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Software Project Management

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CONTENTS

1 Problem Statement

In the existing criminal record system all the work is done manually, we can access the details in a particular record only after a tiring search of all the records in the police stations in a particular state, which is mostly performed manually and stored variably. This system needs more manpower to track the records of the crimes and criminals behind it. This adds to the workload of authorized persons. Managing all the records, updating and maintaining them as a consolidated document becomes a tough task and at times essential details could be missed out due to human error. Retrieving old criminal records consumes more time. In the existing system all work is done on papers so it is very tough to secure and maintain criminal report data.

Now-a-days all things are getting computerized except the criminal record management system. The smart criminal record tracker is a project which facilitates all kinds of information to the stakeholders (i.e jail superintendent, police, CBI, judge) about the criminal. it contains a shared and integrated database system in which it contains all the information of criminals all over the nation. Initially, the jail superintendent is the one who registers the information or data of the criminals into the database according to the crime performed by them, this information in the database will be permanently stored into the database which allows the stakeholders to access in future or whenever required. Then police and CBI can access the criminal information to solve the cases with easy search options like fingerprint matching, face matching, blood group matching and many more. This system really helps the police and CBI when they find any evidence in a crime scene or while investigating. Then after solving the case the complete investigating report is carried forward to the judge, then the judge's decision or the sentencing of the criminal is given which is again added back to the database by the judge. Therefore, the entire history of the criminal is maintained at the end, which finally helps the stakeholders for future references for solving criminal cases and background checks.

- Time consuming process, decision making process gets delayed.
- More manpower is required.
- Need for manual calculations.
- No direct role of the higher officials. Absence of a centralized database, which leads to loss of essential information.

• At present, there is no back up, data security and data maintenance activity.
• Tampering of criminal records is easy.
• Information sharing between the stations is a slow, tough and time-consuming process
• There is a possibility of losing the records.
• Information of criminals and common people are not properly maintained.
• Tracing a suspect is difficult.
• Fast report generation is not possible.
• Therefore, at the end due to the above limitations, solving of cases becomes delayed and inefficient which is the central activity of law enforcement agencies. To overcome these issues, we have designed a new system.

2 Feasability Study

A feasibility study may be a high-level capsule version of the whole System analysis and style Process. The study begins by classifying the problem definition. Feasibility is to determine whether it's worth doing or not. Once an acceptance problem definition has been generated then the analyst develops a logical model of the system. The search for alternatives is to be analyzed carefully. There are 5 parts in the feasibility study.

2.1 Legal Feasibility

This aspect ensures that whether any aspect of the proposed project conflicts with legal requirements like zoning laws, data protection acts or social media laws etc. It is important to ensure that the project is following the requirements needed to start a business or a project including business licenses, certificates, copyrights, business insurance, tax number, health and safety measures, etc.

For our Project :

For our project smart criminal record tracker there won't be any serious legal issues. since it's a government-based project. Moreover, we are maintaining the data integrity and data confidentiality using cryptography techniques, so that there won't be any way to hack the criminal's database.

2.2 Technical Feasibility

This involves questions like whether the technology needed for the system exists, how difficult it'll be to create, and whether the firm has enough experience using that technology. The assessment is predicated on outline design of system requirements in terms of input, processes, output, fields, programs and procedures. This can be qualified in terms of volume of knowledge, trends, frequency of updating in order to offer an introduction to the technical system.

For our Project :

This proposed system needs to maintain a huge number of records to keep track of the criminal information so to maintain that we need the latest efficient system with a high unique processor, 12GB RAM and best SQL server with high memory storage. This system is very reliable so it will compatible at any environment. This is technical feasibility. The technical feasibility assessment is concentrated on gaining an understanding of this technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and the way it meets the necessity of the proposed system. The current technical resources are sufficient to do this project. For the government there is an important need for this proposed system so that it makes them easier to retrieve the records of the criminals.

2.3 Economic Feasibility

The economic feasibility step of business development is that period during which a break-even financial model of the business venture is developed based on all costs associated with taking the product from idea to market and achieving sales sufficient to satisfy debt or investment requirements. It is the most frequently used method for evaluating the effectiveness of a new system.

For our Project :

Now-a-days everything is computerized except the records of the criminals. With this proposed system, It will avoid manual work and misplaced documents. It's also decreased the government budget to keep and maintain

the records of the criminals. Thus, the advantages of this project within the current scenario make it economically feasible. The purpose of the economic feasibility assessment is to work out the positive economic benefits to the government that the proposed system will provide.

2.4 Operational Feasibility

Operational feasibility is that the measure of how well a proposed system solves the issues, and takes advantage of the opportunities identified during scope definition and the way it satisfies the wants identified within the requirements analysis phase of system development. The operational feasibility assessment focuses on the degree to which the proposed development projects fits in with the prevailing business environment and objectives with reference to development schedule, delivery date, corporate culture and existing business processes. To ensure success, desired operational outcomes must be imparted during design and development. These include such design-dependent parameters as reliability, maintainability, supportability, usability, producibility, disposability, sustainability, affordability . These parameters are required to be considered at the first stages of design if desired operational behaviors are to be realized. A system design and development require appropriate and timely application of engineering and management efforts to satisfy the previously mentioned parameters. A system may serve its intended purpose most effectively when its technical and operating characteristics are engineered into the planning. Therefore, operational feasibility may be a critical aspect of systems engineering that must be an integral a part of the first design phases.

For our Project :

The interface of this project is designed in such a way that every stakeholder can easily retrieve all the details of the criminals across the nation. This makes the system reliable and efficient to use. Since it has a centralized database and contains a lot of records maintainability will be taken care carefully. Hence the operational feasibility becomes much better than the existing system.

2.5 Scheduling Feasibility

Scheduling feasibility analyses the time of the completion of projects. It measures how fast or how slow the project is being made for the proposed system. If there is a need to bring the project earlier in the market, this feasibility could play a major role by setting the deadlines for the project and comparing the work in the proposed system. The assessment of the project is very important in developing a project. The project may fail if it is not completed on time and also the end-users might face issues. The team has to complete the project in a given time so that perfection of project will be accurate. By doing this client will feel more satisfied by the work.

For our Project :

The estimated time to complete our project is 9-10 months as we need to gather all the criminal records from different places overall the country. More over this involves complex features like face recognition and fingerprints of all criminals. So it's a big challenging task to collect. Keeping in mind this will help judge officers and police officers to investigate the criminal according to their convenience. If the project takes longer than estimated, investors will have to bear extra costs.

3 STAKEHOLDERS

3.1 INTERNAL STAKEHOLDERS

- Admin
- Tester
- Developer
- Manager
- Requirement Analyst
- Owner/Client
- Designer
- System Architect
- End users
- Project Team

3.2 EXTERNAL STAKEHOLDERS

- Judge
- Criminals
- CBI Officers (Intelligence agencies)
- Jail superintendent
- Police Officers
- Visitors
- Non-Government/Private sector organizations
- Government
- Jailers
- Forensic departments

4 SUITABLE SOFTWARE DEVELOPMENT LIFE CYCLE MODEL

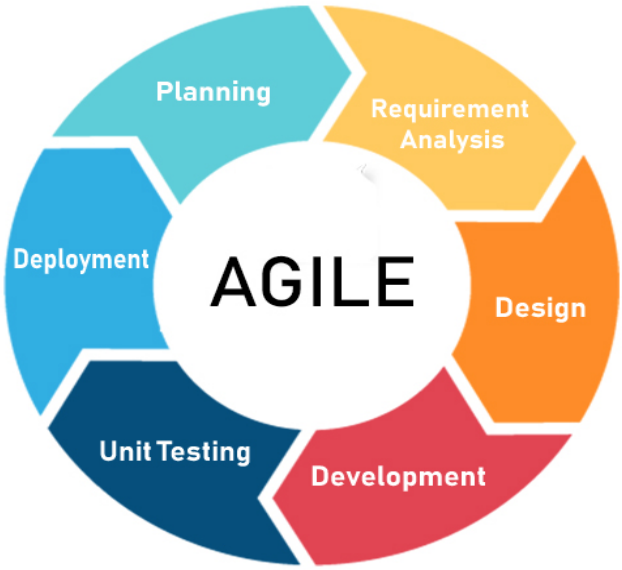
Agile SDLC model is a combination of iterative and incremental process models. We think this model is suitable as user requirements keep changing from time to time. More over Agile allows product owners to adjust requirements and priorities along the way to take advantage of opportunities and ultimately deliver a better product to all of the project stakeholders. The main motive to choose this model is to reduce the error as the modules gets tested thoroughly after each cycle.

As this a small project and requirements are defined early, there is no need to do large changes in project in future. And Agile allows for team check-ins, testing, feedback, and updates to be made before the project ends - without starting all over.

Now-a-days, each and every software tends to be updated again and again, keeping this point in mind Agile would work much better for our project. Another benefit of using this model is that this software can be developed in an incremental model module by module. Further the modules can be integrated one after another to create a newer version of the software. By doing this our software functions better and becomes more efficient to use.

As we are developing this project, the team doesn't have much experience

and even the project is new to the market we need to work on all the points, constraints etc. to give out the best output. So, finally keeping all the points above in mind Agile model is much suitable to give better and efficient output for our project.



5 STEPWISE PLANNING

STEP 0 Select project: Assigned project is SMART CRIMINAL RECORD TRACKER .

STEP 1.Identify project objectives

1.1 Identify objectives and measures of effectiveness :

• The main aim of this project is to create a portal where police departments, advocate departments and CBI officers can access the data of every criminal all-over the world.

• It contains a database of each and every crimes of the particular criminal.

• It also has a feature of updating the crimes data of criminals by police departments, advocate and CBI departments day-to-day.

• This portal gives you a customized feel for every department involved in crime by accessing the data of a every criminal anywhere at any time.

1.2 Establish a project authority:
The project manager Suresh is the project authority.

1.3 Identify all stakeholders in the project and their interests:
- Users
- Project team
- Admin

1.4 Modify objectives in the light of stakeholder analysis :
After stakeholder analysis, a new feature is added which shows the overall statistics of crimes committed by the prisoners and the statics of police, CBI and Advocate as well.

1.5 Establish methods of communication :
A separate group session will be provided for police, advocate and CBI departments to communicate among themselves on a particular case.So, it will help the case to solve the case easily of every criminal.

STEP 2. Identify project infrastructure

2.1 Identify relationship between the project and strategic planning :
Need of the project : This saves a lot of time and effort of each department by providing all the information of a particular criminal.

2.2 Identify installation standards and procedures :
This software is designed to be compatible which means it can used in any browser. It is user friendly and all the software standards will be followed while building this software .

2.3 Identify project team organization :
Project management roles :
Project Manager- Suresh.M
Front End -Sudheer.N
Analyst -Venkatesh.E
End Users - Criminal, CBI and advocate departments.

STEP 3 Analysis of project characteristics

3.1 Distinguish the project as either objective-driven or product driven :
It is an objective-driven project as the problem is stated but there could be more than one solution to solve this problem .

3.2 Analyse other project characteristics :
It is a well-defined Information system which protects the data of every criminal. Since the data can access only by the official officers of government. For each officer will be a separate login. In today's world every one concern mainly about the privacy so, we strictly maintaining the privacy of data.

3.3 Identify high level project risks :
The major problem in this project is the huge database which might cause performance risk because of which the project might fail to produce results for some time before maintenance.

3.4 Take into account user requirements concerning implementation :
All the user requirements including specifications details of every officers like Police, CBI and Advocate address all have been taken into consideration before implementing the project.

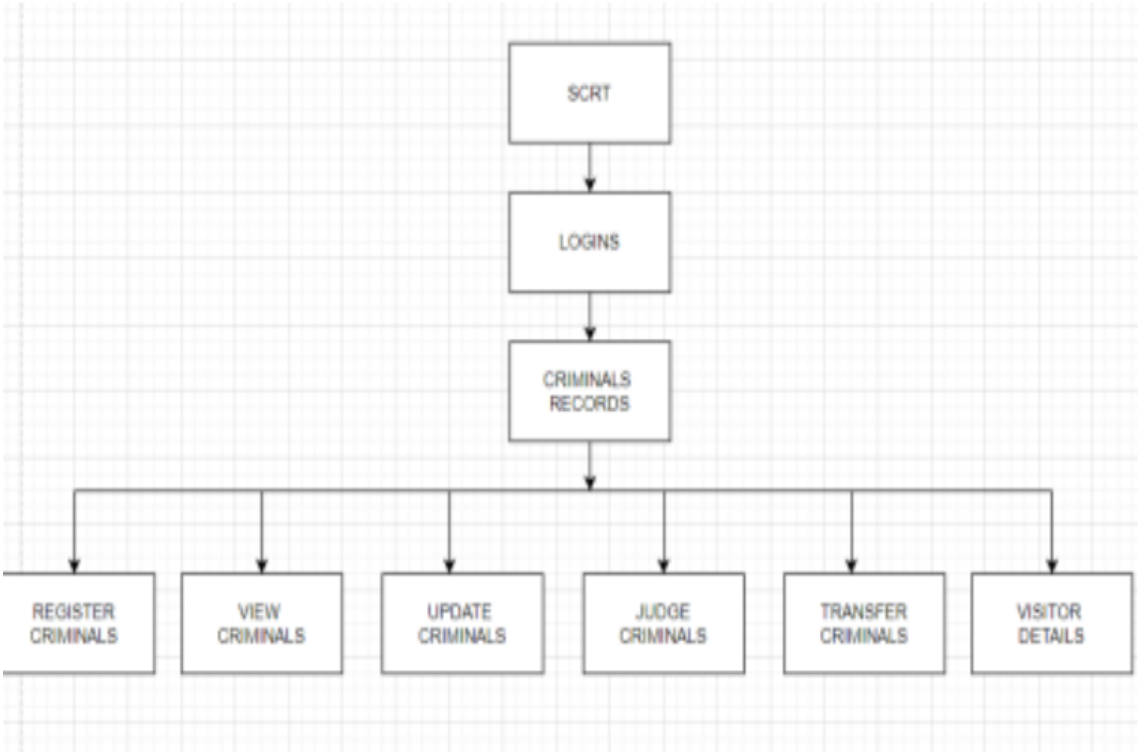
3.5 Select general life cycle approach in the light of the above :
Considering the fact that user requirements keep changing from time to time, we have chosen "Agile Model" as the development methodology. So iteratively we will incorporate any new features to be added in future updates.

3.6 Review overall resource estimates :
As of now we have identified major risks and overall approach so even after re estimating the required effort, the resources which are available are sufficient.

STEP 4 Identify products and activities

4.1 Identify and describe project products :
The relationship between products and the components is documented here in the form of product-breakdown structure.

4.2 Document generic product flows:



4.3 Recognize product instances :
There are 4 modules which in turn has many sub modules.

4.4.Produce ideal activity network :
The above flow diagram describes how the system works with activities and transformations.

4.5 Add check-points if needed :
Here, check points need to be added during the step of user verification and check compatibility of product of previous activities.

Step 5: Estimate Effort for Each Activity

5.1 Carry out bottom-up estimates :
Estimated effort: The effort needed is 4 members of staff who work for full time each.
Elapsed time: If 4 members start and finish the work together, it takes about 80 days to finish.

5.2 Revise plan to create controllable activities :
The complex activities such as gathering the crime activities of every crimi-

nal are broken down into sub-tasks to make the system feasible.

STEP 6: Identify Activity Risks

6.1 Identify and quantify the risks of each activity :
The co-ordination between members of project team is very crucial as there are limited members and any dropout results in high risk to collapse the modules if not properly planned.

S.NO	FEAUTURE	RISK
1	Less executive support	High
2	Communication gap among team members	High
3	Disputes between customer and project team	Low
4	Budget Estimation	Medium
5	Time Estimation	Medium
6	Scope ill Defined	Low
7	Political Issues	Medium

Step 7: Allocate resources

7.1 Identify and allocate resources to activities :
The project management team requires a web designer and a client along with the project manager. All of them work together to build the system right from requirements to design, implementation and testing.

7.2 Revise plans and estimates to take into account resource constraints :
In order to overcome this, there has to be alternative for important phases

so that in case one is not available the others will do the job.

Step 8: Review/publicize plan

Step 8.1 Review quality aspects of project plan :
To ensure each activity is complemented we review all the quality aspects of the plan where we also test if all the activities are functioning properly.

Step 8.2 Document plan and obtain agreement :
Proper documentation of each and everything is done to make it easily understandable and feasible for reuse.

Step 9 and 10 : Execute plan and create lower level plans Once the project is underway, plans need to be drawn in greater detail for each activity to consistently improve the user experience and quality of the product. As our approach is iterative, we constantly repeat all the activities and perform necessary changes which are our lower-level plans. As the time approaches for particular activities to be carried out they will be re-planned in more details. Then we start executing the plan.

6 RISK PLANNING AND CONTROL

Risk Planning is the process of identifying , prioritizing and managing risk . For every project we has objectives, goals that it seeks to accomplish. These are often called Critical Success Factors .

Risk events threaten the successful completion of these critical success factors. Thus, risk planning involves identifying the most important risk events in advance, prioritizing them, and developing the suitable risk response plans.

There are three steps to risk planning :
Identifying Risks.
Prioritizing Risks.
Determining Response Plans.

Identifying Risks :

A strong risk identification process is important to the successful completion of the important success factors. The risk register is the itemized listing of most important risks and it becomes the cornerstone of the Risk Manage-

ment Plan.

For our Project :

There could be the following risks which we may face in our project :

• Managing databases with real time data.
• Managing the database with a huge amount of data.
• Proper website server maintenance.
• Initially,Gaining profit is difficult when the project is launched .
• Initially criminal's data retrievers may face problems while accessing the data.
• Gathering the information of criminals from across the country is the toughest job.

Prioritizing Risks :

Identifying risks to a project's success is a great first step that would benefit most projects that we have seen. But to create a strong risk management plan, those risks must be analyzed and prioritized to determine which require the project manager's time and attention, how often, and what resources are required.

For our project :

From the above stated risk, we have prioritized risk on the basis of those which could affect our project much and which can solve by self .

• we have prioritized the risk into following :
• Managing databases with real time data.
• Managing the database with a huge amount of data.
• Proper website server maintenance.
• Gathering the information of criminals from across the country is the toughest job.

Determining Response Plans :

The final piece of information that completes the risk register is a risk response plan. Now that you've identified the triggers that allow you to quickly identify when a risk has occurred (or is occurring), the response plan gives you a head start in the response. Some responses occur at the beginning of the project and others occur when the risk event occurs. Still others occur at any applicable time during the project.

For our project :

• Managing databases with real time data and Managing the database with huge amounts of data.

Possible Solution :

Both the risk and problem states have pretty much similar solutions that are considering to have a huge database accordingly and also having good and heavy processors to manage more and more of real time data. Moreover, we can use a distributed database system which would also reduce the load on a single database which in turn increases the processing speed and finally give an amazing and in time experience to the customers.

• Proper website maintenance.

Possible Solution :

Project manager needs to assign more employees maintenance tasks and continuously monitor it. So, that we can maintain the server properly and give a good and happy experience for the customer.

• Gathering the information of criminals from across the country is the toughest job.

Possible Solution :

Far now all the criminals' data has been recorded manually. Since the data has been recorded by only superintendent police. So, with the help of a distributed database system, we can get rid of this problem.

How ?

Providing the login credentials initially to the superintendent police officers across the country.

Inserting the criminals' data by superintendent police of particular area all over the country.

7 CONTRACT BETWEEN ORGANIZATION AND CLIENT

Website Maintenance Contract

Client Name: _____ Phone Number: _____

Fax Number: _____ Street Address: _____

City: _____ State: _____ Zip: _____

Email: _____

Internet URL: _____ Contact: _____

Contract Term :

As per the terms of this agreement, [Service provider], [Business Address], Phone number:[ ] , Fax number:[ ] , and Contact email:[ ], agrees to provide the above client with regular website maintenance services for a period of [ ] month(s)/ or one year according to the terms below.

Purpose :

The Website Maintenance Agreement is for the sole purpose of enhancing the client's online visibility. Both parties agree the ongoing website maintenance will:

1.Improve the client's search engine rankings by enhancing site and page quality.

2.Allow the client to add enhancements to the website, such as product and keyword search.

3.Ensure the website is visible and working across the top ranking search engines, including [Google], [Yahoo], [Bing], and [Some other search engine].

General Terms :

1.Website owner agrees to provide the maintenance provider with all passwords necessary to access the website account.

2.Website owner agrees to provide access to databases, directories or proprietary software needed for the purpose of fulfilling the maintenance agreement.

3.Website owner agrees the maintenance provider has permission to make changes to the website, including adding or deleting information, as specified by the client.

4.The website owner agrees to provide the maintenance provider with desired changes in writing [ ] day(s) in advance of the desired publish date.

5.The website owner agrees to approve changes, additions, deletions within [ ] day(s) of being notified of the change(s) made by the service provider.

Service Provider Acknowledgements :

1.The service provider owns /has access to the software needed to make the updates, changes and general website maintenance as specified above.

2.The service provider agrees to keep all client information, such as passwords, confidential. The service provider will not share or release any client information to any third party, including hosting providers, without the written permission of the client.

3.The service provider agrees to seek clarification on client directions that are not clearly understood before making any changes to the website.

4.The service provider agrees to create a backup disk of the website before making changes and to use the disk to restore the website back to a previous version if requested by the client.

5.The service provider agrees to track time spent on the website and to send the client detailed time and productivity reports at the end of every month.

Maintenance Agreement Schedule :

Regular and ongoing website maintenance includes the following:

1.Check the website for all issues, such as broken links, invalid emails and page errors as well as fixing any errors found.

2.Complete [Weekly/Bi-weekly] updates, including adding or deleting website text and graphical content.

3.Create weekly website backup disks and provide the disks to the client on a [ ] basis.

4.Provide consultation services to the client as needed (counted against the hourly time allotment).

Compensation :

The client agrees to pay the service provider a set fee for website maintenance, regardless of whether or not maintenance is requested during a specific period.

The client agrees to pay the service provider dollar [ ] [week/month] for the website maintenance described in the contract above.

The set fee covers [ ] hours of work per week/ month.

The client agrees to pay the service provider a fee of dollar [ ] per hour for any maintenance not covered in the agreement above.

The client agrees to pay the service provider a fee of dollar [ ] per hour for creating/adding features or functionality, such as keyword optimization, not included in the agreement above.

By signing below, the parties agree to the terms of the contract.

Printed Name, Website Owner/Representative	Signature, Website Owner/Representative	Date
Printed Name, Service Provider	Signature, Service Provider	Date

8 Activity Network with estimated values

8.1 Expected Duration and Standard Deviation For Each Activity

- Calculate the expected duration and standard deviation for each activity .
- Identify the critical path .

The estimated values to predict the duration and standard deviation are :

TASK	OPTIMISTIC TIME(a)	MOST LIKELY TIME(m)	PESSIMISTIC(b)
A	3	6	15
B	2	5	14
C	6	12	30
D	2	5	8
E	3	9	26
F	3	6	15
G	5	11	17
H	4	19	28
I	1	4	7

To Find the Expected time and standard deviation for each activity we have formulas :

te = (a+4(m)+b)/6

s = (b-a)/6

After applying the assumed values in the formula, the expected time and standard deviation are:

TASK	t_e (EXPECTED TIME)	S(STANDARD DEVIATION)
A	7	2
B	6	2
C	14	4
D	5	1
E	11	4
F	7	2
G	11	2
H	18	4
I	4	1

8.2 Critical Path

Critical Path for our project is :

• Critical path is the minimum duration a project takes to finish. Any delay in the critical path leads to delay in the project. In a critical path, we do not have any float.

For our project :

smart criminal record tracker the estimated days for completing is given in the below table.

The activities are listed by giving a label to it :

ACTIVITY	PRECEDENTS	DURATION(DAYS)
Requirement analysis (A)	---	3
Design phase (B)	A	5
Build and functional Test phase - 1 (C)	B	7
Build and functional Test phase - 2 (D)	B	10
Integration Testing (E)	C,D	5
Alpha and Beta Testing(F)	E	4
Realse (G)	F	5

Activity network for our project :