure integration in the project. Planning resource and time management. Deciding on priorities and layout in the project. Deciding on the tools to be used in the project. Supervises project members and assigns them to jobs that match their abilities. It deals with the reporting part of the project. In this project, the project manager is the leader of the project. The project manager makes important decisions about the project.

5) Quality Assurance Engineer (QA): A QA engineer is a software engineer who is in charge of writing software to ensure the application's quality. QA engineers develop automated tests, tools, and methods to ensure that products and processes run properly. In this project, QA engineers check the software's quality.

6) Human Resources Manager: Human resources managers plan, coordinate, and direct the administrative functions of an organization. In our project, human resources managers check whether adopter is suitable or not.

7) Site Moderators: Site Moderators are the people who responsible for managing and maintaining the commenting community for a given website or application. They are the first person to contact if you're having trouble with moderation on a given application or site. In our project, site moderators are responsible for adding animals to bulletin. In addition, they are responsible for the support.

5) Software Process Model

5.1) Needs From The Organizational Process

5.1.1) Necessary Needs From The Organizational Process

1. Throughout the development stages changes can be implemented.
2. We want that the important functionality is delivered to the client early.
3. We need to develop prioritized requirements first.
4. Our requirements are well-understood.
5. We need to notice errors more easily
6. Our software engineering team are not very well skilled or trained.
7. We need the customers' feedback.
8. Project should be easier to test and debug.
9. We need a flexible model.

5.1.2) Unnecessary Needs From The Organizational Process

1. The total cost of the project is high.
2. The good planning is needed.
3. Well defined module interfaces are required.
4. The whole system needs to be defined clear and complete.
5. The total time of the project may be extended

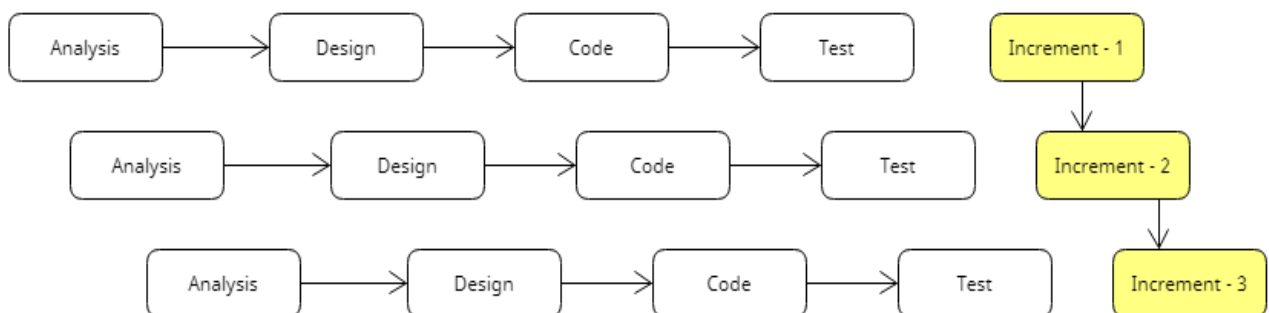
5.2) Software Development Model

SOFTWARE PROCESS NAME: Incremental Model

5.2.1) Software Process Description

- First, we analyze our requirements. In this phase, requirements are broken down into increments. We tackled the highest priority requirements first. Other requirements are frozen until the increment is complete.
- Then we decide what kind of design the program will have.
- According to the design and requirements we have determined, we will move on to the code phase of the project.
- Then we move on to the testing phase.
- After the testing stage is finished, the first increment is delivered.
- We are going to complete the project in increments by repeating these stages.

5.2.2) Software Process Model



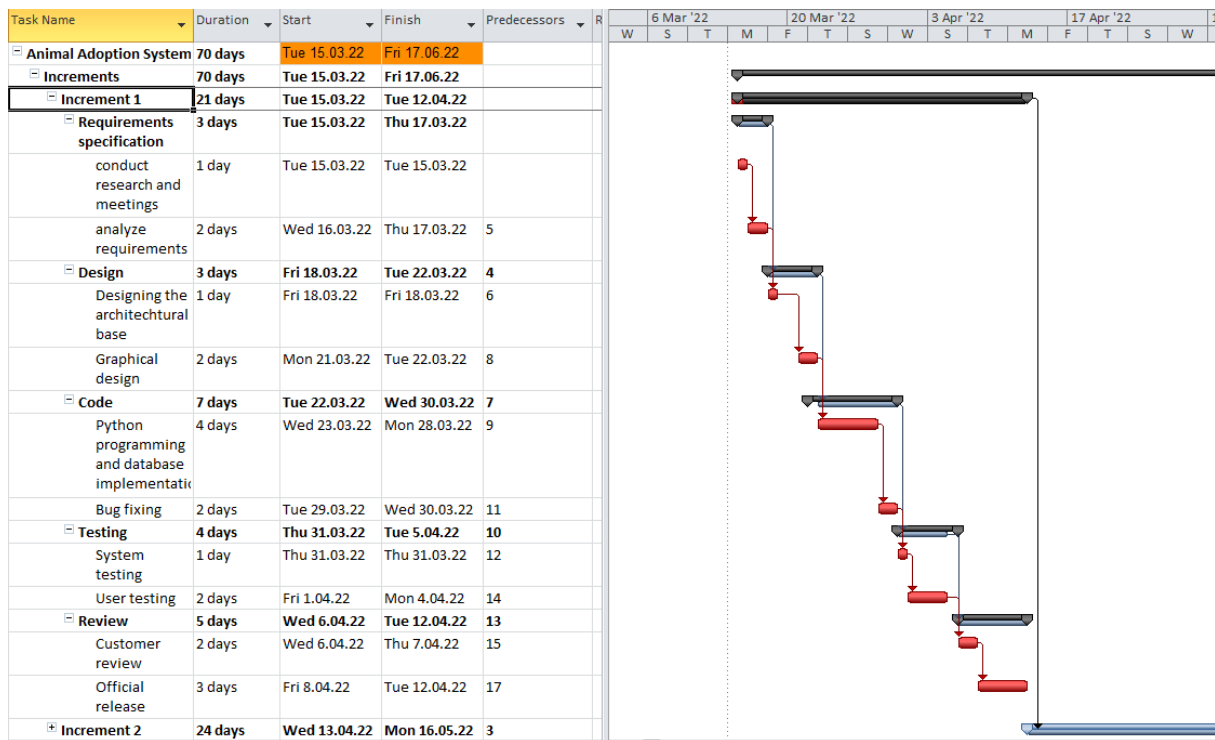
5.2.3) Reasons To Choose This Model

- We decided that incremental model is the most suitable approach we can take for implementing this project.
- Our requirements are clearly understood.

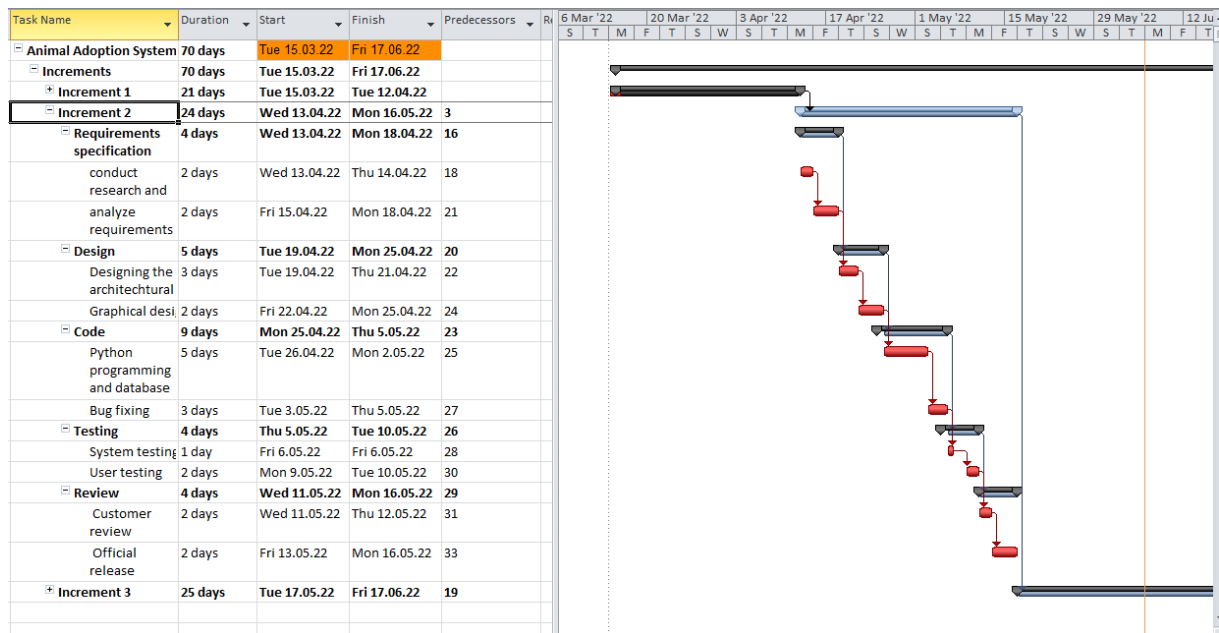
- We want that customers can respond to features and review the product for any useful changes.
- We want to test and debug easily.
- The team members are not well-skilled.
- We want to be able to make changes during the development process.

6) Schedule and Effort

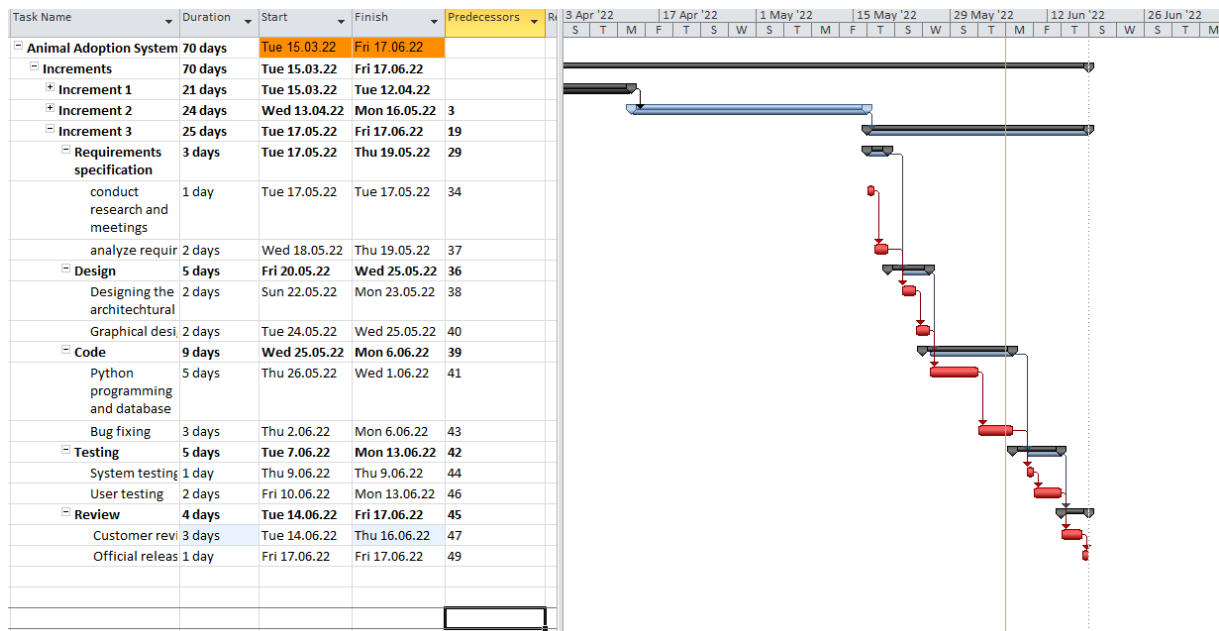
Increment 1



Increment 2



Increment 3



7) Measurements

7.1) Specifying Measurements

1) Question to identify measurements:

- How successful were the testing phases in revealing flaws for each increment?

2) Identified measurements:

- The total number of unsuccessful tests for each increment
- The total number of tests conducted for each increment
- The total number of flaws found for each increment

3) Measurement storage and collection:

What: The number of flaws

When: After every test case

Format: Real Number Data

How: Recorded after each increment report by tester

7.2) Example Measurements

1. Project Size - How large is the project? - Lines of Test Code
2. Project Timetable - Was it done on schedule or did it take longer than expected? - Time spent for the whole project
3. Integrity - Does the system work as intended based on implementation? - Implementation defects that are found in each test.
4. Speed - How quick is the system when it's in use? - Speed of data processing
5. Cost - Cost of the project during design. - Software design costs.
6. Errors - Syntax errors in code during implementation - Syntax Errors

8) Project Risks

8.1) Likelihood Risk List

LIKELIHOOD RANK	RISK DESCRIPTION
1	Requirements- Requirements may be defined incorrectly by customer or inaccurate so it may slow down the process.
2	Technology- The technological possibilities we have may not be enough to complete the project.
3	Budget- Limited or insufficient budget may cancel or slow down the project.
4	Testing- While testing the system, premature or incorrect testing may cause undesirable results and change system implementation.
5	Health and safety – Some animals may be in such a bad situation that they cannot be saved.
6	Performance- Some group members may be behind the Schedule or system may not work as good as it was planned.
7	Cooperation- Some members may refuse to cooperate or group manager may fail to manage team properly.
8	Tools- Improper usage of tools or poor tool selection may cause group to implement system slower or incorrect.
9	Schedule- We may not be able to complete the project until deadline and we may experience problems both financially and morally.
10	Skill resources – Developers, designers and managers may not have enough skills required for the project.
11	Miscommunication- If team cannot manage to communicate, it will be too hard to complete the Project.
12	Advertisement- If we can't get enough help from advertising companies, we can't reach to corresponding audience.
13	Legal Risks- When the project is completed, we may have legal problems with stakeholders or third parties.

8.2) Impact Risk List

IMPACT RANK	RISK DESCRIPTION
1	Budget- Limited or insufficient budget may cancel or slow down the project.
2	Tools- Improper usage of tools or poor tool selection may cause group to implement system slower or incorrect.
3	Advertisement- If we can't get enough help from advertising companies, we can't reach to corresponding audience.
4	Requirements- Requirements may be defined incorrectly by customer or inaccurate so it may slow down the process.
5	Miscommunication- If team cannot manage to communicate, it will be too hard to complete the project.
6	Cooperation- Some members may refuse to cooperate or group manager may fail to manage team properly.
7	Performance- Some group members may be behind the Schedule or system may not work as good as it was planned.
8	Testing- While testing the system, premature or incorrect testing may cause undesirable results and change system implementation.
9	Schedule- We may not be able to complete the project until deadline and we may experience problems both financially and morally.
10	Technology- The technological possibilities we have may not be enough to complete the project.
11	Skill resources- Developers, designers and managers may not have enough skills required for the project.
12	Health and safety – Some animals may be in such a bad situation that they cannot be saved.
13	Legal Risks- When the project is completed, we may have legal problems with stakeholders or third parties.

8.3) Combined Risk List

RISK DESCRIPTION	LIKELIHOOD RANK	IMPACT RANK	COMBINED RANK
Budget- Limited or insufficient budget may cancel or slow down the project.	3	1	4
Requirements- Requirements may be defined incorrectly by customer or inaccurate so it may slow down the process.	1	4	5
Tools- Improper usage of tools or poor tool selection may cause group to implement system slower or incorrect.	8	2	10
Performance- Some group members may be behind the Schedule or system may not work as good as it was planned.	4	7	11
Technology- The technological possibilities we have may not be enough to complete the project.	2	10	12
Cooperation- Some members may refuse to cooperate or group manager may fail to manage team properly.	7	6	13
Testing- While testing the system, premature or incorrect testing may cause undesirable results and change system implementation.	6	8	14
Advertisement- If we can't get enough help from advertising companies, we can't reach to corresponding audience.	12	3	15
Miscommunication- If team cannot manage to communicate, it will be too hard to complete the project.	11	5	16
Health and safety – Some animals may be in such a bad situation that they cannot be saved.	5	12	17
Schedule- We may not be able to complete the project until deadline and we may experience problems both financially and morally.	9	9	18
Skill resources– Developers, designers and managers may not have enough skills required for the project.	10	11	21
Legal Risks- When the project is completed, we may have legal problems with stakeholders or third parties.	13	13	26

9) Software Tools

PROJECT TASKS WHICH REQUIRE SOFTWARE TOOL SUPPORT

- 1) Database
- 2) Integrated Development Environment for Python
- 3) Graphical User Interface

9.1) Database

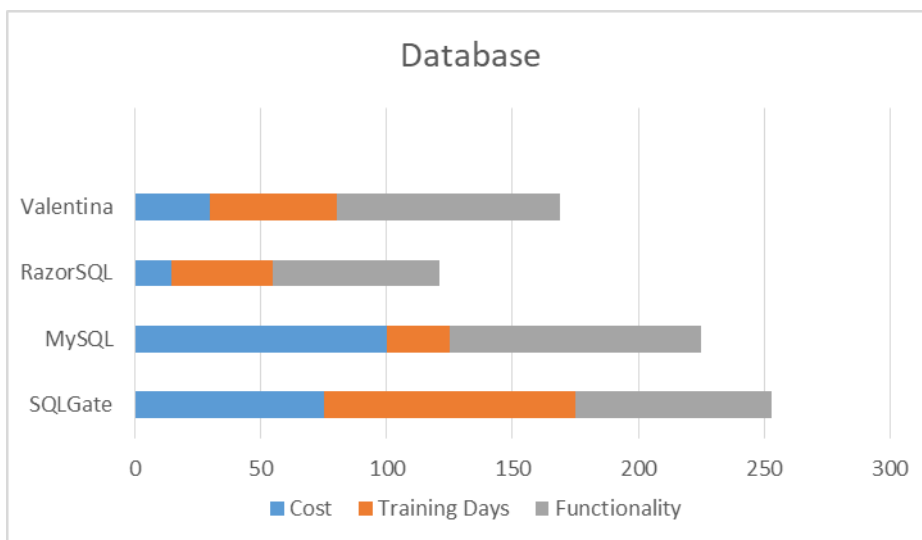
Tool Cost/Training/Functionality Data

Tool	SQLGate	MySQL	RazorSQL	Valentina
Cost	1500	2000	290	600
Training Days	20	5	8	10
Functionality	70	90	60	80

Normalized Cost/Training/Functionality Data

Tool	SQLGate	MySQL	RazorSQL	Valentina	Valentina
Cost	75	100	14.5	30	
Training Days	100	25	40	50	
Functionality	77.78	100	66.67	88.89	

Normalized Tool Graph



Which tool has been selected? Why?

We selected MySQL. Although it has a higher price than others, it has a higher functionality and lower training days which might come handy in later phases of development. It has been tested on over 40 databases, can connect to databases with Python.

9.2) Integrated Development Environment for Python

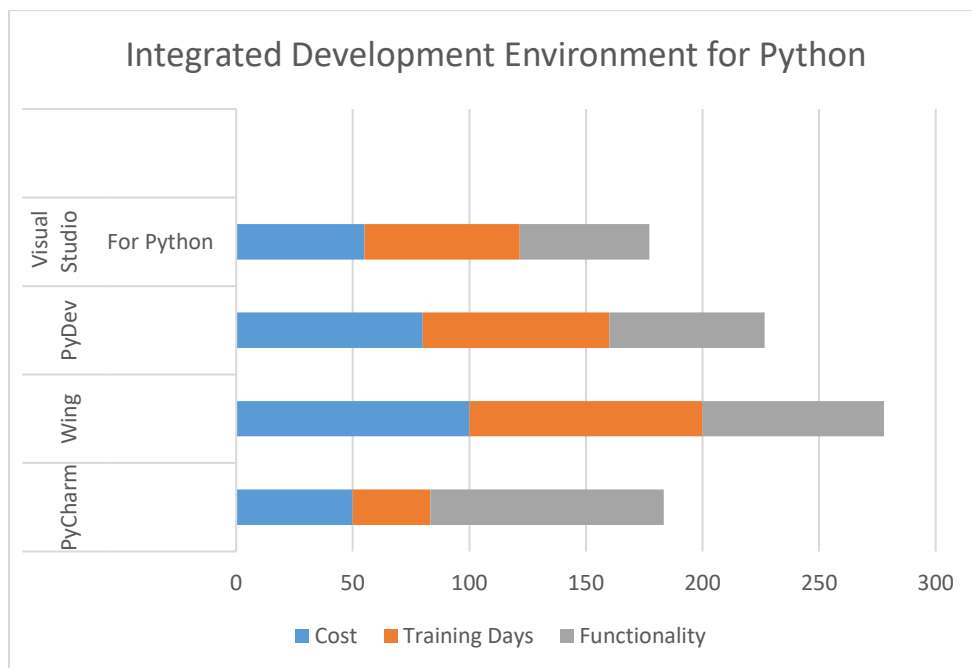
Tool Cost/Training/Functionality Data

Tool	PyCharm	Wing	PyDev	Visual Studio for Python
Cost	1500	3000	2400	1650
Training Days	5	15	12	10
Functionality	90	70	60	50

Normalized Cost/Training/Functionality Data

Tool	PyCharm	Wing	PyDev	Visual Studio For Python
Cost	50	100	80	55
Training Days	33.33	100	80	66.67
Functionality	100	77.78	66.67	55.56

Normalized Tool Graph



Which tool has been selected? Why?

We picked PyCharm for our Python Integrated Development Environment. It has lower cost and lower training days and higher functionality. PyCharm provides smart code completion, code inspections, on-the-fly error highlighting and quick-fixes, along with automated code refactorings and rich navigation capabilities.

9.3) Graphical User Interface

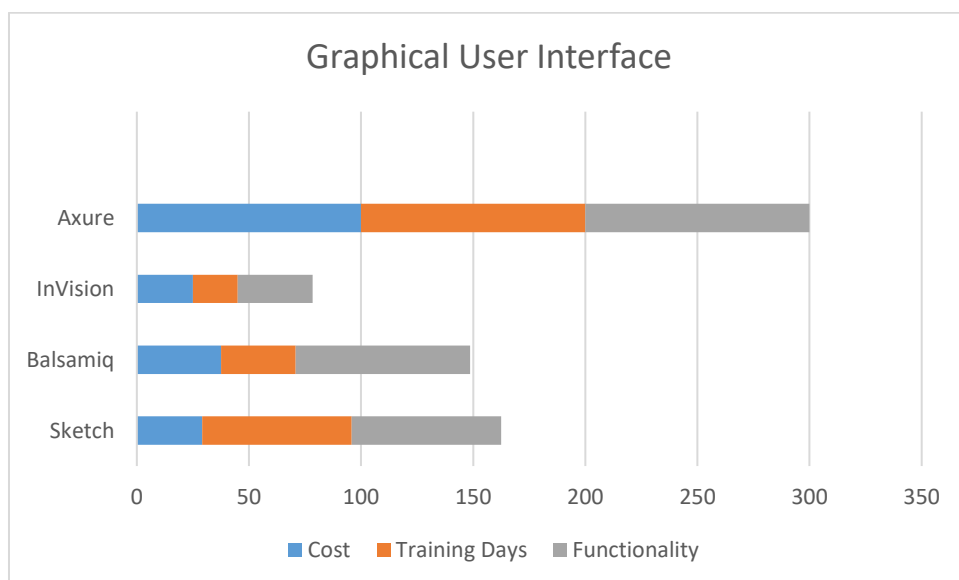
Tool Cost/Training/Functionality Data

Tool	Sketch	Balsamiq	InVision	Axure
Cost	350	450	300	1200
Training Days	10	5	3	15
Functionality	60	70	30	90

Normalized Cost/Training/Functionality Data

Tool	Sketch	Balsamiq	InVision	Axure
Cost	29.17	37.50	25	100
Training Days	66.67	33.33	20	100
Functionality	66.67	77.78	33.33	100

Normalized Tool Graph



Which tool has been selected? Why?

Balsamiq is a very popular interface design program. It works through browser which is important for us because we may be working through different computers. It also has an online whiteboard for our team that we can plan our design. We can learn it in fewer days and it has a simple UI.

10) Project Needs

10.1) Software Needs

- 1) Operating Systems: Application must be working on supported systems and those systems must be up to date to operate it.

Minimum Versions: IOS 14 for IOS, Android 12 for Android.

- 2) Compiler: To develop the application, a proper IDE for the best of the project is required.

Minimum Versions: PyCharm 2020.3.4

- 3) Recognition System: Checking the file that is uploaded to application if it is an animal picture or not.

- 4) Live Support System: A communication system to communicate rapidly and stay in touch between customers and live support.

Gmail, Outlook

- 5) Database: A database must exist to operate data processing operations.

Minimum Versions: MySQL Version 5.7.36

- 6) Project Documentation: A document that is being arranged by project manager such as Word to track who is doing what, what is being created and problems encountered during development.

Minimum Versions: Office 365 Version 2110

- 7) Communication App: A cloud-based video communication app that allows development team to organize meetings such as Zoom.

Minimum Versions: Zoom Version 4.6

10.2) Hardware Needs

- 1) RAM: Minimum 2GB or more, memory improves the performance.
- 2) Hard disk: Minimum 10 GB of free disk space.
- 3) Computer/ Processor: Minimum 2 GHz Intel processor or more
- 4) Operating System: Minimum Android 12 or IOS14.
- 5) Screen Resolution: Minimum resolution value for the program to run in the most optimized way: 1024x600.
- 6) Internet Connection: Minimum Cable or DSL Broadband.

10.3) Support Needs

- 1) IT Support: Handling all the technical assistance such as network, software and hardware problems.
- 2) Quality Assurance Support: Making sure that the equipment and software is qualified enough.
- 3) System support: Handling all the actions which are required authorized access such as adding or removing new users or backing up data.
- 4) Customer support: Listening to customers about their needs and wanting and keeping customer's satisfaction at the highest level.
- 5) Hardware support: Making sure that the best hardware is used and that there are no hardware issues.
- 6) Maintenance and stability support: Software must be sustainable and maintainable just in case.
- 7) Design support: The team should design the best software that meets the customer's needs.

11) Graphical User Interfaces

1) Homepage

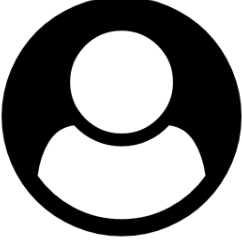


2) Login






A mobile application login screen. At the top, a status bar shows signal strength, battery level, and the time 14:35. Below the status bar is a large black circular icon representing a user profile. The title "USER LOGIN" is centered in a bold, black, sans-serif font. There are two input fields: the first is labeled "E-mail address or Username" and has a small user icon on the left; the second is labeled "Password" and has a lock icon on the left and an eye icon on the right to toggle visibility. Below the password field is a "Remember me" checkbox, which is checked, and a link labeled "Forgot Password?". A large blue button with the text "LOGIN" is centered below the form. At the bottom, there is a link that says "Dont have an account? [Create](#)".

14:35



USER LOGIN

 E-mail address or Username

 Password 

☒ Remember me [Forgot Password?](#)

LOGIN

Dont have an account? [Create](#)

3) Forgot Password

Login.' where 'Login.' is a blue hyperlink. The entire screen is framed by a thick black border representing the phone's bezel, with a small circle and a horizontal pill shape at the top and bottom center representing the camera and home indicator respectively."/>

14:35



Forgot your password?

Enter your e mail address and we'll send you a link to reset your password.

 E-mail address

Reset Your Password

Back to [Login.](#)

4) Create an Account




A mobile application interface for creating a new account. The screen is framed by a black border representing the phone's bezel. At the top, a status bar shows signal strength, battery level, and the time 14:35. Below the status bar is a large black icon of a person with a plus sign, and the text "SIGN UP" in bold, black, uppercase letters. There are four input fields, each with a grey background and a black border. The first field has an envelope icon and is labeled "E-mail address". The second field has a person icon and is labeled "Username". The third field has a person with a list icon and is labeled "Social Security Number". Below this field is a small question mark icon followed by the text "Why is this required ? Click [here](#).". The fourth field has a lock icon and is labeled "Password", with an eye icon on the right side to toggle visibility. Below the input fields is a large blue button with the text "Create Account" in bold, black, uppercase letters. At the bottom, there is a grey rectangular box containing the text: "By selecting Create Account, you agree to our [Terms](#) and have read and acknowledge our [Global Privacy Statement](#)".

14:35





SIGN UP

 E-mail address

 Username

 Social Security Number

? Why is this required ? Click [here](#).

 Password 

Create Account

By selecting Create Account, you agree to our [Terms](#) and have read and acknowledge our [Global Privacy Statement](#).

5) Choosing a post



6) Following a Post

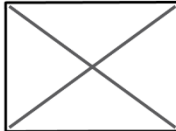


7) Create a Post

14:35

< Create a post

☐ Lost animal ☐ Street Animal

Upload a photo * 

Breed

Age of the animal

Phone number *

Address *

More details

Submit

8) Following Posts



12) Conclusion

In conclusion, our goal in developing this project is to save animals from their bad conditions and create a safe living space for them. We developed our project according to the software development plan. First, we determined the requirements of the project. After that, we decided that using the incremental model helps us to optimize our project plan. Then, we determined the tools we will use in the project. Next, we specified our measurements. Subsequently, we conducted a risk analysis for our project. Then, we analyzed stakeholders and defined the stakeholders that stands to benefit from our project or not. Afterwards, we determined the hardware, software and support needs of our project. Following that, we made a schedule for our project. Next, we made the graphical user interface (GUI) design of the project. Finally, we implemented the code of our project.

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