

# DESIGN THINKING

DIPLOMA WALLAH

CSE

**Jharkhand University Of Technology (JUT)**

**Unit- 03**

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## 1. Use of Diagrams and Maps in Design Thinking

### 1.1 Empathy Map

#### **Definition:**

An empathy map is a collaborative visualization tool that captures what a user *says, thinks, does, and feels*. It helps teams build a shared understanding of user experience and uncover insights for design.

([Nielsen Norman Group](#))

#### **Structure:**

Typically four quadrants around the user persona: Says, Thinks, Does, Feels.

#### **Steps to create:**

- Define the user/persona.
- Gather qualitative data via interviews/observation.
- Populate each quadrant with sticky-notes or cards (quotes, behaviours, feelings).
- Cluster themes and derive insights (e.g., contradictions between what user says vs does).

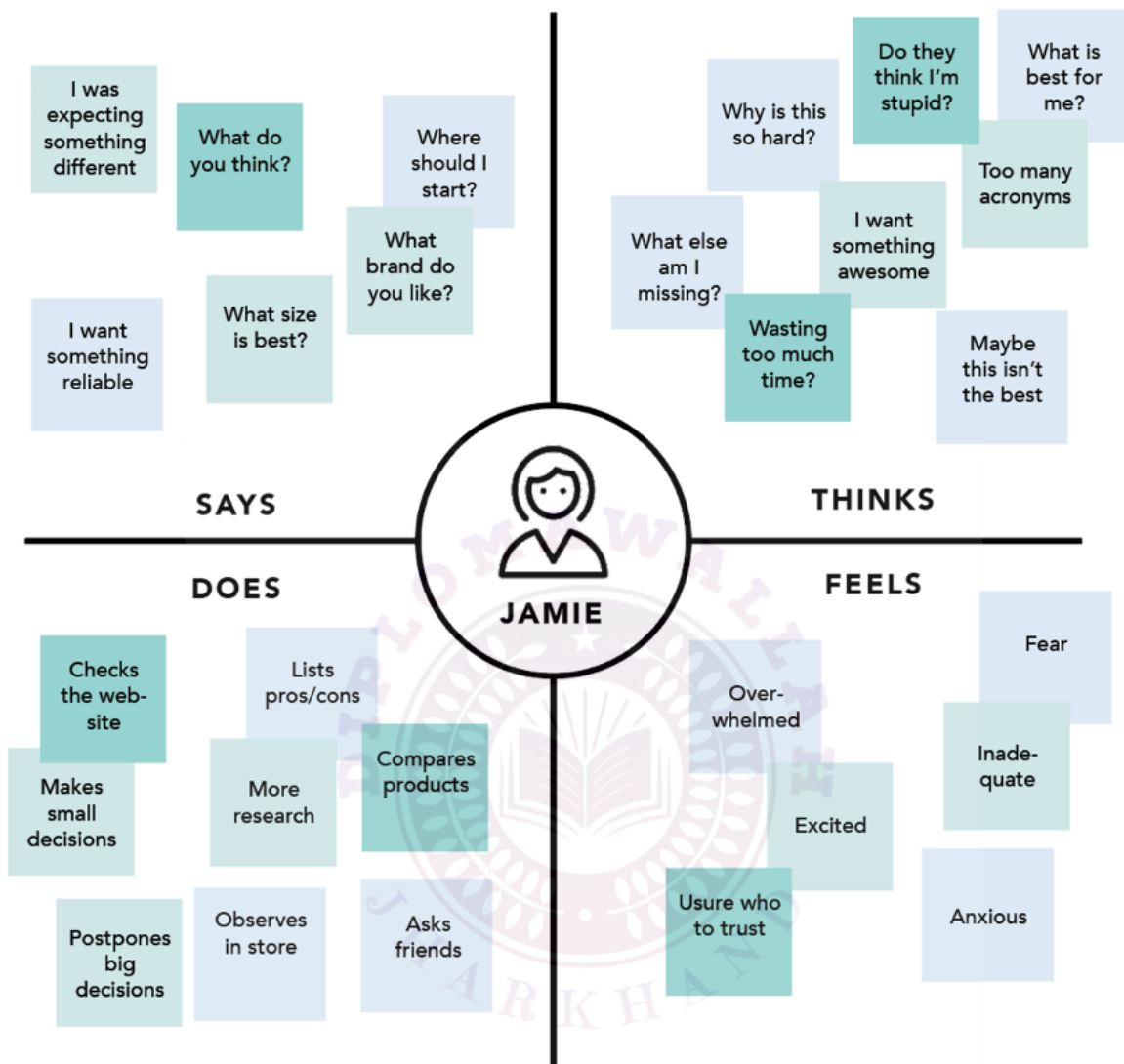
#### **Usage & importance:**

- Helps avoid designer assumptions and connect with real user mindset.
- Acts as a reference point during ideation/prototyping.

**Example:** A student using your notes portal might *say* “I can’t find what I need”, *think* “I am behind schedule”, *do* keep switching tabs, *feel* frustrated/overwhelmed.

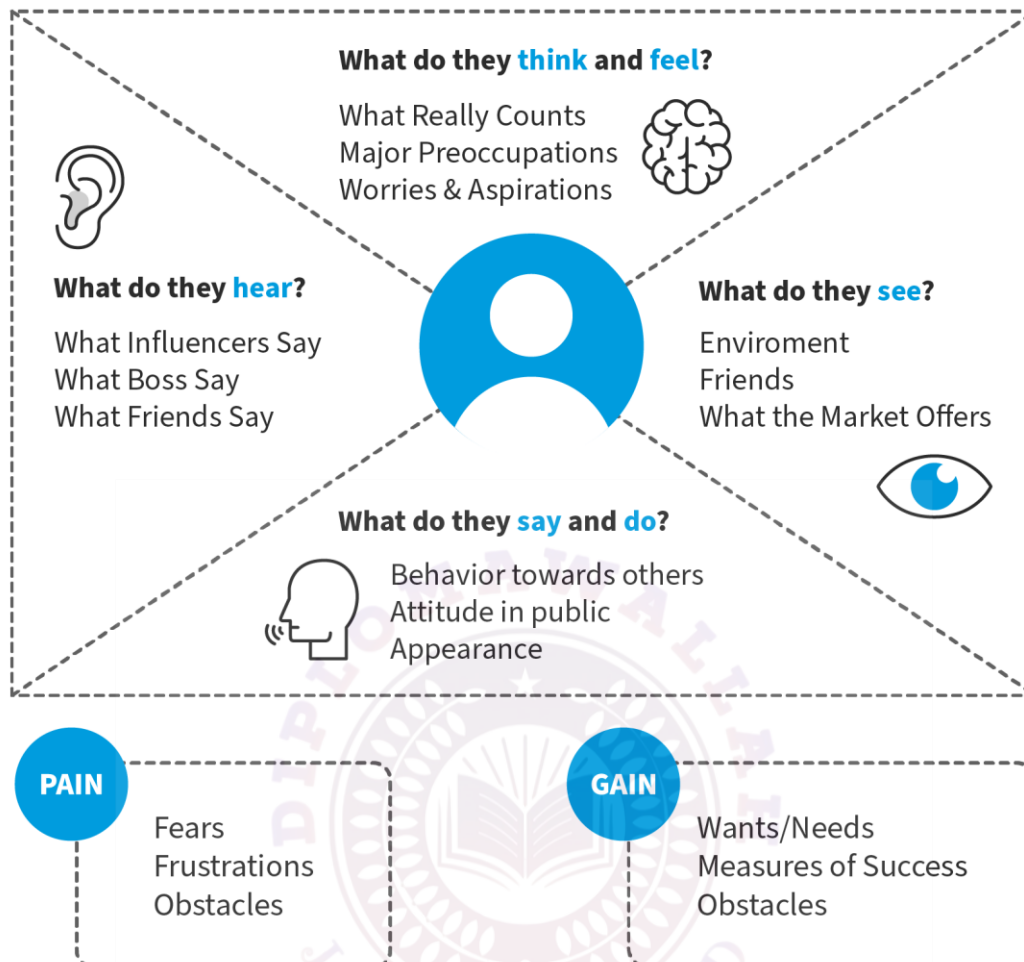
**Exam tip:** Define what an empathy map is, list its four quadrants, explain how to build it and why it is used in design thinking.

## EMPATHY MAP *Example (Buying a TV)*

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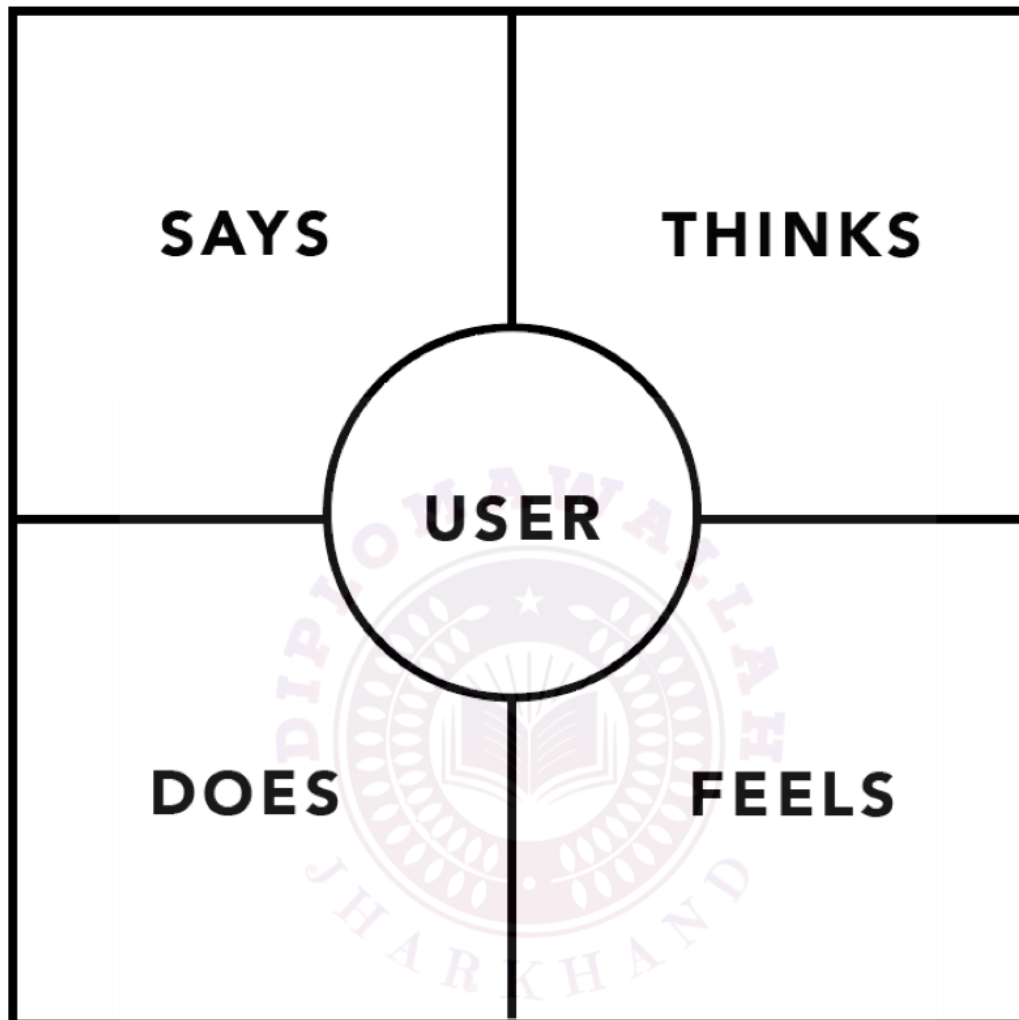


## Empathy Map



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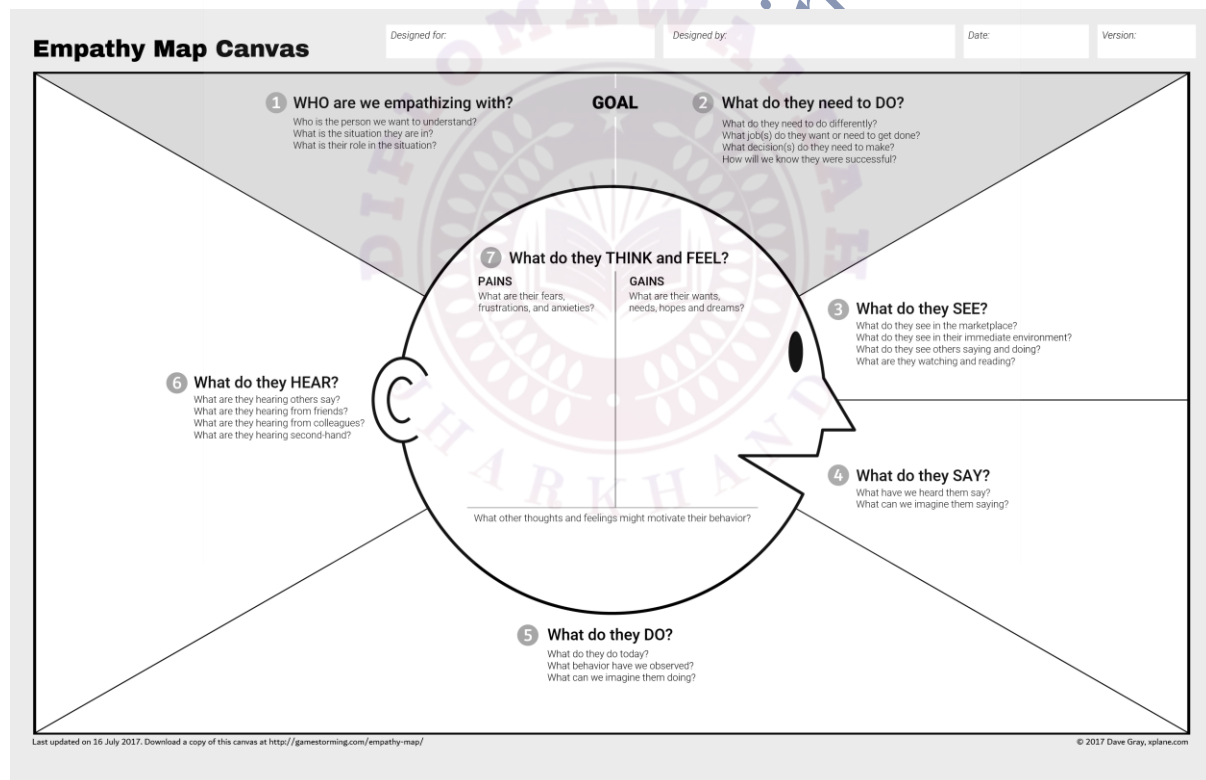
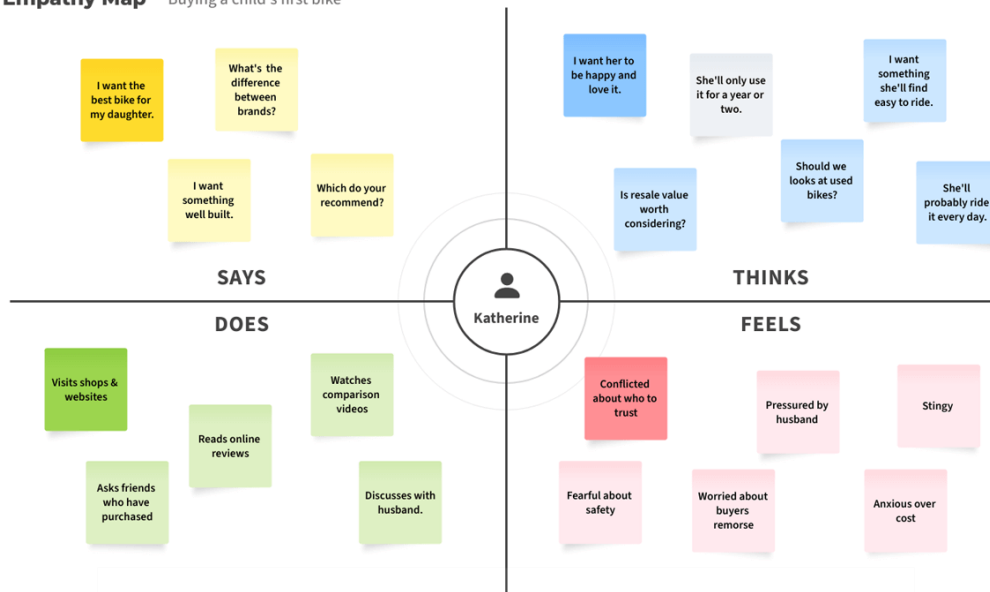
# EMPATHY MAP



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### Empathy Map

Buying a child's first bike



## 1.2 Affinity Diagram

### Definition:

An affinity diagram (also known as the KJ-method) is a tool used to organise a large number of ideas/data points into natural groups based

on their inherent relationships. ([Wikipedia](https://en.wikipedia.org/wiki/Affinity_diagram))

### Process:

- Write each idea/data point on cards or sticky notes.
- Sort/group similar cards into clusters.
- Label clusters to reflect overarching themes.

### Purpose in design thinking:

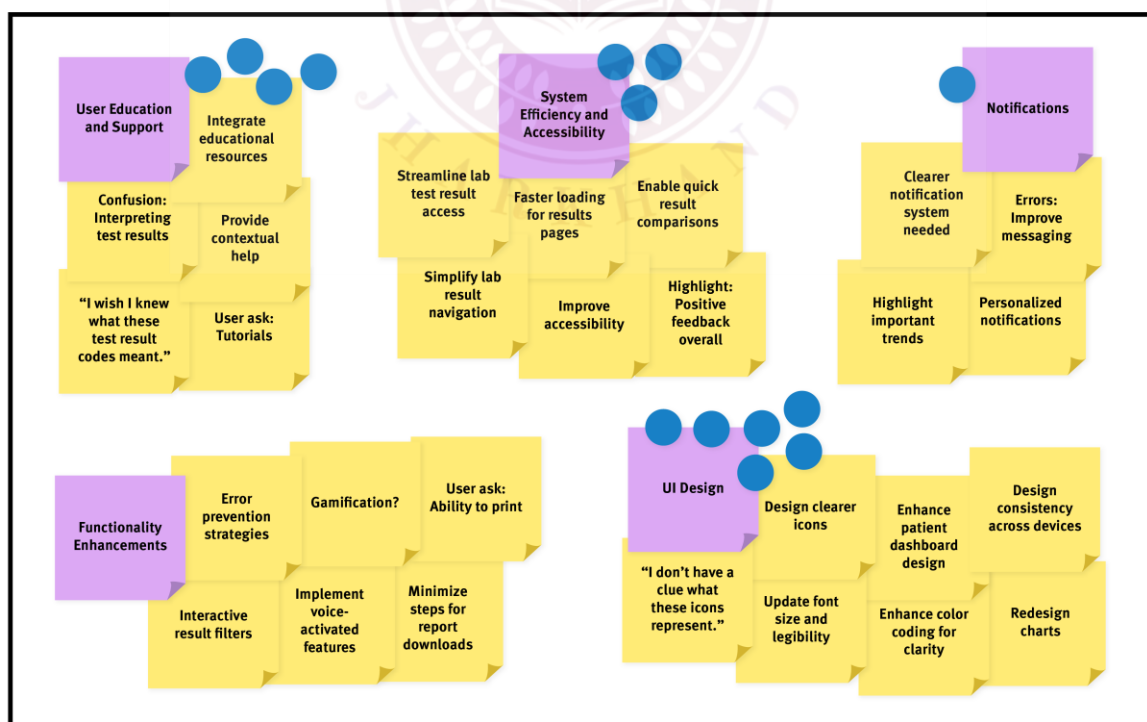
After brainstorming or data collection (e.g., from empathy maps), affinity diagrams help to synthesise, order and make sense of the mass of data. They support moving from divergence (many ideas) to convergence (themes/patterns).

**Example:** After users interviews, you might have 50 notes – grouping them into clusters like “download issues”, “search difficulties”, “mobile interface pain”, leads to deeper insights.

**Exam tip:** Define affinity diagram, list steps (record, group, label), mention roles/benefits (makes sense of big data, aids insight formation).

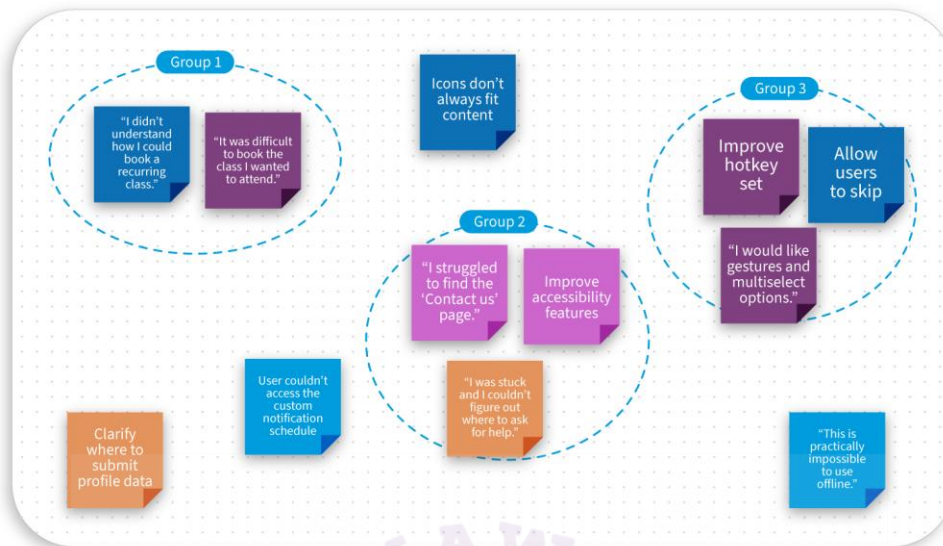
## Affinity Diagramming

### Step 3: Prioritize Clusters and Next Steps



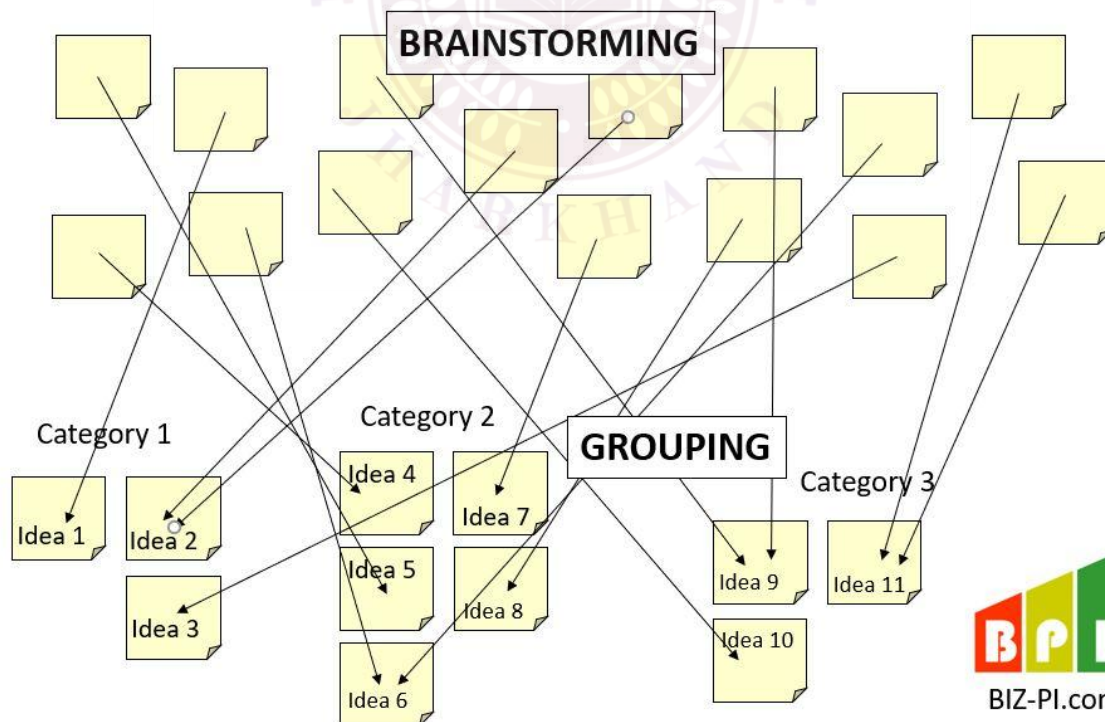


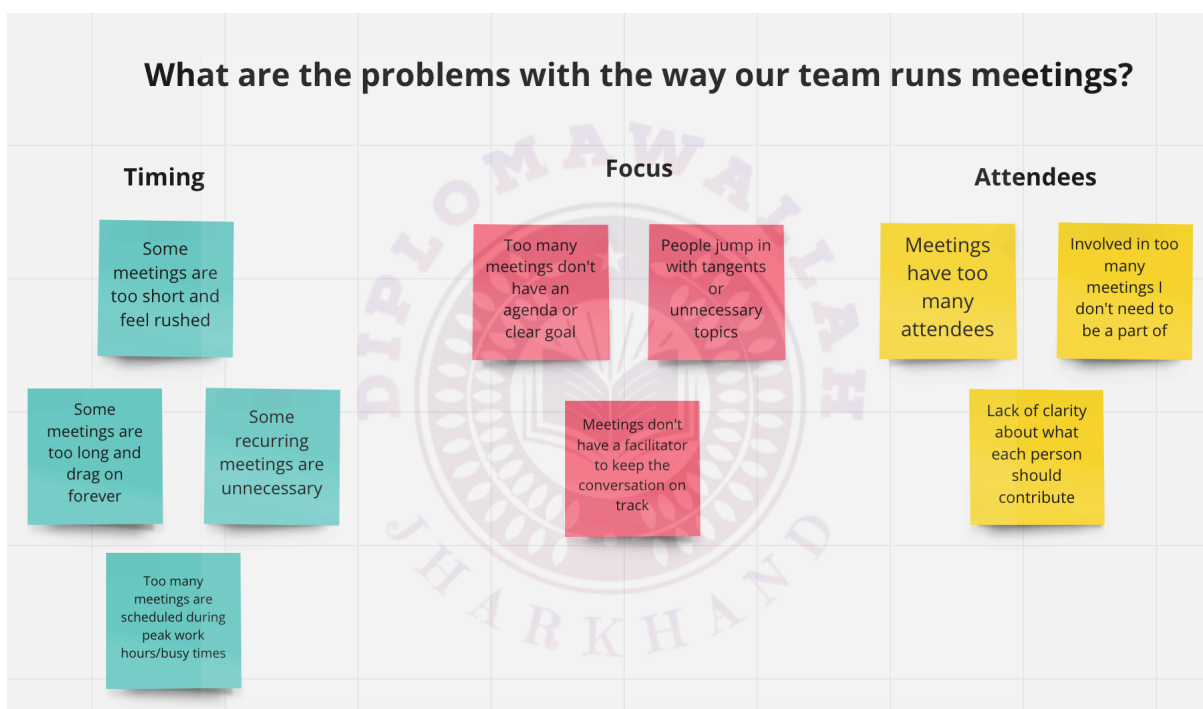
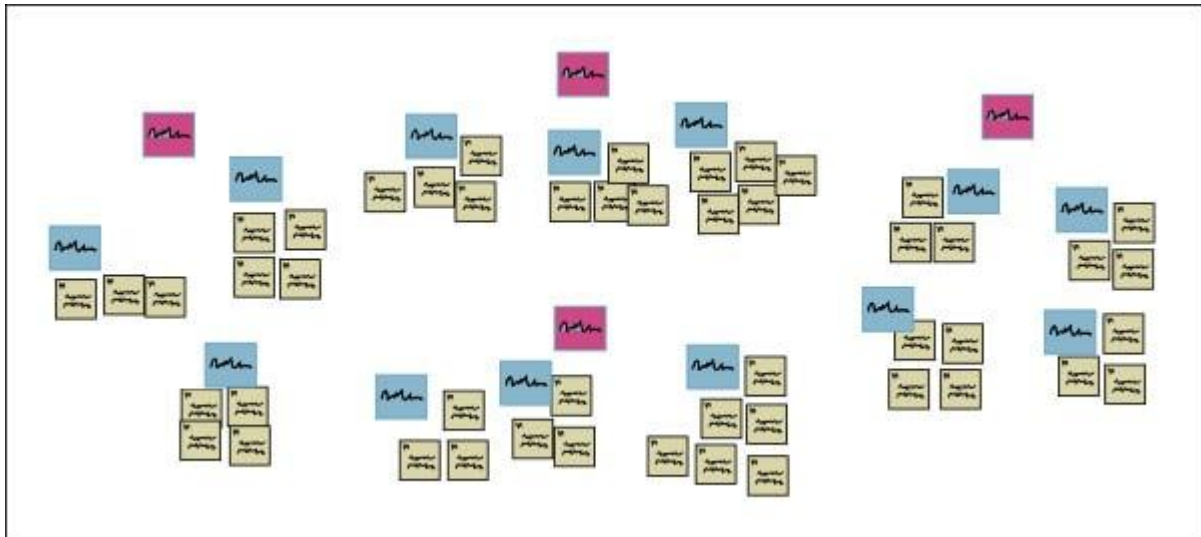
## How to Create an Affinity Diagram: 2. Group

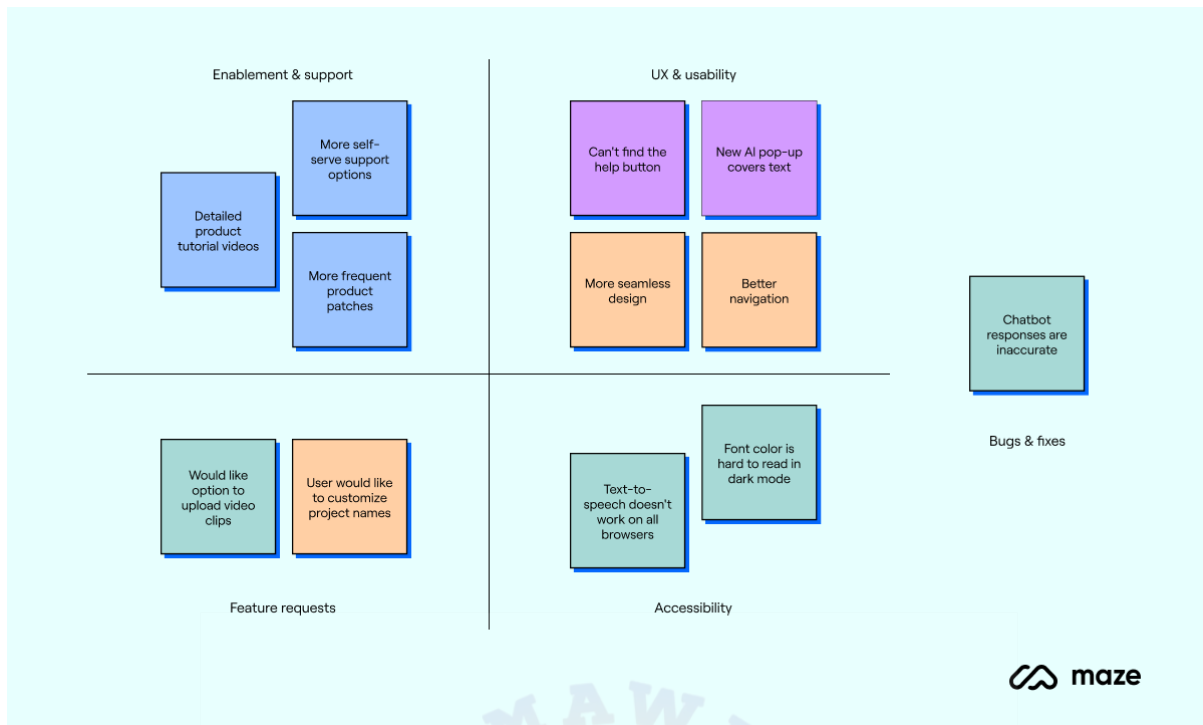


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## AFFINITY DIAGRAM (KJ METHOD)







### 1.3 Mind Map

#### Definition:

A mind map is a visual diagram that organises information around a central concept, branching out into sub-topics and showing relationships among ideas. ([Wikipedia](https://en.wikipedia.org/wiki/Mind_map))

#### Structure & Features:

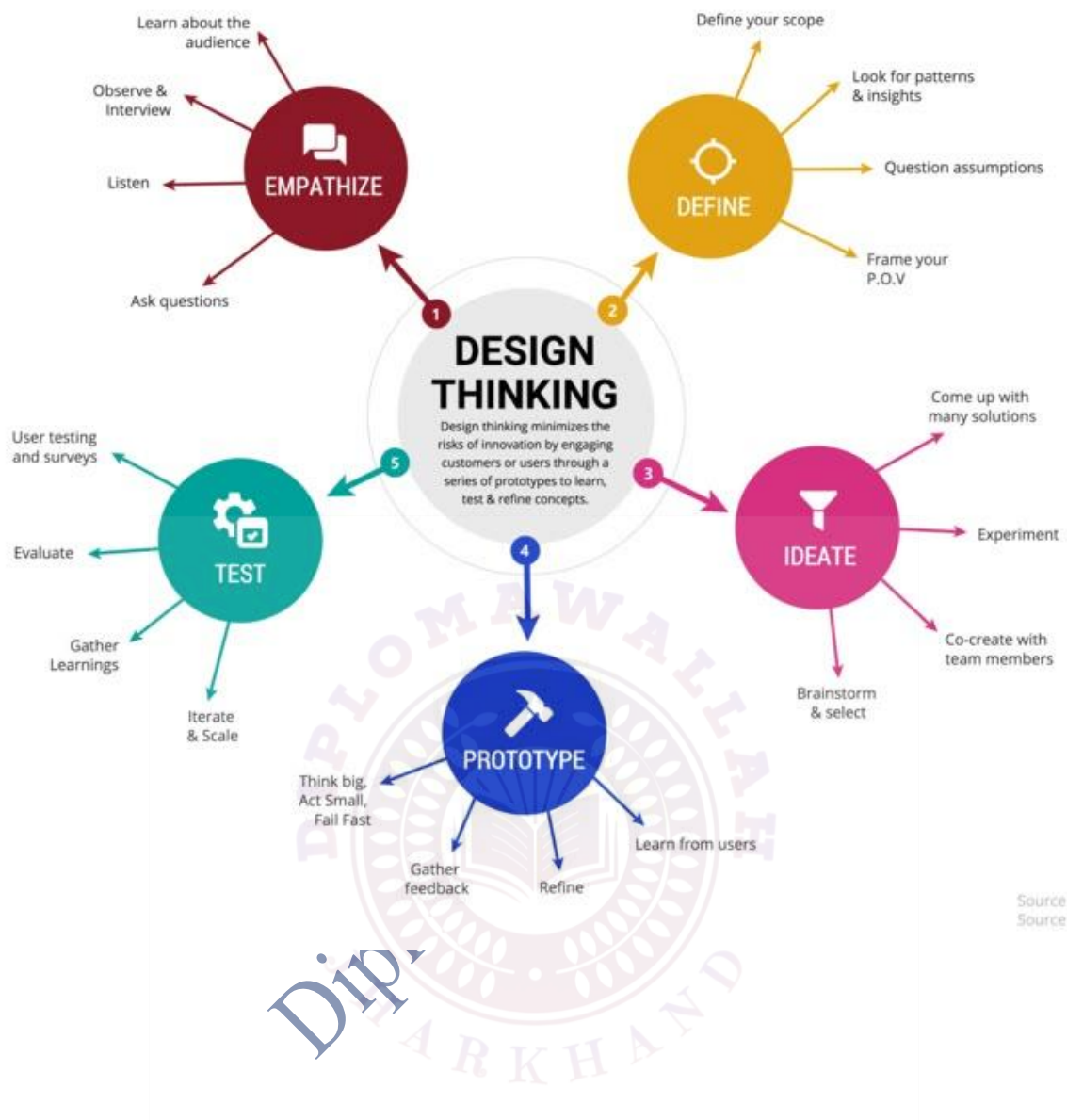
- Central node (main idea) in center.
- Branches to major sub-topics, further branches to details.
- Use of colours, icons, images improves memory and association.

#### Purpose in design thinking:

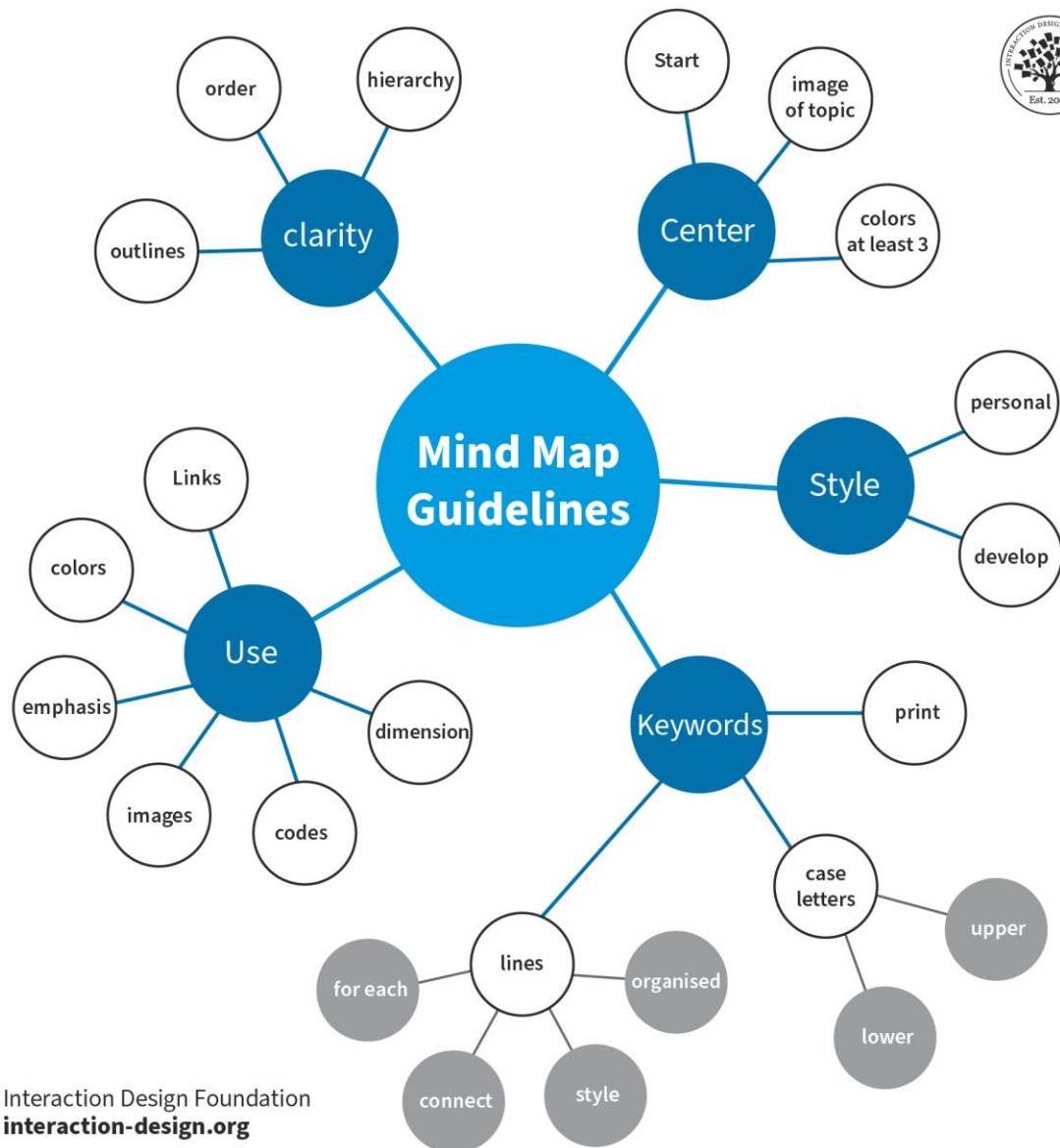
- Helps during ideation: to explore many interconnected ideas from a central challenge.
- Useful for planning, mapping complex innovation concepts, showing interrelations.

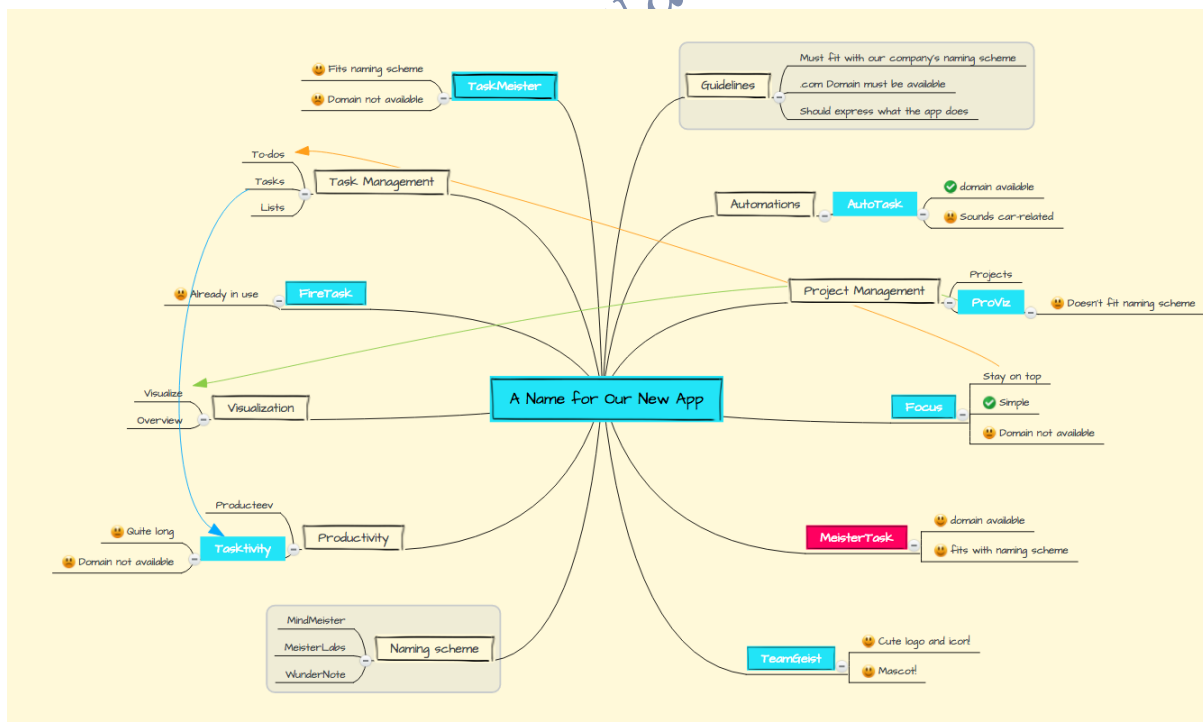
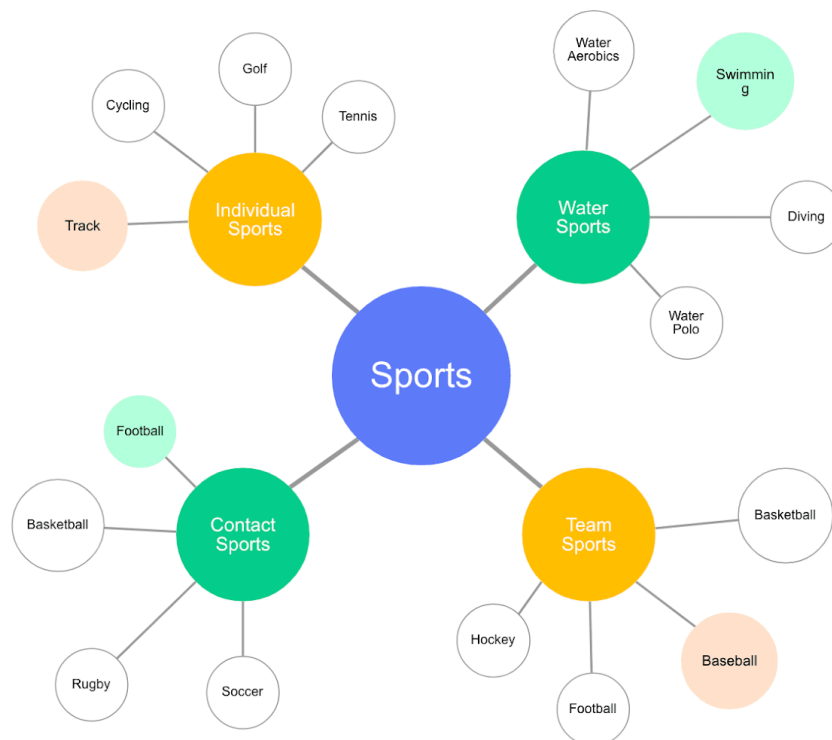
**Example:** For your notes portal project: central node “Download Portal” → branches: “Mobile UI”, “Search/filter”, “Night mode”, “Feedback system” → further branches each.

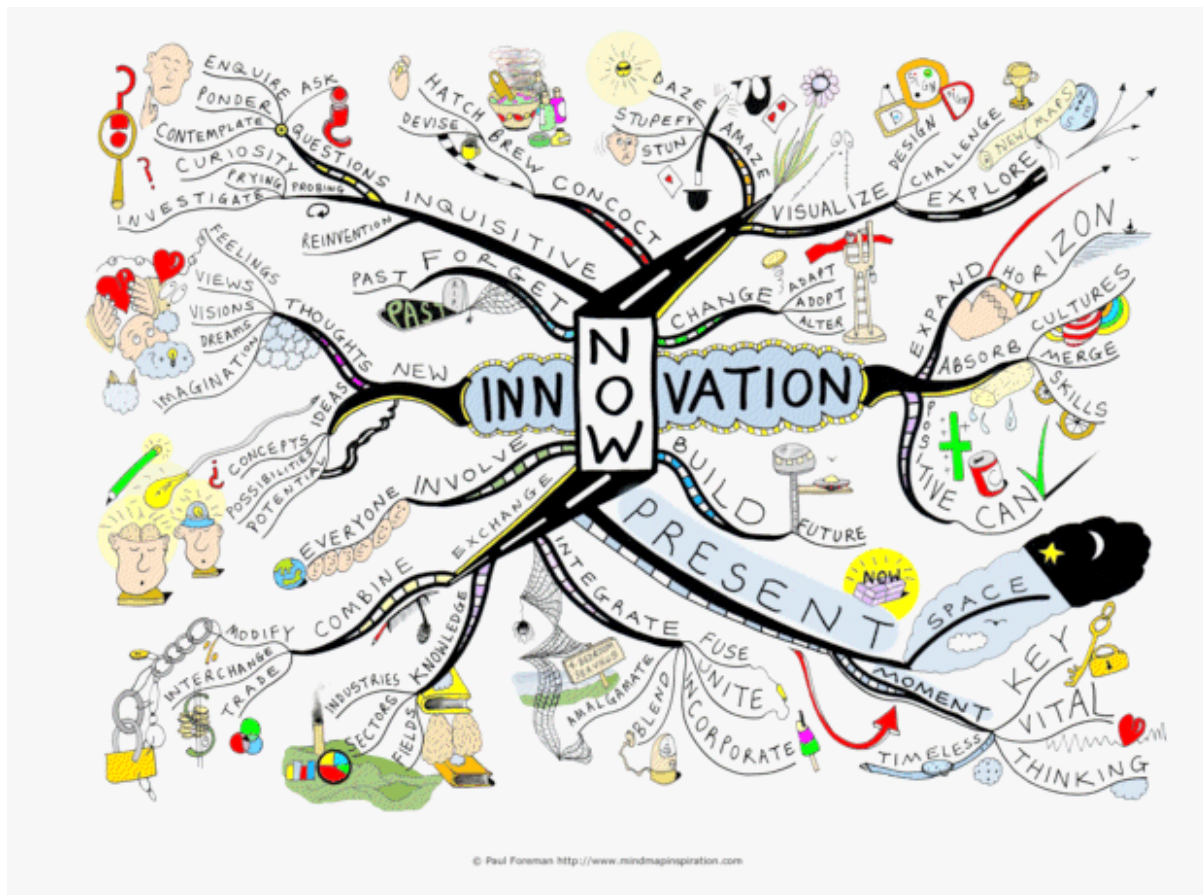
**Exam tip:** Define mind map, describe how it's drawn, list 3 key features and 1 example of its use in ideation/innovation.



Source 1  
Source 2







## 1.4 Journey Map

**Definition:**

A journey map (or user journey map) is a visual representation of the user's process as they move through a product/service, capturing their actions, emotions, pain points and touchpoints across time. ([Nielsen Norman Group](#))

### Structure:

Often a timeline or step-by-step flow: Stage 1 → Stage 2 → ... Each stage includes user's goal, actions, thoughts, feelings, opportunities for

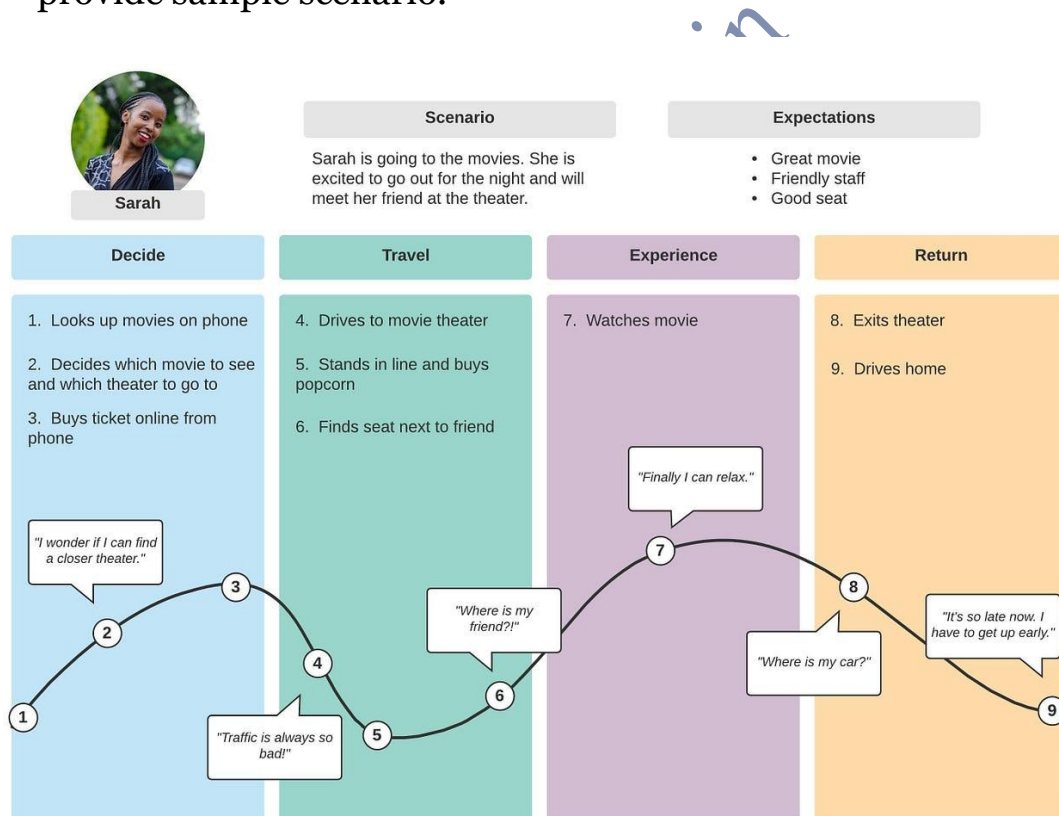
improvement.

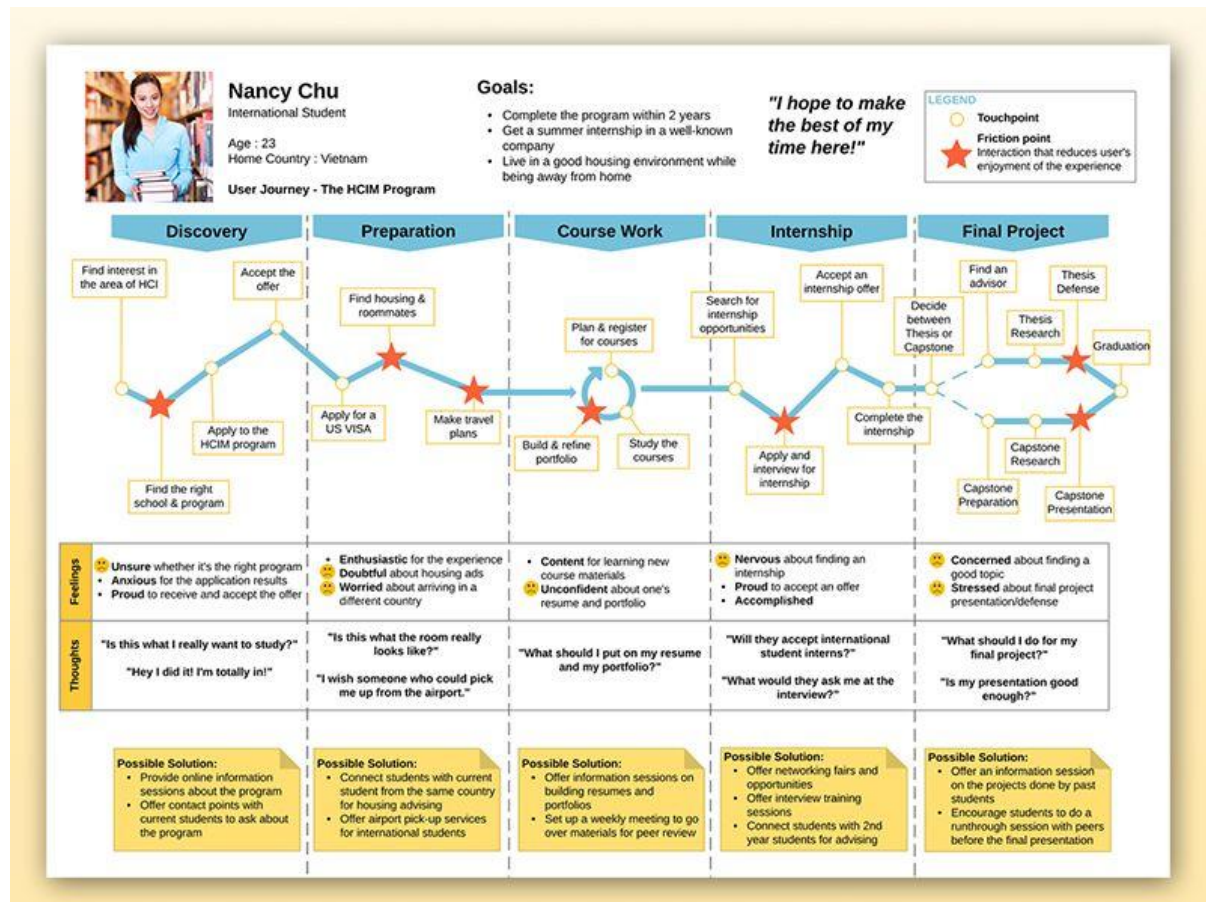
### Purpose in design thinking:

- Helps identify key touchpoints and emotional peaks/troughs in user experience.
- Supports insight into where user experience breaks down and where innovation can target improvements.

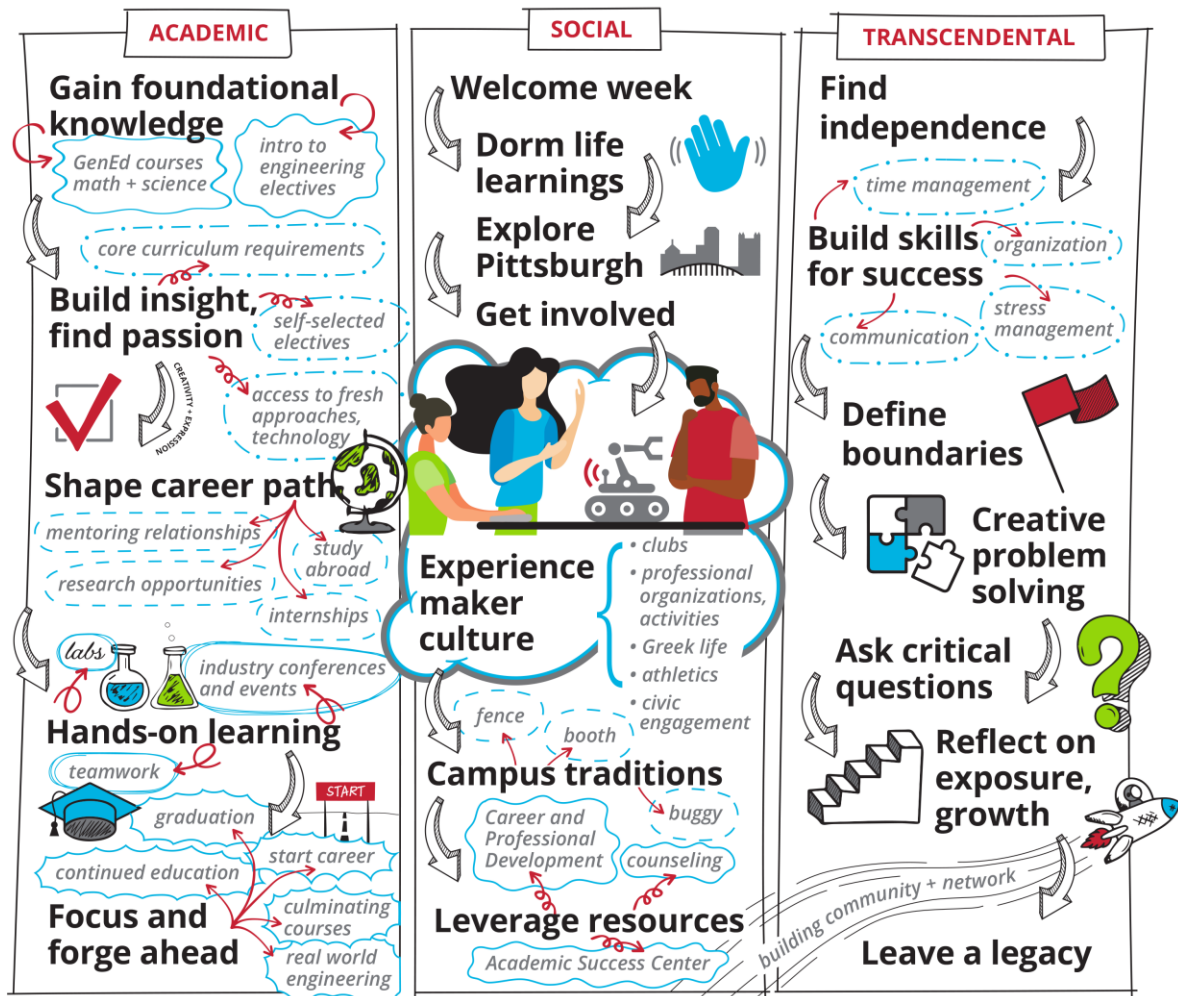
**Example:** Student journey: Notification of upcoming exam → Logs into portal → Searches for notes → Downloads file → Studies → Fails/Passes → Feedback. At each stage, mark pain points (slow loading), feelings (anxious), opportunities (offline downloads).

**Exam tip:** Define journey map, describe its components (Stages, Actions, Thoughts, Emotions, Pain/Opportunities), mention purpose (experience improvement, scope for innovation) and provide sample scenario.



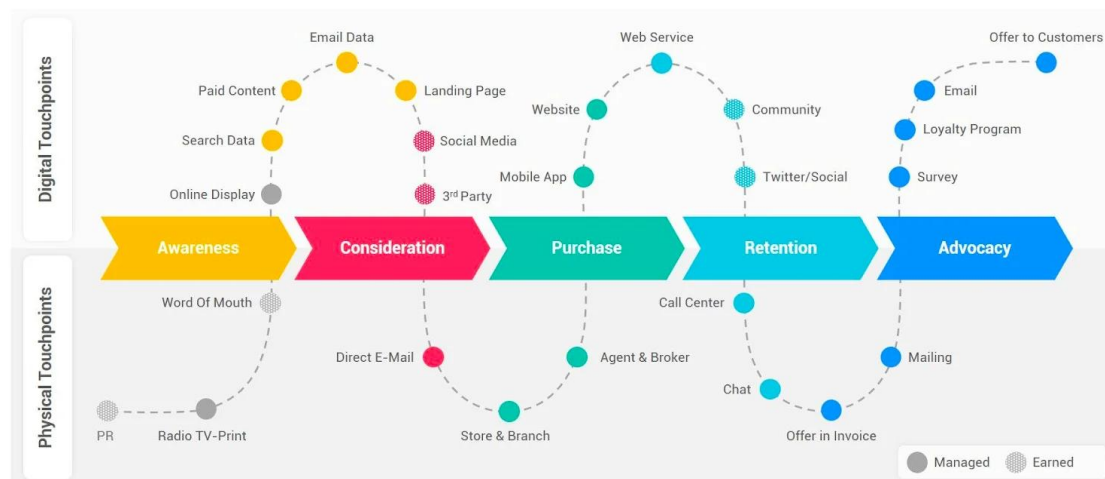


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## Customer Journey Maps

Type The Subtitle Of Your Great Here



## CUSTOMER JOURNEY MAP *Shopping for a New Car*

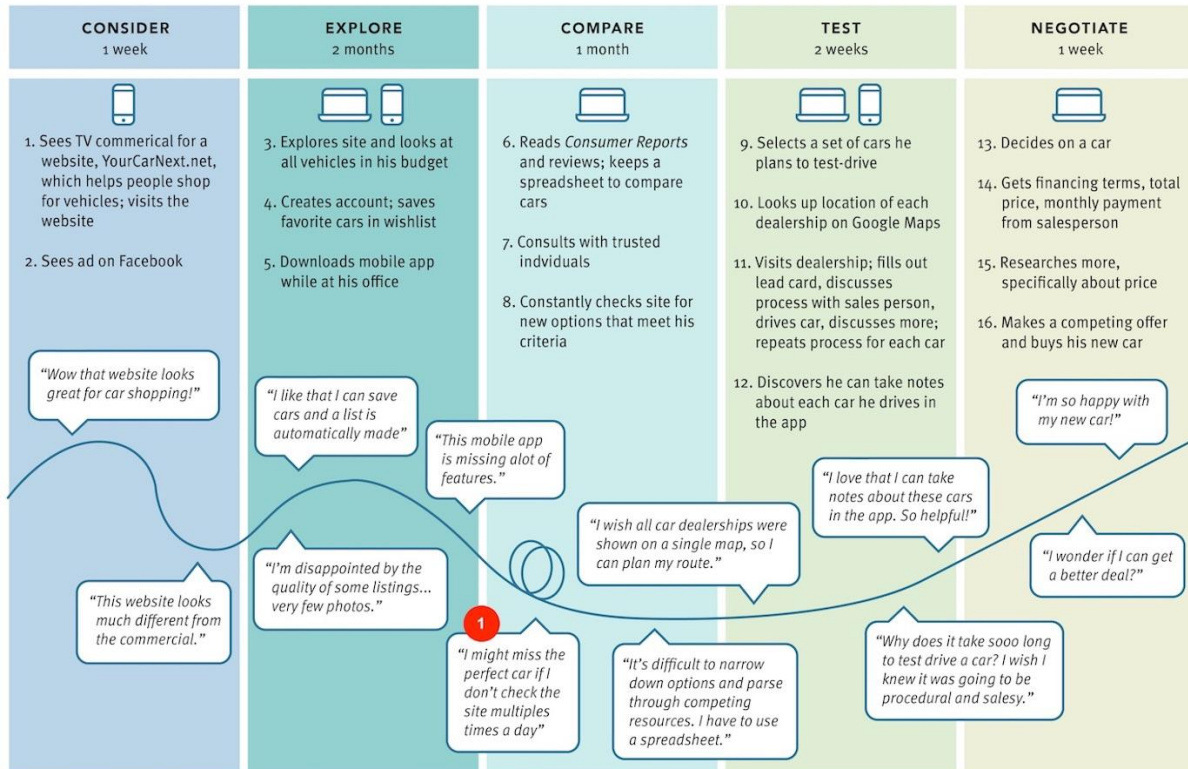


### EMOTIONAL ERIC

Eric is an emotional car buyer. He purchases based on aesthetics and status.  
**Scenario:** Eric recently moved to the area. He is shopping for a car that is fun to drive and dependable enough for use for everyday commuting.

### EXPECTATIONS

- Ability to compare cars and their breakdowns
- Good photography with closeups, inside and out
- Video overview of car with demonstrations



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## 1.5 Combining Ideas into Complex Innovation Concepts

### Concept:

Once you have multiple visual tools (empathy map, affinity diagram, mind map, journey map), you combine & synthesise them to form richer, layered innovation concepts. This involves pulling together user insights, data clusters, idea maps and journey analytics to define a high-level solution concept.

### Process:

- Use empathy map → derive user needs & pain points.
- Use affinity diagram to cluster insights.
- Use mind map to explore solution space around these clusters.
- Use journey map to situate ideas across the user's lifecycle.

- Then weave all into a complex innovation concept (e.g., “Adaptive download portal with real-time usage insights, offline access, personalised recommendations and feedback loop”).

**Why critical:**

- Supports deeper, systemic innovation rather than isolated features.
- Ensures user needs, service lifecycle and idea space are all aligned.

**Exam tip:** When asked “How do you combine diagrams/maps for innovation?”, describe sequence of tools, show their relationships, give example of final innovation concept.

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## **2. Storytelling – Improvisation, Scenario Planning, Development of Scenarios, Evaluation Tools, frog design and Prototyping**

### **2.1 Storytelling in Design Thinking**

**Definition:**

Storytelling in design thinking is the craft of using narrative to connect stakeholders, users and designers around the “why” and “how” of an innovation — conveying context, emotion, future scenarios and the value of the idea. ([Medium](#))

**Key Elements:**

- Character (user persona)
- Setting (context/situation)
- Conflict (pain point or problem)
- Resolution (innovation or outcome)

**Purpose:**

- Creates empathy and alignment across team/stakeholders.
- Helps conceptualize innovation as a lived experience rather than abstract feature.

**Example:** “Riya is a third-year diploma student. It’s 11 pm; she is tired and the portal download fails... She switches to offline portal with one click, relaxes and completes her review before deadline.”

**Exam tip:** Define storytelling, list 4 key elements, explain why it’s used in design thinking.

### **2.2 Improvisation & Scenario Planning**

**Improvisation:**

- The ability to adapt stories or user journeys on the fly in workshops or team discussions.
- Encourages creative exploration of “what if?” situations in real time.

**Scenario Planning:**

- Technique of constructing multiple plausible future states (scenarios) to prepare design strategy. Designers create different “worlds” (futures) and test how solutions fit each. ([Hinesight...for Foresight](#))

**Process:**

- Identify driving forces (trends, uncertainties)
- Build scenario narratives (e.g., “Portal in low-connectivity rural setting”, “Portal in high-speed 5G environment”)
- Evaluate how solution performs under each scenario

**Purpose:**

- Helps design resilient and adaptable innovations.
- Reveals hidden assumptions and prepares for variations.

**Exam tip:** Describe scenario planning steps, explain its use, give example of scenario for your domain.

**2.3 Development of Scenarios & Evaluation Tools****Development of Scenarios:**

- Create detailed narratives with user persona, environment, triggers, behaviours, pain points, innovation interactions.
- Use diagrams/maps to visualise scenario timeline, touchpoints, emotions.

**Evaluation Tools:**

- Criteria checklists (usability, feasibility, desirability)
  - Story-boarding to test scenario flows
  - Prototyping within scenarios and capturing feedback
- Example:** Evaluate portal innovation: consider “download under 2 seconds”, “offline access reliable”, “night mode comfortable” — these become evaluation criteria.

**Exam tip:** When asked “What tools would you use to evaluate scenario?”, list checklists, story-boards, prototypes, user testing with criteria.

## 2.4 frog Design & Prototyping

### About frog design:

frog design is a global design and strategy firm that emphasises human-centred innovation and systemic design-thinking. Their work often includes scenario planning, rich prototyping and organisational culture transformation. ([frog, part of Capgemini Invent](#))

### Prototyping:

- Definition: A prototype is a preliminary model or version of a product/service used to test ideas before full production.
- Types: Low-fidelity (sketches, paper models), mid-fidelity (click-throughs), high-fidelity (working product). ([frog, part of Capgemini Invent](#))

### Purpose in design thinking:

- Helps quickly test assumptions
- Encourages failure early and learning
- Visualises story/scenario for users/stakeholders

**Example:** Prototype of your notes portal: clickable mobile mock-up, test with students at 11 pm scenario, capture feedback.

**Exam tip:** Define prototyping, list types, explain why it's important in scenario/story – and mention a firm like frog to contextualize real-world practice.

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## 3. Assess Developer and User Perspectives for Bias – Apply Frameworks to Strengthen Communication – Sustain a Culture of Innovation

### 3.1 Developer vs User Perspectives & Bias

#### Definition:

Developer perspective refers to what the design/development team *thinks* users need; user perspective refers to actual user behaviours, needs, contexts. Bias occurs when developers assume what users need without evidence (designer bias, confirmation bias).

#### Why this matters:

Design thinking aims to bridge gap between developer assumptions and user reality by using diagrams/maps, user research, prototyping. Bias reduces usability and relevance of solutions.

### **How to assess & reduce bias:**

- Regular user testing & feedback loops
  - Use empathy maps, journey maps (user perspective)
  - Cross-functional teams (diverse backgrounds)
  - Use evaluation criteria: desirability, feasibility, viability
- Example:** Developer assumes students prefer desktop access; actual users (mobile-only) show mobile portal usage. Without checking, developer bias would mis-align solution.

## **3.2 Apply Frameworks to Strengthen Communication**

### **Frameworks:**

- Use design thinking frameworks (Empathize → Define → Ideate...) to structure team communication.
- Use narrative/storytelling frameworks to align stakeholders around user value.
- Use mapping tools (empathy, journey, mind maps) as visual language across disciplines.

### **Purpose:**

- Visuals make complex ideas easy to share and align.
- Shared frameworks enable teams (design, dev, business, user) to speak same language.

**Example:** At your portal project, the team uses a journey map to show user pain points – design, dev and business all review it, enabling aligned understanding.

**Exam tip:** When asked “How do frameworks strengthen communication?”, mention visual tools, shared language, cross-team alignment, reduce misunderstanding.

## **3.3 Sustain a Culture of Innovation**

### **Definition:**

Innovation culture refers to organizational environment where creative thinking, experimentation, prototyping, continuous improvement and

risk-taking are encouraged and supported.

**Key features:**

- Psychological safety (teams safe to fail)
- Cross-disciplinary collaboration
- Continuous learning and iteration
- Use of design thinking processes embedded in daily work
- Leadership support, resources for prototyping

**Approaches:**

- Conduct regular design thinking workshops and prototyping sessions
- Recognise and reward innovative behaviours
- Maintain visual artefacts (maps, diagrams) as live references
- Encourage story-telling of failures & learnings

**Example:** A small educational startup might have weekly “innovation hour” where team ideates on portal improvements, prototypes mini-features, tests with students.

**Exam tip:** Define innovation culture, list 4-5 characteristics, explain how to build it, connect to sustaining design thinking in organization.

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## 4. Exercises and Case-Based Discussions

### 4.1 Suggested Exercises

- **Exercise A – Map Workshop:** Teams build empathy map for a user persona (e.g., night-studying student). Then build journey map of their study session, identifying pain points & emotion highs/lows.
- **Exercise B – Scenario Planning & Prototyping:** Define a scenario (e.g., low-internet rural student accessing portal). Story-board scenario. Build rough prototype (paper/mobile). Test and gather feedback.
- **Exercise C – Developer vs User Bias Audit:** Developers list assumptions about users. Conduct quick user

interview/observation. Compare assumptions vs findings. Build an affinity diagram of mis-alignments.

- **Exercise D – Innovation Culture Simulation:** Role-play design sprint. Teams ideate improvements, prototype, present story to leadership role-play, receive feedback on culture support.

## 4.2 Case-Based Discussion

### Case Example – Design Thinking at frog design:

frog design uses scenario planning, story-driven innovation, rapid prototyping and organisational mindset shifts to bring design thinking into large enterprises. ([frog, part of Capgemini Invent](#))

### Discussion points:

- How did frog use story-telling and scenario planning to frame future innovation?
  - What diagrams/maps did they use to align teams and users?
  - How did they address developer-user bias?
  - What elements of innovation culture supported sustained change?
- Potential exam question:** “Analyse how a design firm like frog design sustains a culture of innovation using maps, storytelling and communication frameworks.”

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## 5. Summary & Key Takeaways

- **Diagrams/Maps (Empathy Map, Affinity Diagram, Mind Map, Journey Map):** Essential visual tools in design thinking for understanding users, synthesising data, ideating and aligning teams.
- **Storytelling & Scenario Planning & Prototyping:** Use narrative and future-oriented scenarios to explore possibilities; prototyping to test ideas quickly.
- **Developer vs User Perspectives & Bias:** Recognising and bridging the gap is critical for valuable innovation.
- **Frameworks for Communication & Innovation Culture:** Shared maps and story-boards enhance team alignment; embedding design thinking into culture sustains long-term innovation.

- **Exercises & Case Studies:** Practical application consolidates learning and readies students for real-world design thinking use.

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