Project Report
Essence Kernel

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Essence Kernel

Kernel is divided into three area of concern to cover the different aspects of Software Engineering:

1. Customer
2. Solution
3. Endeavour

Each area of concern contains a small number of:

1. **Alphas:** Representations of the essential things to work with. It provides the description of the things the team needs to manage or use.
2. **Activities:** Representation of the essential things to do. The Activity Spaces identify and list generic challenges a team faces when developing, maintaining and supporting software systems
3. **Competencies:** Representations of the key competencies required to do software engineering.

Now lets see what were the essence kernels used by us for making the project :

Alphas:

1. ***Opportunities****:* Nowadays we see that everything is being digitalised, so has our education system. Due to which there is a huge demand for ebooks. But we face a lot of trouble in finding these e-books, it consumes a lot of time, and sometimes downloading them also becomes a headache. So we want to make an online library from where we can access many of the books and download them with less effort.

2. ***Stakeholders****:* Following are some of the stakeholders in our project:
    1. **Developers**: We (Vipul and Raunak) developed the website and added the features. We have a direct interest in the project. We invested a lot of time in this project and the it's success will very much affect us.
    2. **Users:** Users are the key stakeholder, the website is designed according to their requirements. They want the website to be user friendly.
    3. **Person uploading books**: When a user requests a book, they try to find it from some online source and upload it to the website.

4. **Developer's friend**: They also have a direct impact. We took their advice regarding the skills needed to develop the website and how to approach.

3. ***Requirements:*** As a developer, we required at least 45 days of time. User's requirements were: Books should be downloadable, it can be searched by the name of book, there should be a feature to request for the unavailable books. Requirement of the person uploading books, is that the list of required books should be available on the main page

4. ***Software System:*** We have designed a website named "Digital Library". It fulfills most of the requirements and helps to address the opportunity stated above.

5.***Work:*** Finding the problem statement, Solution for the problems according to us, Taking other students feedback, Finalizing the needs, Developing the project,Testing of the project on local machine.
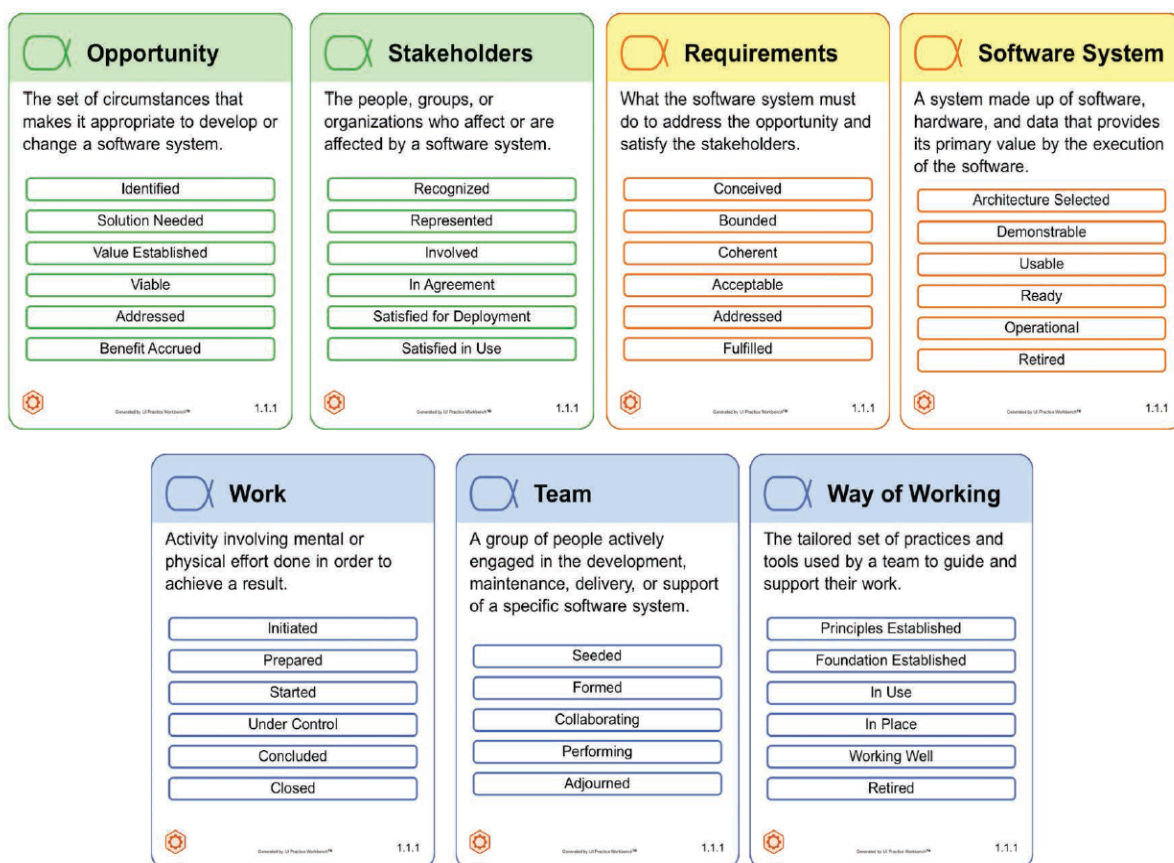
6.***Team:*** The team consists of 2 members Raunak Gandhi and Vipul Sharma.

7.***Way of working:*** We firstly found the problem that we as a student are investing a good amount of time on just finding the downloadable book we want. Then we find our solution for the problem using the

feedback of other students. Then the team members analysed the solution and finalised the requirements which our site will fulfill. Then we started writing code and developing the project in which we used to have a meeting almost every day and then we tested the whole website on our local machine.

All the above work was done with a lot of discussion within the team members and with some knowledgeable persons, who guided us in making our project.

The following cards shows the different states of the alphas:

Opportunity	Stakeholders	Requirements	Software System
The set of circumstances that makes it appropriate to develop or change a software system.	The people, groups, or organizations who affect or are affected by a software system.	What the software system must do to address the opportunity and satisfy the stakeholders.	A system made up of software, hardware, and data that provides its primary value by the execution of the software.
Identified	Recognized	Conceived	Architecture Selected
Solution Needed	Represented	Bounded	Demonstrable
Value Established	Involved	Coherent	Usable
Viable	In Agreement	Acceptable	Ready
Addressed	Satisfied for Deployment	Addressed	Operational
Benefit Accrued	Satisfied in Use	Fulfilled	Retired

Work	Team	Way of Working
Activity involving mental or physical effort done in order to achieve a result.	A group of people actively engaged in the development, maintenance, delivery, or support of a specific software system.	The tailored set of practices and tools used by a team to guide and support their work.
Initiated		Principles Established
Prepared	Seeded	Foundation Established
Started	Formed	In Use
Under Control	Collaborating	In Place
Concluded	Performing	Working Well
Closed	Adjourned	Retired

The following states were achieved by us while doing the project :

Alphas	States Achieved
Opportunity	Identified, Solution Needed, Value established, Viable, Addressed
Stakeholders	Recognized, Represented, Involved
Requirements	Conceived, Coherent, Bounded, Acceptable,Addressed
Software System	Architecture Selected, Demonstrable, Usable, Ready, Operational
Work	Initiated, Prepared, Started, Under Control,Concluded
Team	Seeded, Formed, Collaborating, Performing
Way of Working	Principles Established, Foundation Established,In use, Working well.

Now let's conclude the alphas for the project with an image about how essence alphas are related to each other.
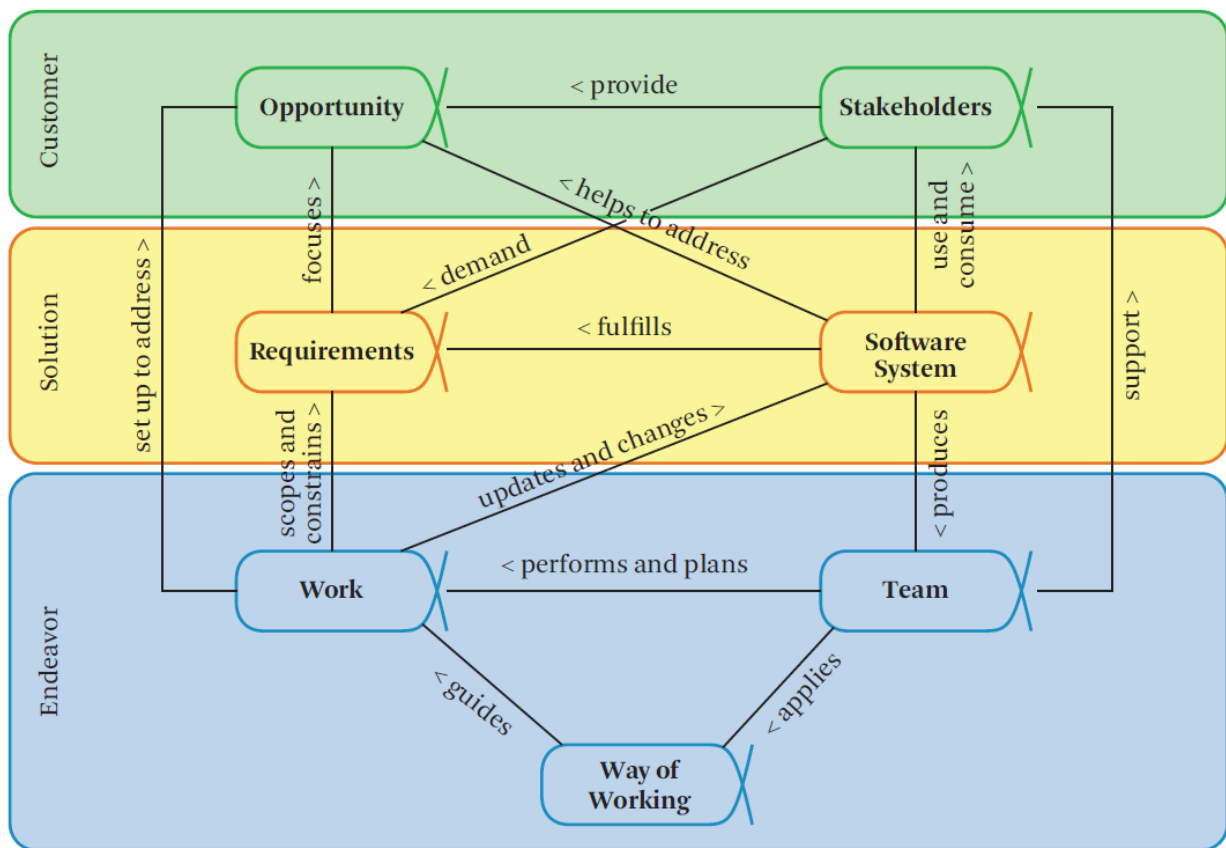
The above diagram is self explanatory about how all the alphas are related, like it shows stakeholders provide us the opportunity to build the project, Team applies a way of working which guides them to do the work , etc.

Activities:

1. ***Explore Possibility****:* Here we explored the different possible solutions and analysed the best solution and we also identified our stakeholders.
2. ***Understand Stakeholder Needs****:* We discussed with some of the students about the problem statement and got their views about what they want from the platform to achieve their goals .
3. ***Ensure Stakeholder Satisfaction****:* Once some part of the website was built we asked our friends to use that site(by giving them the code) and tell us whether they were satisfied or not by the above functionality and most of them gaved positive reviews.
4. ***Use the system****:* After using the system in our local machines we saw that it will help the shareholders like they will be able to search the books, request for it and will also be able to upload it. But it was not used by the users as we did not deployed it.
5. ***Understand the Requirement****:* After discussing alot with the team members we understood our final requirement and decided the final solution to the problem statement.
6. *__Shape the System__: After deciding the final solution we made the design for our website about how it will look and made some rough wireframes so that they can be used in the future for implementing the system.*
7. ***Implement the system****:* Once our website design is finalised we implement the system by writing the appropriate code so that our design can become functional, after doing the work on different modules we integrate them together to make the site fully functionable.

8. ***Test the system***: Then several tests were done by the team members as well as some of the other students to see if the functions were fulfilling the requirements of the stakeholder or not.
9. ***Deploy the system***: In our case we did not deploy the project as we wanted to add some more features in it but one can use it in their local machines if they have the code.
10. ***Operate the system***: As we did not deploy the system we did not experience how the system will behave in the live environment.
11. ***Prepare to do the work***: We created a team of 2 members as stated by our instructor and discussed how we are going to create this project and what model and practices we will follow.
12. ***Coordinate Activity***: In Spite of these difficult times of Corona we were able to coordinate through the online meetings and with other apps like Whatsapp. As the team consisted of only 2 members it helped us to coordinate well as we don't have to wait for anyone else to start the meeting.
13. ***Support the Team***: This was a major activity which we had to do during these difficult times as we not only supported each other for our project but also supported each other in their mental breakdowns. If one team member was sick the other one has to take a lead (in our case both the member had to take the lead some time as both felt sick sometime during the project)
14. ***Track Progress***: We tracked our progress every week by looking on what we have done this week and what we have to do in the coming weeks.
15. ***Stop the work***: We have not yet stopped the work as we want to add more features in it and then we will deploy it.

The following Figure describes the essence activity space in all the areas:
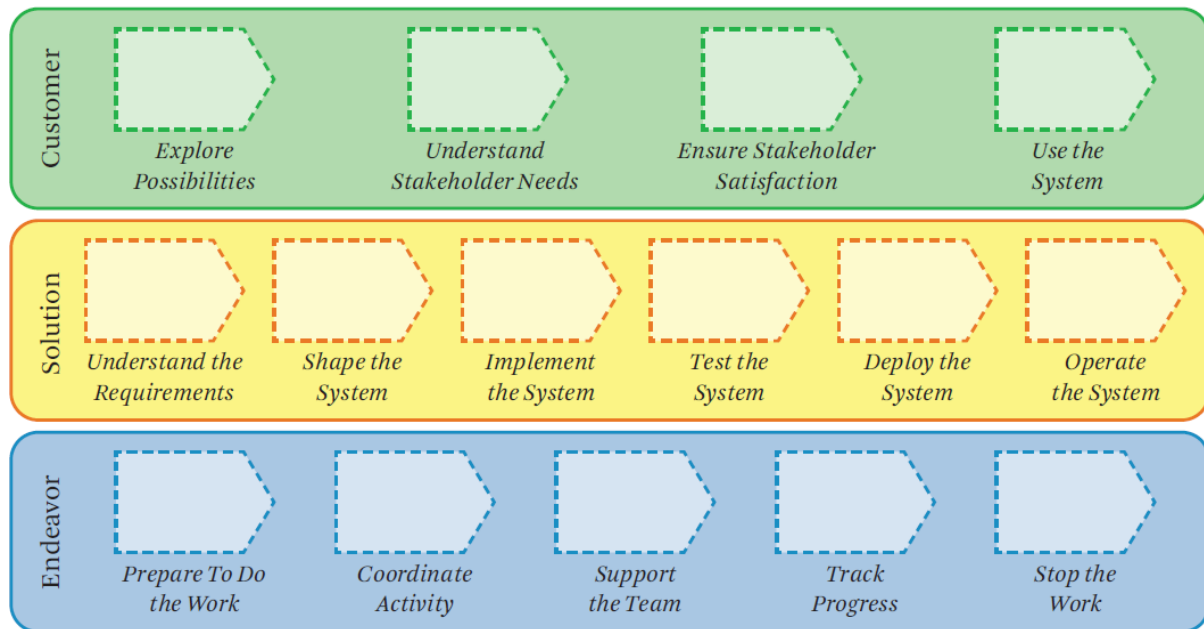

The activities followed by us in our project :

Area	Activities done
Customer	Explore Possibilities , Understand Stakeholders Need , Ensure Stakeholder Satisfaction.
Solution	Understand the Requirements , Shape the System , Implement the System , Test the System.
Endeavor	Prepare to do the work , Coordinate Activity , Support the Team , Track Progress.

Competencies :

1. ***Stakeholder Representation****:* Both the team members gathered , communicated and balanced the needs of other stakeholders and represented their views.
2. ***Analysis****:* Both of us discussed the opportunity and found out the best solution we could .As there were less no. of stakeholders present in our project it was easy for us to get agreed upon the same things.
3. ***Development****:* Both of us developed the project equally as all the functionalities were divided among us and we implemented those functionalities and then integrated them to make the final project workable.
4. ***Testing****:* Both of us tested the project and found if there were any bugs and then debugged it to increase the quality of the final project .
5. ***Leadership****:* As mentioned earlier that in the time of corona we both felt sick sometimes during the project so the other person had to take the lead and the responsibilities.
6. ***Management****:* Both of us coordinated throughout the project with the help of various online meetings in which we discussed what things have been completed and what are left , and as we were only 2 members most of the time so it was easy for us to communicate.
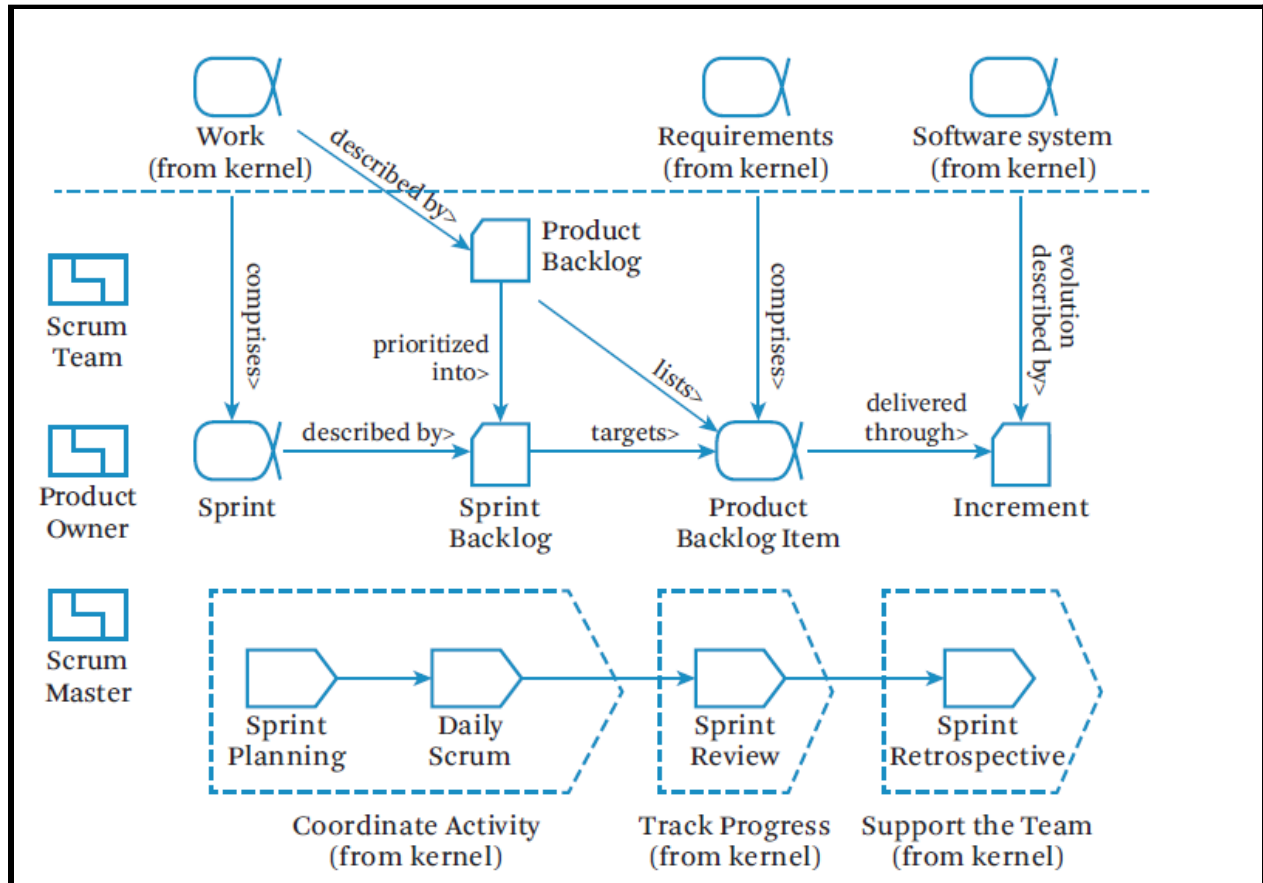
The following Figure describes the essence competencies in all the areas:
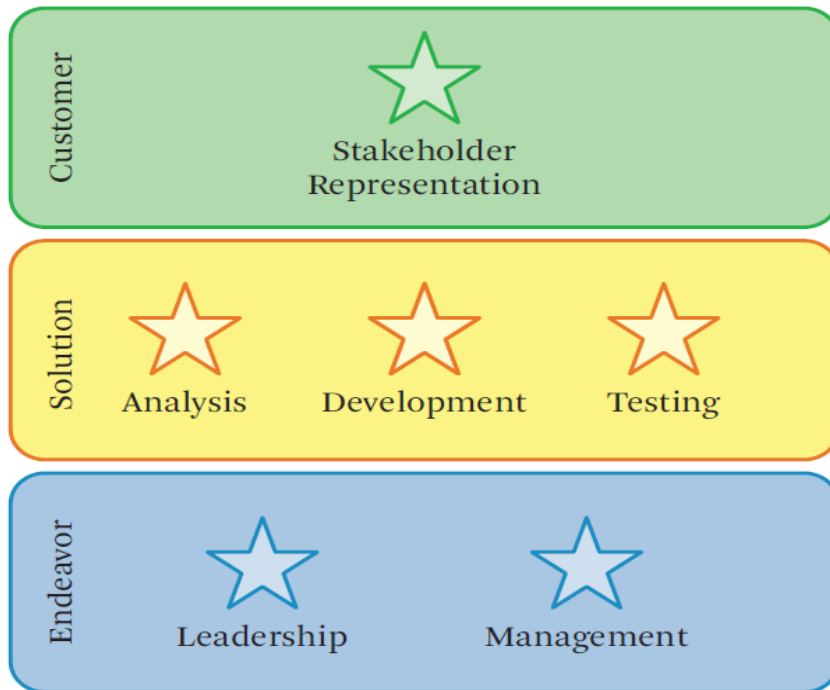
The competencies followed by us :

Area	Activities done
Customer	Stakeholder Representation
Solution	Analysis , Development , Testing
Endeavor	Leadership , Management

Scrum Lite Practices :

The above picture shows the Scrum Lite Practices in Essence Language.

Lets see how we followed the scrum lite Practices in our Project :

- We had a Scrum Team of two members Raunak and Vipul.

- In the Product Backlog list we mentioned all the work we had to do like building a login page , see how we can upload and

download books on the server and all the work that has to be done.

● Then comes the heart of scrum i.e. Sprint , in our case the length of the sprint was about 7-10 days firstly we do a sprint planning in which we decided what work we have to do from the Product Backlog list in the particular sprint and add those work to the Sprint Backlog and we decided how we will achieve the sprint goal within the given time. Like when we decided we will make login in this sprint then we decided how we will make it, what styles we will use and other information about logins.

● Now during the sprint we discussed every day what we have done today and synchronised our work , planned what we will do in the next 24 hours and also discussed what problems we are facing in doing the task . These daily short meetings are known as daily scrum in the Scrum practices.Like when we were making login so their will be two part of it login page and a register page both the members tooked a page and now for making it we first learned on the first day about some basics of styling the forms and in the meeting we exchanged the resources we used now on next day we will finalise our design and then in the further days implement it .

- At the end of the sprint ,a meeting was done with the stakeholders to review the product in the current version of the product which is known as product shippable increment in the scrum and they can also include some product improvements which will be added to the PBI list. For our project our login was made first and when the stakeholders reviewed they said that the password must be at least 8 characters so we had to add it in the product backlog list.

- At the end of each sprint we hold a sprint retrospective activity in which we agree to the improvement in the way of working to be koimplemented in the next sprint.In each sprint we improved our way of working which helped us in making a good quality project.

  Note : We can compare the above model with the agile model which we had discussed in our SRS document

Use Cases:

These are the use cases provided by our projects:

- **Log-in:** The user can log in to the website to use the other functionalities of the website.

- **Search bar:** The user can search for different types of books by just mentioning the name of the book.

- **Comments:** Users can give their reviews about the book.

- **Request Book:** Users can also mention the books they need on the Request Book Page.

- **Required Books**: The requested book by a User will be added to this page.

- **Upload**: Users can upload the book that is shown on the Required books page and any other quality books also.

- **Download:** The most important use case is in the end, users will need to download the book they want to read.

The following self explanatory diagram makes us understand the use cases :