B19CSE045
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CSL2060 Software Engineering
Document on the essence kernel and additional practices
Topic : Group Assignment from Software Engineering Course (B19CSE045 & B19CSE039)

- **A kernel is used for describing a software endeavour.**
- **Kernels are defined with the help of a set of languages.**
- **Together, they make up the essence.**

Essence Kernel can be divided into 3 types.They are:

1. **Customer**
2. **Solution**
3. **Endeavour**

1.Customer:

In the customer area , the Kernel alphas have to be divided into opportunity ,and stakeholders.

The customer phase has to be more concerned with exploring the possibilities , understanding the stakeholder's needs, making sure that the stakeholders are satisfied and using the system.

Opportunity :

- This describes the set of circumstances which makes it appropriate to develop or change a software system.
- It represents the team's shared understanding of the stakeholders' needs, and helps shape the requirements for the new software system by providing justification for its development.
- It shows the team's understanding of the needs of the stakeholder and helps in the betterment with appropriate justification.

Stakeholders:

- The group of people who are affected by the software is known as stakeholders.
- This includes the people who developed the software and also the people who are using it.
- Stakeholders are the people who take part in the development , deployment , build , test and design phases.
- It is these stakeholders who need to ensure that these requirements are fulfilled.

2.Solution:

This part covers the development of the software system through producing a software system that is specific and is part of the solution to the problem.

The alphas are:

- Requirements
- Software System

Requirements:

What are the required steps that the software system has to do to satisfy the stakeholders and the members of the team which should be used to drive the development and testing of the new system.

The following are the states of requirement:

Conceived:

Need Of new system is agreed.

Bounded:

The purpose and Its extent are clear.

Coherent:

The essential requirements are listed down for the new system.

Acceptable:

A system is described such that it is acceptable in the stakeholder point of view.

We need requirements because it is able to figure out what is needed by the stakeholders.

Software System:

A system made up of software , hardware and data which returns a value from the execution of the software is called a software system.

The following are the states of requirement:

Architecture Selected;

An architecture is selected that addresses the key risks and constraints.

Demonstrable:

A system that proves that the architecture fits in and supports testing.

Ready:

The software is ready for deployment in a live environment.

Operational:

A system is described such that it is acceptable in the stakeholder point of view.

Retired:

The system is not supported anymore.

3.Endeavor :

This part mainly targets the team's performance and the way they approach a solution to a problem.

Depending upon the time taken to finish a software project, this will affect the stakeholders.Hence, a set of plans , practices and leaders to monitor the team is necessary.

The alphas :

- Team
- Work
- Way of Working

Team:

This refers to a group of people who are engaged in the activities such as supporting the software through development , design ,etc.

We need a team since software engineering is mostly a team collaboration work which cannot be handled by a single person.

The following are the states of team :

Seeded:

The team's target is made clear and the question 'how' is planned.

Formed:

The members of the team are chosen and prepared to start.

Collaborating;

Team members are working together as a set of people.

Performing:

The team performs with efficiency and effectiveness.

Adjourned:

The end of the team where it's no longer responsible for the target.

Work:

The physical and mental efforts that are put together to achieve the target is called work.From the software engineering point of view , work is everything that is needed to achieve the target.

The states associated with work are:

Initiated :

Work is requested.

Prepared :

All the prerequisites are met to start the work

Started:

The work has started and is in progress.

Under Control:

The work is going good and is under control with minimal risks.

Concluded:

The work needed to achieve the goal is concluded.

Closed:

All the tasks have been cleaned up and the work is closed officially.

Way of Working:

The set of practices,tools and ethics a team follows to reach the goal through their work is called way of working.

The better the team understands the goal the better the way of working is going to be.Therefore, as the team is continuously working, the way of working improves eventually and the team adapts to the situations.

The following are the states of Way of working:

Principles Established:

The way of working is established

Foundation Established:

The foundation and the important practices are chosen for the way of working.

In Use:

Some part of the team is under Adaptation to the way of working and using it.

In Place:

All the members used the way of working to reach the goal.

Working Well:

The team is performing good with minimal risks.

Retired:

The way of working is no longer in use.

Way of working is the key to establish work together.

The following above activity spaces were followed in the project to reach the target.

Essense Practices used:

Essence is a practice that is used to define the method and practices used among software engineering.

Among the 4 types of common practices(ie scrum , user stories , use cases and microservices), we have chosen scrum as our mode of practice.

Reason:

Scrum is a project framework that is highly compatible with close deadlines , and it works off a product backlog and the scrum team could be of 2 members which can still allow a scrum master.

The common terms that we followed in scrum would be:

Scrum Team:

- This usually consists of 5-9 members and is also capable of having 1-2 members or upto 100 members.
- Within a sprint, everyone in the project has to work together to finish a set of tasks.

Product Owner:

- The project's key stakeholder is the product owner.
- It also represents the users and customers.

Scrum Master:

- The scrum master is the one who is responsible to ensure that the team is as productive as possible.

Product Backlog:

- The product backlog is a list of changes that has to be made in a prioritized order to change the product in the desired manner.
- Basically, it's a list of desired items for the product.
- Sprint backlog , on the other hand refers to the list that has to be completed in a sprint.

Sprint Planning Meeting :

- At the start of each sprint, a Sprint Planning Meeting is conducted to remind the top item from the product backlog to the team.
- The scrum team then chooses the list of items they can finish before the sprint.
- The chosen items are moved from product backlog to sprint backlog which needs to be finished before the sprint.

Daily Scrum:

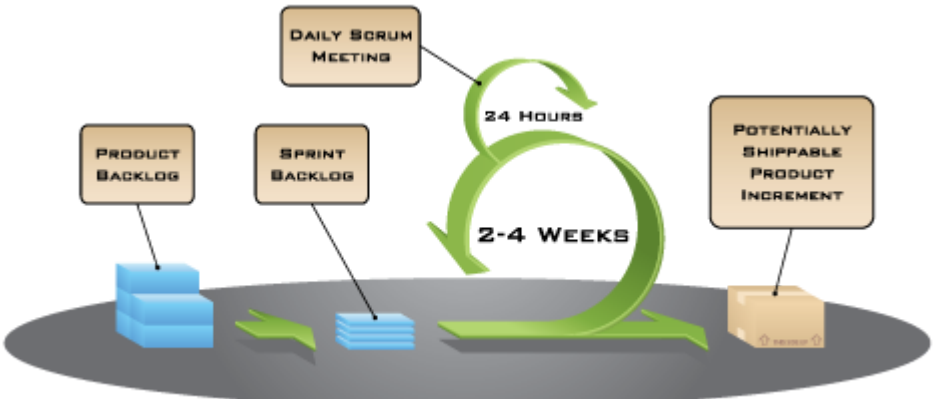
- Everyday during the sprint, a small meeting is held to set the current day's work context which will greatly help to keep the team on track.

Sprint Review Meeting:

- This occurs at the end of each sprint.
- The team demonstrates the completed functionality where they show the tasks finished in that current sprint.

Sprint Retrospective:

- This too occurs at the end of each sprint where the team discusses how well the scrum is carried out and what are the changes that could be implemented to make the project better than before.



Above is an example image of how scrum works in a project.

We have implemented scrum in our software engineering project in the following ways:

NOTE:

We considered a sprint to be 1 week long and daily scrums were conducted at 12:01am everyday.

Scrum Team:

- The scrum members of our team would be of only 2 people.
- M K Laksath Adityan (B19CSE045)
- Himanchal Sharma (B19CSE039)

Product Owner:

- The project's key stakeholder is the product owner.
- It also represents the users and customers.
- The users of our mobile application could be anywhere in the world who has an android mobile with internet connectivity.
- The Product owners would be:
- M K Laksath Adityan (B19CSE045)
- Himanchal Sharma (B19CSE039)

Scrum Master:

- M K Laksath Adityan (B19CSE045) is the scrum master.
- There would be a google meet setup everyday to make sure everything goes in place without risks and mistakes.

Product Backlog:

- We decided the major list of product backlog at the start of the project and continued adding several other backlogs as the scrum started to progress to make it a better version.

Sprint Planning Meeting :

- As a new sprint begins, we would look at what is more important (i.e. top of the list in the product backlogs) and choose the tasks appropriately.
- Then , those items would be taken away from the product backlogs and shifted to sprint backlogs.

Daily Scrum:

- We would set up google meet links at 12:10 am everyday after submitting the assignments of the other subjects to discuss the work that has to be completed on that day.

Sprint Review Meeting:

- At the end of a sprint , we would ensure that the given sprint backlog was completed.If not, that would be an add-on for the next week.
- We ensured that there would be no bugs while working on a particular part during a sprint.

Sprint Retrospective:

- This too occurs at the end of each sprint where we discuss how well the scrum is carried out and what are the changes that could be implemented to make the project better than before.
- We discussed if anymore product backlogs are to be added or not.
- We also discussed if there are any bugs/ errors we would go about fixing them.

NOTE:

Sprint review meetings and sprint retrospective meetings were usually conducted on Monday 12:10 am of the week.

Our mobile Application was made through a lot of discussions ,backlogs and sprints.

Some parts of scrums were:

- The type of design that we had to implement on a particular section (Eg: In reminders section /expenses section) were implemented in some sprints.
- The backend bugs that we faced were added on to the next sprint as a sprint backlog too including the upcoming sprint backlog.

- After each sprint is over, we run it on our emulators to check for bugs and make sure it works clean.If not, we try fixing it up then and there else, we add it to the next sprint backlog.
- Before we begin a sprint, we would discuss the most important backlogs that have to be finished in the current sprint so that the following sprints wouldn't be having any issues.
- After a sprint is over, we look at the current state of the project and ask ourselves if it could be improved.If yes, then we add it to the product backlog based on the new need's priority.

Additional Practices (SDLC MODEL):

- For the software engineering project, we have decided to go with the Prototype Model.
- Here we start by defining the purpose , identifying the needs and gathering them.
- Then , a quick design of the model is created.
- This will be focused on the requirements of the user which then leads to creation of a prototype.
- Then , it is checked through the customer for any changes and modifications that are needed.
- Upon following the above steps in several loops, the prototype improves itself in the meantime to make better versions of it.
- The process is continued until there is satisfaction with the customers.
- Once this is done, the prototype is converted to the actual system.

- Here, the "customers" described above were a few of our classmates and friends from the college, where we would send out the apk and they would review if it's better or not.
- Finally , we would decide whether to make changes or not according to that.
- We made a prototype model at the beginning which was poorly designed with bad functionality.
- We would get customer review after releasing each prototype week after week.
- All the parts (Expense , Diary and Reminders) were getting improved after every prototype.
- When the customers were satisfied and when we were satisfied that the product is good enough, we finally decided to stop and convert the final prototype , the most advanced and updated one to the final apk.
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