UNIT I

Q.Define design thinking state any 4 example of design thinking?/ Whats is human centered explain process of design?

1. **Empathize**: This stage involves understanding the needs, wants, and challenges of the people who will use the product or service.

2. **Define**: In this stage, the insights gathered during the empathize stage are synthesized and used to define the core problems or opportunities that need to be addressed. This step involves framing the problem in a way that guides the design process.

3. **Ideate**: Ideation is the stage where designers generate a wide range of possible solutions to the defined problem.

4. **Prototype**: Prototypes can take many forms, from simple sketches or mockups to more advanced models or simulations.

5. **Test**: In the final stage of design thinking, prototypes are tested with users to gather feedback and insights.

Examples of design thinking in action:

Apple iPhone: Apple's success with the iPhone can be attributed in part to its application of design thinking principles

Airbnb: Airbnb used design thinking to disrupt the hospitality industry by understanding the needs and pain points of travelers and hosts.

IDEO's Shopping Cart Redesign: IDEO, a design consultancy, applied design thinking to redesign the shopping cart.

Procter & Gamble's Tide Pods: P&G used design thinking principles to develop Tide Pods, a convenient and mess-free laundry detergent solution.

UNIT II

2.What are user personal?state the needs of user finding persona

User personas are important in helping you design your product to meet the needs of your users.

Needs of finding user personal:

Understanding user

Decision Making

Communication

Empathy

3.Ideatation

Ideation in data thinking typically involves the following steps:

1. **Identifying Challenges or Opportunities**: These could be related to improving processes, optimizing performance, understanding customer behavior, identifying trends, or addressing any other relevant aspect of your organization or project.

2. **Understanding Data Sources**: Explore the various data sources available to you, including internal data from your organization's databases or systems, as well as external data from sources such as industry reports, public datasets, social media, and sensors.

3. **Brainstorming Data-Driven Solutions**: Facilitate brainstorming sessions where team members can generate ideas for how data could be used to address the identified challenges or opportunities.

4. **Prioritizing Ideas**: After generating a list of potential data-driven solutions, prioritize them based on factors such as feasibility, potential impact, resource requirements, alignment with organizational goals,

5. **Developing Prototypes or Proof of Concepts**: Once you have prioritized ideas, develop prototypes or proof of concepts to test and validate their feasibility and effectiveness.

6. **Iterating and Refining**: Iterate on your prototypes based on feedback and insights gathered during testing..

4.Mental Module :

Understanding Data Concepts: Mental models help individuals comprehend abstract data concepts and theories by providing a framework for organizing and contextualizing information.

Intepreting Data Relationships: Mental models enable individuals to perceive and interpret relationships between different data variables, such as correlations, causations, trends, and patterns.

Predicting Data Outcomes: Mental models allow individuals to anticipate and predict potential outcomes based on their understanding of data relationships and patterns.

Guiding Data-Driven Decision Making: Mental models influence how individuals approach and engage in data-driven decision-making processes.

Facilitating Communication and Collaboration: Mental models serve as a common language for communicating and collaborating with others in data-related contexts.

what is user testing/testing phase ?

Identifying Usability Issues:

Evaluating User Experience:

Validating Design Choices:

Iterative Improvement:

5.types of innovation.

1. **Product Innovation**:

   - **Market Research Data Analysis**: Analyzing market trends, customer feedback, and sales data to identify opportunities for new product development or improvement of existing products.

   - **User Behavior Analysis**: Studying user interactions and feedback to inform the design and features of new products, ensuring they meet user needs and preferences.

   - **A/B Testing**: Experimenting with different product variations and measuring user responses to optimize features, pricing, or user experience.

2. **Process Innovation**:

- **Process Optimization**: Using data analytics to identify bottlenecks, inefficiencies, or opportunities for automation in business processes.

- **Predictive Analytics**: Leveraging historical data to forecast demand, optimize inventory management, or predict equipment failures, leading to more efficient operations.

- **Lean Six Sigma**: Applying statistical analysis and data-driven methodologies to streamline processes, reduce waste, and improve quality.

3. **Business Model Innovation**:

- **Data Monetization**: Exploring new ways to generate revenue from data assets through data analytics, insights, or personalized services.

- **Subscription Models**: Analyzing customer behavior and preferences to design subscription-based business models that offer personalized experiences and value-added services.

- **Platform Innovation**: Using data to identify opportunities for platform expansion, ecosystem development, or partnerships that create new value for users and stakeholders.

4. **Service Innovation**:

- **Customer Journey Mapping**: Analyzing customer interactions across touchpoints to identify pain points

- **Feedback Analysis**: Mining customer feedback from various channels (e.g., surveys, social media, customer support) to identify areas for service improvement and innovation.

- **Predictive Service**: Using data analytics and machine learning to anticipate customer needs, proactively resolve issues, and personalize service offerings.

5. **Social Innovation**:

- **Community Engagement Data Analysis**: Analyzing social media data, online forums, or community feedback to understand societal issues, trends, and preferences for designing innovative social interventions.

- **Impact Assessment**: Using data-driven approaches to measure and evaluate the effectiveness of social programs, policies, or initiatives in addressing social challenges and achieving desired outcomes.
- **Collaborative Data Platforms**: Creating data-sharing platforms and networks to facilitate collaboration among stakeholders (e.g., governments, nonprofits, businesses) in addressing complex social problems.

6.journey maps:

1 Discovery Phase:

- **Identify Goals**: Define the objectives of the data analysis or decision-making process.
- **Research and Planning**: Gather relevant data sources, determine methodologies, and establish key performance indicators (KPIs).

2. Data Collection:

- **Data Sourcing**: Acquire data from internal sources (e.g., databases, CRM systems) and external sources (e.g., market research, third-party vendors).
- **Data Integration**: Consolidate and preprocess data from multiple sources to ensure consistency and quality.

3. Data Analysis:

- **Exploratory Data Analysis (EDA)**: Analyze and visualize the data to uncover patterns, trends, and insights.
- **Statistical Analysis**: Apply statistical techniques to test hypotheses, identify correlations, and derive meaningful conclusions.
- **Machine Learning**: Develop and train predictive models to forecast future trends or behavior based on historical data.

4. Insights Generation:

- **Interpretation**: Translate data analysis findings into actionable insights and recommendations.
- **Visualization**: Present insights using charts, graphs, and dashboards to facilitate understanding and decision-making.
- **Storytelling**: Craft narratives that communicate the significance of the data findings and their implications for business or strategy.

5. **Decision Making**:

- **Risk Assessment**: Evaluate the potential risks and uncertainties associated with different courses of action.
- **Scenario Planning**: Explore alternative scenarios and their potential outcomes to inform decision-making under uncertainty.

6. **Implementation and Monitoring**:

- **Action Planning**: Develop strategies and initiatives based on data-driven insights to achieve desired outcomes.
- **Performance Measurement**: Establish metrics and benchmarks to track the progress and effectiveness of implemented initiatives.
- **Feedback Loop**: Continuously gather feedback and data to refine strategies and adapt to changing circumstances.

7. **Iterative Improvement**:

- **Learning and Adaptation**: Reflect on successes and failures, identify lessons learned, and incorporate feedback into future data-driven initiatives.
- **Continuous Optimization**: Iterate on data collection, analysis, and decision-making processes to improve efficiency, accuracy, and impact over time.

7.qualities for managing innovation

1Analytical Skills:

2.Strategic Thinking:

3.Creativity and Innovation:

4.Technical Proficiency

5.Communication Skills

6.Risk Management:

7.Results Orientation

8.Short Note on Storytelling:

Effective storytelling in data thinking involves several key elements, including:

1. **Audience Understanding**: Tailoring the narrative to the needs, interests, and knowledge level of the audience to ensure relevance and engagement.

2. **Compelling Structure**: Crafting a narrative arc with a clear beginning, middle, and end that draws the audience in, maintains their attention, and delivers a satisfying conclusion.

3. **Visual Representation**: Incorporating data visualization techniques, such as charts, graphs, and infographics, to enhance understanding and reinforce key messages.

4. **Contextualization**: Providing context and background information to help the audience interpret the data and understand its implications within a broader context.

5. **Emotional Appeal**: Tapping into emotions, values, and human experiences to create resonance and foster empathy with the audience.

what is prototype and prototyping strategies. ?

Throwaway Prototyping:

- Also known as rapid prototyping or exploratory prototyping.

Incremental Prototyping:

- Involves gradually building and refining the prototype in multiple iterations.

Evolutionary Prototyping:

- Focuses on developing a basic prototype with core functionalities first.

Horizontal Prototyping:

- Involves building prototypes that represent the breadth of features or functionalities across the system or product.

Vertical Prototyping:

- Focuses on developing prototypes that delve deeply into specific features or functionalities.

Strategies if Prototypes:

1. **Iterative Prototyping**:

   - Involves developing prototypes in iterative cycles, with each iteration building upon the insights and feedback from previous iterations.

2. **User-Centered Design**:

   - Focuses on incorporating user feedback and input throughout the prototyping process to ensure that data-driven solutions meet user needs and preferences.

3. **Agile Prototyping**:

   - Adapts agile development principles and methodologies to the prototyping process, emphasizing flexibility, collaboration, and rapid iteration.

4. **Minimum Viable Product (MVP)**:

   - Focuses on developing a minimal version of a data-driven solution or analytical model that addresses core user needs or objectives.

5. **Experimental Prototyping**:

   - Involves conducting controlled experiments or A/B tests to evaluate the effectiveness of different data-driven approaches or algorithms.

6. **Collaborative Prototyping**:

   - Emphasizes collaboration and cross-functional teamwork between data scientists, analysts, domain experts, and stakeholders throughout the prototyping process.

4.Research and types of reaserch.

Research is the careful consideration of study regarding a particular concern or [research problem](#) using scientific methods.

1. **Qualitative Research**:

   - **Ethnography**: Immersion in a culture or group to understand their behavior and perspectives.
   - **Case Study**: In-depth analysis of a particular individual, group, or situation.
   - **Interviews**: Structured or unstructured conversations to gather subjective insights.
   - **Focus Groups**: Group discussions to explore opinions and attitudes.
   - **Content Analysis**: Systematic analysis of textual or visual material to identify patterns or themes.

2. **Quantitative Research**:

   - **Surveys**: Questionnaires distributed to a sample population to gather numerical data.
   - **Experiments**: Controlled studies to test hypotheses and establish cause-effect relationships.
   - **Observational Studies**: Systematic observation of phenomena to gather data on natural behaviors.
   - **Correlational Studies**: Examination of the relationship between two or more variables.
   - **Meta-analysis**: Statistical synthesis of results from multiple studies on a particular topic.

It involves several Research steps:

Problem Identification:

Data Collection:

Data Cleaning:

Data Analysis:

Insights Generation:

Decision Making: **Iteration**:

Enthnography research:

1. **Participant Observation**:

   - Ethnographers immerse themselves in the community or culture they are studying, actively participating in everyday activities, rituals, and interactions.

2. **Fieldwork**:

   - Ethnographic research typically involves extended periods of fieldwork, ranging from several weeks to several years, depending on the scope and objectives of the study.

3. **Data Collection**:

   - Ethnographers employ various data collection methods, including participant observation, interviews, focus groups, and document analysis.

4. **Emic Perspective**:

   - Ethnography emphasizes the emic perspective, which focuses on understanding phenomena from the insider's point of view.

5. **Thick Description**:

   - Ethnographers aim to provide "thick description" of their findings, capturing the intricacies and nuances of social life in rich detail.

6. **Reflexivity**:

   - Ethnographers acknowledge their own subjectivity and biases and engage in reflexive practices to critically examine their role in shaping the research process and interpreting the data.

7. **Analysis and Interpretation**:

   - Ethnographic data analysis is iterative and inductive, involving the identification of patterns, themes, and relationships emerging from the data.

8. **Ethical Considerations**:

- Ethnographers adhere to ethical principles, such as informed consent, confidentiality, and respect for cultural norms and practices.

Que : Case Study of case study Implement design thinking process for am social project

. Empathize:

2. Define:

3. Ideate:

4. Prototype:

5. Test:

6. Implement:

7. Evaluate:

8. Iterate:

Outcome:

- The mental health support app for teenagers becomes widely adopted, empowering young people to better manage their mental well-being and access support resources in times of need. The project demonstrates the effectiveness of design thinking in creating user-centered solutions for social impact.

Unit IV

Question 1: Innovation role of design thinking ? explain type of Innovation and techniques ?

Design thinking plays a crucial role in fostering innovation by providing a structured approach to problem-solving that emphasizes empathy, creativity, and iterative experimentation. Here's an overview of the innovation role of design thinking, along with different types of innovation and techniques associated with each:

1. Innovation Role of Design Thinking:

- **User-Centered Approach**: Design thinking puts users at the center of the innovation process, focusing on understanding their needs, behaviors, and preferences through empathy and observation.

- **Creative Problem Solving**: Design thinking encourages divergent thinking and exploration of multiple solutions to a problem, fostering creativity and out-of-the-box thinking.

- **Iterative Prototyping**: Design thinking advocates for rapid prototyping and iteration, allowing ideas to be tested and refined through feedback from users and stakeholders.

- **Cross-Disciplinary Collaboration**: Design thinking promotes interdisciplinary collaboration, bringing together diverse perspectives and expertise to generate innovative solutions.

- **Human-Centered Design**: Design thinking emphasizes creating solutions that are not only functional and feasible but also desirable and meaningful to users, leading to more impactful and sustainable innovations.

2. Types of Innovation and Techniques:

a. Product Innovation:

b. Process Innovation:

c. Service Innovation

d. Business Model Innovation:

e. Social Innovation:

Question : Qualities of mapping Innovation ?Explain the impack Innovation and process driving invocation?

Here are qualities associated with mapping innovation:

1. **Comprehensive Understanding**:

2. **Holistic Perspective**.

3. **Strategic Alignment**:

4. **Continuous Learning**:.

5. **Data-Driven Insights**:

6. **Collaborative Approach**:

7. **Visualization and Communication**:

Regarding the impact of innovation and the process driving innovation:

Impact of Innovation:

Innovation has a profound impact on organizations, industries, economies, and society as a whole. Some key impacts of innovation include:

1. **Economic Growth**: Innovation drives productivity, competitiveness, and job creation, leading to economic growth and prosperity.
2. **Market Disruption**: Innovative products, services, and business models disrupt existing markets, create new opportunities, and reshape industries.
3. **Social Progress**: Innovation addresses societal challenges, improves quality of life, and promotes sustainability, equity, and inclusivity.
4. **Global Competitiveness**: Innovation enhances a nation's competitiveness in the global economy by fostering technological leadership, entrepreneurship, and creativity.
5. **Environmental Sustainability**: Innovation drives the development of clean technologies, renewable energy sources, and sustainable practices to address environmental challenges and mitigate climate change.

Process Driving Innovation:

1. **Ideation**: Generating and exploring new ideas through brainstorming, design thinking, and creativity techniques.

2. **Experimentation**: Testing and validating ideas through prototyping, pilot projects, and iterative feedback loops.
3. **Collaboration**: Engaging cross-functional teams, partners, customers, and stakeholders in the innovation process to leverage diverse perspectives and expertise.
4. **Risk-Taking**: Encouraging a culture of experimentation, failure tolerance, and learning from setbacks to foster innovation and creativity.
5. **Strategic Alignment**: Aligning innovation efforts with organizational goals, market opportunities, and customer needs to ensure relevance and impact.
6. **Continuous Improvement**: Iterating on innovations based on feedback, data insights, and changing market dynamics to enhance effectiveness, scalability, and sustainability.