Design Thinking: Unit 4 - Human-Centered Design & Environment

Outline:

- Human Centered Design
- Service Development Process & Lifecycle
- Product vs Services, Innovation in Services
- Service Experience Lifecycle
- Human-Computer Interaction
- Usability Engineering & Heuristic Evaluation
- Design for the Environment (DFE) and related topics

Introduction:

- HCD focuses on user needs and behaviors.
- DFE focuses on minimizing environmental impact.
- Objective: merge user-friendly design with sustainability.

Human-Centered Design (HCD):

- Definition: approach centering on end-users' needs, behaviors, limitations.
- Principles: Empathy, iterative testing, user involvement.
- Goals: Enhance usability, satisfaction, and innovation.

Service Development Process:

1. Concept: Idea creation and user needs.
2. Design: Prototyping, testing, refinement.
3. Implementation: Full deployment.
4. Evaluation: Ongoing feedback and improvement.

Product vs Services:

- Products: Tangible, static, mass-produced (e.g., smartphones).
- Services: Intangible, dynamic, co-produced (e.g., healthcare).

Innovation in Services:

- Improving service delivery via technology/process.
- Examples: Netflix/Spotify streaming; Apple Pay mobile payments.

Service Experience Lifecycle:

- Pre-Service: Awareness and marketing.
- Service Encounter: Booking, interaction, usage.
- Post-Service: Feedback and evaluation.

Human-Computer Interaction (HCI):

- Study of user-tech interaction.
- Importance: Usability and user experience.
- Examples: website and touchscreen interface design.

Usability Engineering & Heuristic Evaluation:

- Usability engineering: efficiency, learnability, satisfaction.
- Heuristic evaluation: expert review using principles like visibility of status, match to real world, user control.

Design for the Environment (DFE):

- Definition: Reduce environmental impacts across product/service lifecycle.
- Focus: Waste reduction, resource optimization, carbon footprint minimization.

Environmental Design Considerations:

- Materials: renewable, recyclable.
- Energy: efficient production and usage.
- Durability, repairability, end-of-life management.

Key Environmental Issues:

- Climate change, resource depletion, pollution, waste management.

Sustainable Development:

- Meeting present needs without compromising future generations.
- Principles: economic, environmental, social equity.

Green Design Principles:

- Process: minimize manufacturing waste/energy.
- Product: durable, recyclable, low-emission.

Methods for DFE:

- Qualitative: expert judgement, focus groups, workshops.
- Quantitative: Life Cycle Assessment (LCA), Environmental Impact Assessment (EIA).

Design for Disassembly:

- Products built for easy disassembly and recycling.
- Benefits: waste reduction, extended lifespan.

Design for Recyclability:

- Use of recyclable materials, simplified assembly.
- Avoid complex mixed materials.

Design for Energy Efficiency:

- Energy-efficient components and processes.
- Examples: LED lighting, efficient appliances.

The 4Rs (Reduction, Reuse, Recycling, Recovery):

- Reduce resource use.
- Reuse products/materials.
- Recycle materials.
- Recover energy/materials from waste.

Conclusion:

- Integrating HCD and DFE yields user-centered, sustainable solutions.