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ACTIVITY - 1

1) study the traffic signal and the importance of rules and process.

Ans:- Traffic signals play a crucial role in regulating the flow of vehicles and ensuring safety on the roads. They are designed to manage intersections and guide drivers, pedestrians, and cyclists effectively.

Here's an overview of their importance:-

1) Safety:- Traffic signals help prevent accidents by controlling the move ment of vehicles, pedestrains, and cyclists at intersection. Clear signals reduce confusion and the likelihood of collisions.

2) Efficiency:- By coordinating the flow of traffic, signals optimize the use of road space and minimize congestion.

3) Priority:- Signals provide priority to different streams of traffic based on demand and traffic patterns. They allocate green time to the busiest directions, ensuring smoother movement for all road users.

4) Pedestrian safety:- Traffic signals include crosswalk signals and pedestrian phases to ensure the safety of pedestrians crossing intersections. Pedestrian signals indicate when it's safe to cross and when to wait, reducing the risk of accidents involving pedestrians.

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Importance of traffic rules and processes:

1) orderly Movement: Traffic rules provide a framework for orderly movement on roads, highways, and streets. They establish norms for interactions between different road users, such as drivers, pedestrians, cyclists, and public transportation.
2) Predictability:- Consistent adherence to traffic rules makes road behavior more predictable for all users. When everyone follows the same set of rules, it reduces the likelihood of misunderstandings, conflicts, and accidents.
3) Safety:- Traffic rules are primarily designed to enhance safety on the roads.
4) Environmental Impact:- Adherence to traffic rules can also have positive environmental impacts. Measures like carpool lanes, emission standards, and restrictions on vehicle idling contribute to reducing air pollution and mitigating the environmental impact of transportation.
5) Public Health:- Compliance with traffic rules contributes to public health by reducing the number and severity of road accidents. Fewer accidents mean fewer injuries and fatalities, leading to improved overall well-being in communities.

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ACTIVITY - 2

1) Visit various consulting company web portals and collect case studies.

Ans :- 1) Google Search :- Use specific keywords like "consulting company case studies" or "consulting firm client success stories" to find relevant pages.

2) Consulting Company Websites :- Many consulting firms have dedicated sections for case studies or client success stories on their websites. Look for sections like "Our Work," "Case studies," or "Client stories."

3) LinkedIn : Some consulting firms share case studies or client success stories on their LinkedIn company pages or in articles/posts.

4) Industry Publications :- Look for industry publications or journals that may feature case studies from consulting firms.

5) Business Databases :- Explore business databases like Harvard Business Review, McKinsey Insights, or Deloitte insights for case studies and thought leadership pieces.

6) Browse Case Study Sections:- explore the case study sections of these websites to find detailed examples of consulting projects, client success stories, and the solutions provided.

7) Read and Analyze:- Read through the case studies to understand the challenges faced by clients, the strategies implemented by the consulting firms, and the outcomes achieved.

8) Compile Information: compile the information from multiple case studies into a document or spreadsheet. Organise the case studies by industry, type of project, or business challenge addressed.

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ACTIVITY - 3

① Document the roles and responsibilities of different agile ceremonies.

Ans:- Agile ceremonies:-

* Sprint Planning:- is used to determine ~~that~~ what the team will accomplish in the upcoming Sprint. The event itself has two parts. The first half of Sprint Planning is used to determine 'what' the team will be working on, by pulling items from their Backlog into their Sprint Backlog.

* Daily Scrum:- The Daily Scrum, sometimes referred to as the Daily standup, has a time-box for 15 minutes or less, and is specifically for the benefit of the development team.

* Sprint Review:- The Sprint Review is when the team presents their work from the Sprint to the project's stakeholders. It should cover not only the work they accomplished, but also open discussions around the work they were not able to complete.

* Sprint Retrospective:- The Sprint Retrospective is the primary event in which the Scrum Team can inspect and adapt their approaches based on their experiences from the previous sprints.

Roles and Responsibilities of Agile:-

* Product Owner:- often an executive or key stakeholder. the product owner has a vision for the end product and a sense of how it will fit into the company's long-term goals. This person will need to direct communication efforts, alerting

team to major developments and stepping in to course-correct and implement high-level changes as necessary.

* Scrum Master:- The Scrum Master is most akin to a project manager. They are guardians of process, givers of feedback, and mentors to junior team members. They oversee day-to-day functions, maintain the Scrum board, check in with team members, and make sure tasks are being completed on target.

* Team Member:- Team members are the makers: front- and back-end engineers, copywriters, designers, videographers, you name it. Team members have varied roles and skills but all are responsible for getting stuff done on time and in excellent quality.

ACTIVITY - 4

① Identify Commonly used risk management tools:

Ans: 1) Risk Registers: Similar to those used in general risk management, but tailored to software development projects, listing software.

2) Failure Mode and Effects Analysis: Assessing potential failure modes and their impacts on software systems.

3) Fault Tree Analysis (FTA): Identifying potential system failures and their causes through a tree-like diagram.

4) Risk-Based Testing: Prioritizing testing efforts based on identified risks to focus on high-risk areas.

5) Dependancy Analysis: Identifying dependencies within the software and assessing the impact of changes or failures.

6) Code Review: Reviewing code to identify potential risks such as security vulnerabilities, performance issues, or coding errors.

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7) Automated Testing Tools:- Utilizing tools for automated testing, including unit tests, integration tests, and regression tests to mitigate risks associated with software defects.

8) Version Control Systems:- Managing changes the software codebase to minimize the risk of errors and conflicts.

9) Security Scanning Tools:- Identifying and mitigating security risks such as vulnerabilities, malware, or unauthorized access.

10) Agile Risk Management Techniques:- In Corporating risk management practices within agile methodologies, such as risk-based backlog prioritization and iterative risk assessments.

11) Risk Heat Maps:- Visual representations of risks categorized by severity and likelihood.

12) Control Charts:- Monitor process performance over time to detect and mitigate potential risks.

13) Scenario planning:- Considers various future scenarios and their potential impacts on the organization.

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ACTIVITY - 5

Identify a problem and explain how design thinking can be applied to solve it.

Ans: Some additional information on each step of the design thinking process applied to solving the problem of reducing food waste in restaurants:

1) Empathize :- This step involves immersing yourself in the experiences of stakeholders to understand their needs, motivations, and pain points regarding food waste. Conducting interviews, surveys, and observations can help uncover valuable insights. For example, talking to chefs might reveal challenges in predicting customer demand, while speaking with customers might uncover concerns about portion sizes or food quality.

2) Define :- Once you've gathered insights, it's important to Define the problem statement clearly. This involves synthesizing the information collected during the empathize phase to identify the key issues contributing to food waste in restaurants. For instance, the problem might be defined as "excessive food waste due to inaccurate demand forecasting and portion sizes".

3) Ideate :- In this phase, brainstorming sessions are conducted to generate a wide range of potential solutions to the defined problem. Encourage creative thinking and explore both conventional and unconventional ideas. For example, idea might include implementing dynamic pricing to

incentivize customers to order more accurately, or creating a surplus food redistribution program to donate excess food to local shelters.

4) Prototype: Prototyping involves creating small-scale, low-cost versions of the most promising ideas generated during the ideation phase. These prototypes can take various forms, such as pilot a menu optimization strategy by offering smaller portion sizes or introducing a "chef's special" made from surplus ingredients.

5) Test :- During the testing phase, prototypes are implemented in real-world settings to evaluate their effectiveness and gather feedback from stakeholders. The feedback helps identify what works well and what needs improvement. For example, a restaurant could test a food donation program by partnering with a local charity to redistribute surplus food and gather feedback from both staff and recipients.

6) Iterate :- Based on the insights gained from testing, iterate on the prototypes to refine and improve them. This might involve making adjustment to the prototypes based on feedback or combining elements of different prototypes to create a more effective solution. Continuously iterating allows for incremental improvements and increases the likelihood of developing a successful solution.

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ACTIVITY - 6

List the criteria to select the requirement management tools.

Ans:- Selecting the right requirement management tools depends on various factors. Here are some criteria to consider:

1) Functionality:- Ensure the tool provides features like requirement capture, traceability, version control, collaboration, and reporting.

2) Ease of Use:- User-friendly interface and intuitive navigation are crucial for adoption across teams.

3) Integration:- Compatibility with other tools in your development ecosystem such as project management, testing, and version control systems.

4) Customization:- Ability to tailor the tool to fit your organization's specific processes and terminology.

5) Scalability:- Ensure the tool can accommodate your current needs and scale as your project or organization grows.

6) Security:- Robust security measures to protect sensitive project information and comply with relevant regulations.

7) Cost:- Consider upfront costs, licensing fees, ongoing maintenance, and potential scalability costs.

8) Support and Documentation:- Access to responsive customer support, comprehensive documentation, and a user community for assistance and learning

9) Accessibility :- Availability across platforms (desktop, web, mobile) to facilitate collaboration and access from various locations.

10) Performance :- Reliability and speed, especially when dealing with large projects or database.

11) Feedback and Reviews :- Gather insights from reviews, testimonials, and recommendations from other users or industry experts.

12) Vendor Reputation :- Assess the reputation, track record, and longevity of the tool's vendor in the market.

13) Regulatory Compliance :- Ensure the tools supports compliance with relevant standards and regulations in your industry, such as ISO, FDA, or GDPR.

14) Future Roadmap :- Evaluate the vendor's commitment to ongoing development and updates to meet evolving industry needs and technological advancements.

15) Compliance Requirements :- If your project is subject to specific regulatory or industry standards, verify that the tool supports compliance requirements and provides features to facilitate compliance documentation and reporting.

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ACTIVITY - 7

Explore agile estimation techniques and prepare a report.

Ans:- Agile estimation techniques play a crucial role in agile project management methodologies by providing teams with the means to forecast project timelines, allocate resources efficiently, and prioritize tasks effectively.

Agile Estimation Techniques:-

1) Planning poker:- Planning Poker, also known as Scrum Poker, is a consensus based technique used to estimate the relative size of user stories or tasks. Team members assign story points or effort units to each item by discussing and comparing them against a reference story.

2) Relative Estimation: Relative estimation involves comparing the size or complexity of one user story or task to another. This approach simplifies estimation by focusing on relative differences rather than precise measurements.

3) Three-Point Estimation:- Three-Point estimation combines optimistic, pessimistic, and most likely estimates to calculate an expected value for a task or user story. Team members provide estimates for the best-case scenario (optimistic), worst-case scenario (pessimistic), and the most likely scenario. These estimates are then averaged or combined using weighted formulas to derive a more accurate estimate, considering both uncertainty and variability.

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Advantages of Agile Estimation Techniques:-

* Flexibility:- Agile estimation techniques accommo-date uncertainty and change, allowing teams to adjust estimates as new information emerges or project requirements evolve.
* Collaboration:- These techniques promote collaboration and consensus building among team members, fostering a shared understanding of project scope and priorities.
* Efficiency:- Agile estimation enables teams to prioritize work efficiently, allocate resources effectively, and streamline project planning and execution.
* Transparency:- By making the estimation process visible and inclusive, agile techniques enhance transparency and accountability, empowering stakeho-ders to make informed decisions.

Challenges and Best Practices:-

* Uncertainty:- Agile estimation techniques rely on assumptions and approximations, making them susceptible to uncertainty and variability. Teams should embrace uncertainty and focus on refining estimates iteratively as they gather more information.
* Bias:- Individual biases and cognitive influences can impact estimation accuracy. To mitigate bias, teams should foster open communication, encourage diverse perspectives, and leverage techniques like Planning Poker to ensure balanced inputs.

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ACTIVITY - 8

study boiler plate and present necessary characteristics of boiler plate for a large and small project

Here are the necessary characteristics for boilerplate code in both large and small projects:

For Large projects:-

1) Modularity: Boiler plate code should be modular allowing developers to easily plug in or remove components as needed.
2) Scalability: It should scale with the size and complexity of the project, providing a solid foundation for growth.
3) Customization: Despite being standardized, boilerplate code should allow for customization to adapt to specific project requirement.
4) Documentation: Comprehensive documentation is crucial for large projects, helping developers understand how to use and extend the boiler-plate effectively.
5) Testing Support: Boilerplate code should include support for testing frameworks to ensure code quality and reliability at scale.
6) Version control Integration: Integration with version control systems like Git for managing changes and collaboration among developers.
7) Error Handling: Robust error handling mechanisms to maintain stability and resilience, especially in large-scale applications.

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For Small Projects:-

1) Simplicity:- Boilerplate code should be simple and easy to understand, without unnecessary complexity or overhead.
2) Speed of setup:- Quick setup and deployment are essential for small projects, allowing developers to start working on the actual functionality sooner.
3) minimal Dependencies:- Limited dependencies to keep the project lightweight and reduce potential conflicts or compatibility issues.
4) Flexibility:- Even in smaller projects, boilerplate code should offer some degree of flexibility to accommodate future growth changes in requirements.
5) Documentation:- while not as extensive as in large projects, clear and concise documentation is still valuable for small projects to aid in understanding and usage.
6) Community Support:- availability of Community Support and resources can be beneficial for developers working on small projects, facilitating trouble shooting and knowledge sharing.
7) Code Reusability:- Encouraging code reusability within the project and potentially across similar small-scale projects to optimize development efforts.

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ACTIVITY - 9

Identify different DevOps Tools and list their features?

1) Jenkins: An open-source automation server. Features include continuous integration, continuous delivery, and pipeline as code.
2) Git: A distributed version control system. Features include branching, merging, and tracking changes.
3) Docker: A containerization platform. Features include creating, deploying, and managing containers for applications.
4) Kubernetes: An open-source container orchestration platform. Features include automating deployment, scaling, and managing containerized applications.
5) Ansible: A open-source automation tool. Features include configuration management, application deployment, and task automation.
6) Chef: A configuration management tool. Features include infrastructure as code, continuous delivery, and automation of cloud resources.
7) Puppet: Another configuration management tool. Features include infrastructure automation, compliance enforcement, and node management.
8) Terraform: An infrastructure as code tool. Features include provisioning and managing infrastructure across various cloud providers.

9) Prometheus: An open-source monitoring and alerting toolkit. Features include collecting metrics, visualization, and alerting on abnormal behaviors.

10) Grafana: An open-source analytics and monitoring solution. Features include visualization of metrics and analytics, monitoring dashboards, and alerting.

11) Splunk: A platform for searching, monitoring, and analyzing machine generated data. Features include log analysis, real-time monitoring, and troubleshooting.

12) Jira: A project management tool by Atlassian. Features include issue tracking, agile project management, and workflow customization.

13) Confluence: Another tool by Atlassian for collaboration and documentation. Features include team collaboration, knowledge sharing, and document management.

14) Bitbucket: A Git repository management solution by Atlassian. Feature include Git code management, collaboration tools, and continuous delivery integration.

15) Azure DevOps: A suite of development and collaboration tools by microsoft. Features include version control, agile planning, and automated pipelines for CI/CD.

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ACTIVITY-10

Identify Container providers?

Container providers offer platforms or services for managing and deploying containers. Here are some notable container providers:

Docker: Docker provides tools and services for creating, managing, and deploying containers. Docker Engine is one of the most popular container runtimes.

Amazon Elastic Container service: AWS ECS is a fully managed container orchestration service for deploying, managing, and scaling containerized applications using Docker containers.

Amazon Elastic Kubernetes service: AWS EKS is a managed Kubernetes service for deploying, managing, and scaling containerized applications using Kubernetes.

Google Kubernetes Engine (GKE): GKE is a managed Kubernetes service provided by Google cloud platform for deploying, managing, and scaling containerized applications.

Microsoft Kubernetes: is a managed Kubernetes service offered by microsoft Azure for deploying, managing, and scaling containerized applications using Kubernetes.

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IBM Cloud Service:- IBM cloud Kubernetes service is a managed Kubernetes service that provides features such as automated cluster provisioning, built-in monitoring and logging, integration with IBM cloud services like IBM cloud object storage and IBM Watson services.

Digital ocean Kubernetes:- DigitalOcean Kubernetes is a managed Kubernetes service that provides features such as automated cluster provisioning, horizontal pod autoscaling, and integration with Digital-Ocean Load Balancers and DigitalOcean Block storage.

Rancher:- Rancher is an open-source container management platform that provides features such as centralized management of Kubernetes clusters, multi-tenancy support, and a rich ecosystem of plugins for networking, storage, and monitoring. It also offers features like role-based access control (RBAC) and cluster monitoring.

VMware Tanzu:- VMware Tanzu is a portfolio of products and services that includes Tanzu Kubernetes Grid (TKG) for deploying and managing Kubernetes clusters, Tanzu mission control for centralized management of Kubernetes clusters across multiple environments, and Tanzu Application Service (TAS) for deploying and managing modern applications.