ATLAS SKILLTECH UNIVERSITY

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COURSE NAME

PRODUCT AND SERVICE DESIGN

COURSE CODE

OL BBA PE 06

CREDITS: 2

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Edition: 2025 (Restricted Circulation)
Published by: ATLAS SkillTech University, Mumbai

Detailed Syllabus

Block No.	Block Name	Unit No.	Unit Name
1	**Foundations of Product & Service Design**	1	Foundations of Product & Service Design
		2	Design Research & Problem Theory
2	**Service Design & Prototyping**	3	Understanding Service Ecosystems
		4	Prototyping, Blueprinting & Testing
3	**Design Communication & Future Trends**	5	Storytelling, Pitching & Impact Design
		6	Emerging Trends in Product & Service Design

Course Name: Product and Service Design

Course Code: OL BBA PE 06

Credits: 2

<table>
<tr><th colspan="3">Teaching Scheme</th><th colspan="2">Evaluation Scheme (100 Marks)</th></tr>
<tr><td>Classroom Session (Online)</td><td>Practical / Group Work</td><td>Tutorials</td><td>Internal Assessment (IA)</td><td>Term End Examination</td></tr>
<tr><td>6+1= 7 Sessions</td><td>-</td><td>-</td><td>30% (30 Marks)</td><td>70% (70 Marks)</td></tr>
<tr><td rowspan="2">Assessment Pattern:</td><td colspan="2">Internal</td><td colspan="2" rowspan="2">Term End Examination</td></tr>
<tr><td>Assessment I</td><td>Assessment II</td></tr>
<tr><td>Marks</td><td>15</td><td>15</td><td colspan="2">70</td></tr>
<tr><td>Type</td><td>MCQ</td><td>MCQ</td><td colspan="2">MCQ – 49 Marks,
Descriptive questions – 21 Marks (7 Marks * 3 Questions)</td></tr>
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Course Description:

This course provides a comprehensive methodology for designing both physical products and intangible services, emphasizing Human-Centred Design Principles and the Design Thinking framework. It covers the foundational concepts, distinguishing between product and service design, and introduces core tools like the Value Proposition Canvas (VPC) and Service Blueprinting. The course explores the entire design lifecycle, from defining a problem through contextual inquiry, understanding complex Service Ecosystems, and employing ideation techniques, to the practical skills of prototyping, testing, packaging, and leveraging business storytelling for long-term impact. Finally, it addresses emerging trends such as AI-First Products and Ethical/Circular Design principles.

Course Objectives:

1. To introduce the foundations of design, distinguishing between Product vs. Service Design, emphasizing the Lifecycle Thinking and Human-Centred Design Principles.
2. To familiarize students with the core frameworks like Design Thinking, the Double Diamond Framework, Value Proposition Canvas (VPC), Service Blueprinting, and Business Model Canvas (BMC).
3. To teach methods for Design Research, focusing on Problem Theory, Theory of Change (ToC), and conducting Contextual Inquiry and Ethnographic Research to synthesize user insights.
4. To explain the concept of Service Ecosystems, including Stakeholder Mapping, Touchpoint Mapping, and the difference between Frontstage vs. Backstage Interactions.
5. To develop practical skills in Prototyping, Service Blueprinting, Packaging, and Usability Testing for refinement cycles.
6. To cover the strategic use of Business Storytelling, Emotional Design, and Pitching for Impact, and to explore emerging trends like Designing for AI-First Products, Sustainability, and Ethical Design.

Course Outcomes:

1. CO1: Students will be able to recall and state the difference between Product and Service Design and identify the key principles of Human-Centred Design.
2. CO2: Students will be able to explain the Double Diamond Framework and interpret the different components of the Value Proposition Canvas and Service Blueprinting.
3. CO3: Students will be able to apply Contextual Inquiry techniques for design research and demonstrate proficiency in creating a basic Service Blueprint.
4. CO4: Students will be able to analyze a service context by performing Stakeholder and Touchpoint Mapping and differentiate between frontstage and backstage interactions.
5. CO5: Students will be able to design a product or service concept by integrating ideation techniques, prototyping, and business storytelling for pitching and impact.
6. CO6: Students will be able to critique design approaches based on Ethical Design and Sustainability/Circular Design Principles and evaluate the design challenges of AI-First products.

Pedagogy: Online Class, Discussion Forum, Case Studies, Quiz etc

Textbook: Self Learning Material (SLM) From Atlas SkillTech University

Reference Book:

1. Stickdorn, M., Hormess, M. E., Lawrence, A., & Schneider, J. (2018). *This is service design doing: Applying service design thinking in the real world*. O'Reilly Media.
2. Kelley, T., & Kelley, D. (2013). *Creative confidence: Unleashing the creative potential within us all*. Crown Business.
3. Verganti, R. (2017). *Overcrowding: Why innovation is no longer about technology*. MIT Press.

Course Details:

Unit No.	Unit Description
1	Foundations of Product & Service Design: Product vs Service Design, Lifecycle Thinking & Business Impact, Human-Centred Design Principles, Case Discussion, Design Thinking, Double Diamond Framework, Value Proposition Canvas (VPC), Service Blueprinting Basics, Business Model Canvas (BMC).
2	Design Research & Problem Theory: Defining Problems Worth Solving, Problem Theory and Theory of Change (ToC), Contextual Inquiry & Ethnographic Research, Differentiation & Retention Models, Conducting Field Research, Synthesising User Insights.
3	Understanding Service Ecosystems: Stakeholder Mapping, Touchpoint Mapping, Frontstage vs. Backstage Interactions, Platform Thinking, Service System Maps, Ideation Techniques, AI-Assisted Ideation Tools.
4	Prototyping, Blueprinting & Testing: Prototyping Basics, Service Blueprinting, Packaging and Presentation, Usability Testing, Feedback and Refinement Cycles.
5	Prototyping, Blueprinting & Testing: Business Storytelling, Emotional Design in Narratives, Pitching for Impact, Designing for Long-Term Impact.
6	Emerging Trends in Product & Service Design: Designing for AI-First Products & Services, Sustainability & Circular Design Principles, Ethical Design & Inclusivity, Future of Ecosystems.

POCO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO 1	2	-	1	-	2	-	1	-	-	-	1	2	1
CO 2	2	1	1	-	2	-	2	-	-	-	2	3	-
CO 3	1	2	2	1	2	-	2	2	-	-	3	3	-
CO 4	2	2	1	1	1	-	2	-	-	-	3	3	-
CO 5	2	2	1	-	3	-	3	-	-	-	3	3	-
CO 6	1	1	3	-	3	-	1	-	-	-	2	2	3

Unit 1: Foundations of Product & Service Design

Learning Objectives

1. **Differentiate** between product design and service design in terms of outcomes, user interaction, and processes.
2. **Apply** lifecycle thinking to assess the long-term business and environmental impact of design decisions.
3. **Explain** the core principles of human-centred design and their role in solving real-world problems.
4. **Analyze** real-world case studies to identify best practices in service and product design.
5. **Understand** the iterative stages of design thinking and how they support innovation.
6. **Utilize** frameworks like the Double Diamond, VPC, and BMC to map and improve design processes.
7. **Create** a basic service blueprint and business model canvas to visualize user journeys and value delivery.

Content

1.0 Introductory Caselet

Café Nova's Crossroads: Designing for Taste or Experience?

Background:

Café Nova is a rapidly expanding chain of urban boutique coffee shops operating in multiple metropolitan cities. Known for its premium blends and minimalist aesthetics, the brand has attracted a loyal customer base of working professionals and young adults. However, as competition intensifies, Café Nova's leadership is reconsidering its strategy.

Recent customer feedback reveals a divide: while some patrons appreciate the quality of the coffee, others emphasize the importance of the ambience, friendly baristas, and seamless mobile app ordering. Management is now faced with a critical decision—should the company invest further in **product innovation** (e.g., sourcing rare beans, new brewing techniques, sustainable packaging) or enhance the **service experience** (e.g., training staff in service design, upgrading store layouts, expanding app functionality)?

Café Nova's design team is tasked with evaluating both pathways, considering the company's brand values, long-term growth, and customer satisfaction metrics.

Critical Thinking Question:

As a design consultant, how would you guide Café Nova in balancing product and service innovation? What frameworks or tools could help identify customer priorities and align them with business goals?

1.1 Product vs Service Design

Design plays a crucial role in how businesses create value for their customers. Whether the focus is on a physical product, a digital tool, or an intangible service, the principles of design help ensure that the offering meets user needs effectively. However, product design and service design are distinct disciplines with different approaches, goals, and outcomes.

The following sections provide detailed explanations of both concepts and how they relate to each other.

1.1.1 Definition of Product Design

Product design is the strategic and creative process of imagining, planning, and developing a product—either physical or digital—that solves a specific problem or fulfills a particular need of its target users. It encompasses the entire journey from initial concept to final production, involving research, ideation, prototyping, testing, and refinement. The discipline draws from fields such as engineering, aesthetics, psychology, and human-centered design, aiming to deliver solutions that are functional, visually appealing, and user-friendly.

Product design is inherently **user-centered**, meaning that the wants, needs, and limitations of the end user are considered at every stage of the design process. A successful product design aligns user satisfaction with technical feasibility and business viability.

Key Aspects of Product Design

Product designers typically focus on several core aspects, including:

- **Usability**: How intuitive and efficient the product is to use.
- **Functionality**: Whether the product performs its intended task reliably.
- **Aesthetics**: The visual and sensory appeal of the product.
- **Ergonomics**: The comfort, safety, and ease of interaction with the product.
- **Sustainability**: The environmental impact of the materials and manufacturing processes used.
- **Cost-effectiveness**: Delivering value within constraints of budget and production scalability.
- **Feasibility**: Ensuring that the design can be realistically produced with available technology and resources.

Figure 1.1

Categories of Product Design

Product design can be broadly classified into three main categories:

1. **Industrial/Physical Product Design**: Involves designing tangible products such as electronics, appliances, tools, and consumer goods.
2. **Digital Product Design**: Focuses on software interfaces and user experiences for mobile applications, websites, and digital platforms.
3. **Service and System Design**: Encompasses the planning of workflows, processes, and systems in service-based environments (e.g., transportation systems, healthcare services).

Examples of Product Design

- A smartphone that integrates sleek aesthetics with ergonomic features and high performance.
- A reusable water bottle designed for portability, thermal insulation, and durability.
- A user interface for a mobile application optimized for clarity, accessibility, and smooth navigation.
- A medical device engineered to be safe, intuitive, and cost-effective.

Tools and Techniques in Product Design

Modern product designers use a variety of tools to support the design process:

- **Computer-Aided Design (CAD)** software for detailed modeling and simulations.
- **Wireframes and Mockups** to plan and visualize interface layouts.
- **Prototyping** using 3D printing or digital tools to test form and function.
- **User Testing and Feedback Loops** to refine the design based on real-world use.

Importance of Product Design

Effective product design plays a critical role in enhancing user experience, differentiating a product in the marketplace, and contributing to a company's success. It serves as a bridge between technological innovation and human needs, ensuring that solutions are both viable and valuable. Moreover, well-designed products often result in increased customer satisfaction, reduced production costs, and stronger brand identity.

1.1.2 Definition of Service Design

Service design is a multidisciplinary approach that focuses on the **planning, organizing, and optimizing** various components—people, infrastructure, communication, and materials—to enhance the **quality, efficiency, and user experience** of a service. The ultimate aim is to create services that are **useful, usable, desirable** for customers, while being **efficient, scalable, and effective** from the organization's perspective.

Unlike product design, which deals primarily with tangible items, **service design is centered on experiences and interactions**. It looks at services as holistic systems, including both the visible aspects that users interact with and the behind-the-scenes processes that make these interactions possible.

Key Characteristics of Service Design

Service design is rooted in human-centered thinking and systems thinking. Some of its essential characteristics include:

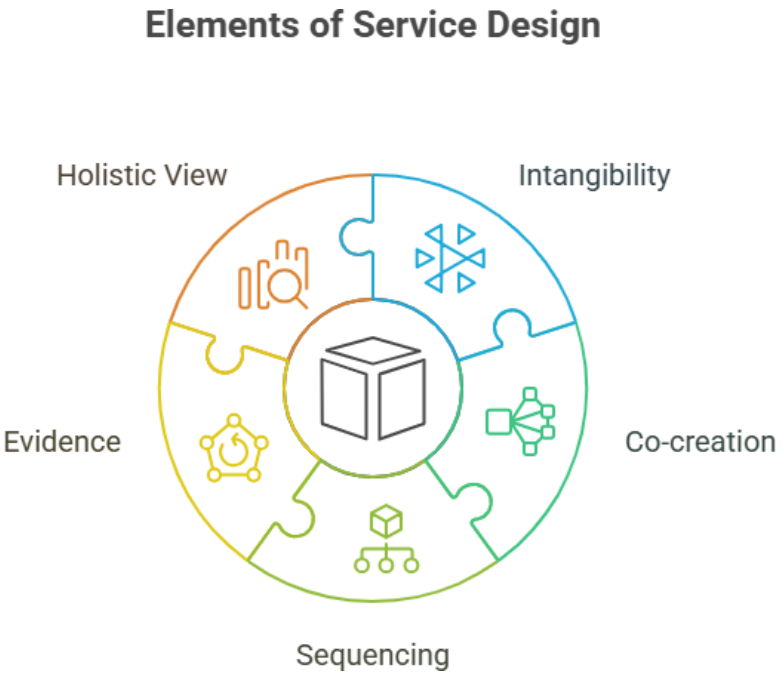

Figure 1.2

- **Intangibility**: Services are not physical objects but experiences, actions, or performances.
- **Co-creation**: Involving users, stakeholders, and service providers in the design process to ensure relevance and usability.
- **Sequencing**: Services unfold over time, often involving multiple steps or stages in a customer journey.
- **Evidence**: While services are intangible, they often involve tangible artifacts (e.g., receipts, emails, interfaces) that serve as evidence of the interaction.
- **Holistic View**: Service design considers the full ecosystem—frontstage (user-facing elements) and backstage (support systems, staff, and technology).

Key Aspects of Service Design

Service designers focus on several core components that shape the overall experience:

- **Customer Journey Mapping**: A visual representation of the user's experience across all stages of interaction, identifying pain points and opportunities for improvement.

- **Touchpoints**: Specific points of interaction between users and the service (e.g., a mobile app, a service desk, email communication).
- **Backstage Processes**: The internal workflows, policies, and staff actions that support the service but remain invisible to the customer.
- **User Personas**: Fictional profiles based on real user research that represent different customer segments and their needs.
- **Service Blueprints**: Detailed diagrams that map out service delivery across frontstage and backstage, helping identify dependencies and bottlenecks.

Importance of Service Design

Service design plays a critical role in delivering **coherent, consistent, and satisfying experiences** across various channels and touchpoints. In increasingly competitive and service-driven economies, organizations rely on well-designed services to:

- Improve **customer satisfaction** and loyalty
- Reduce **operational inefficiencies**
- Enhance **employee experience** and engagement
- Foster **innovation** through better understanding of customer needs
- Ensure **inclusive and accessible** service delivery

Examples of Service Design Applications

- **Airport Check-In Process**: Streamlining the user flow from baggage drop-off to security checks by reducing waiting time and providing clearer signage.
- **Hospital Patient Journey**: Improving how patients navigate appointments, diagnostics, and discharge processes through better scheduling and communication systems.
- **Retail Customer Support**: Designing a multichannel support system that allows customers to easily switch between chat, phone, and email while maintaining consistent service quality.
- **Banking Services**: Redesigning online and branch-based experiences to ensure smooth transitions between digital and physical banking.

- **Public Transportation Systems**: Coordinating schedules, mobile apps, signage, and ticketing in a way that improves accessibility and user navigation.

Tools and Techniques in Service Design

To achieve user-centered and efficient service delivery, service designers employ various tools and methods:

Tool	Purpose
Personas	Represent target user types, their goals, and behaviors
Journey Maps	Visualize user experience across all service stages
Service Blueprints	Map frontstage and backstage elements of a service
Stakeholder Maps	Identify all actors involved and their roles
Scenario Building	Explore different use cases and outcomes
Prototyping	Test service concepts before full-scale implementation
Workshops and Co-Creation Sessions	Involve stakeholders in ideation and problem-solving

Service design continues to gain importance across industries, especially in healthcare, transportation, finance, education, and digital services, where user expectations are high and competition is fierce. A well-designed service not only enhances the user experience but also creates measurable value for the service provider.

1.1.3 Key Differences Between Products and Services

Although both product and service design aim to meet user needs, they differ in several fundamental ways:

Aspect	Product Design	Service Design
Tangibility	Deals with physical or digital items	Deals with intangible experiences
Deliverable	A final product (e.g., phone, app)	A process or experience (e.g., customer support)

User Interaction	User interacts with the object or interface	User interacts with people, systems, and environments
Ownership	User owns the product	User accesses or consumes the service
Consistency	Product is usually consistent once produced	Service may vary depending on people or time
Production and Delivery	Produced before use	Delivered at the same time as consumption

For example, buying a phone is a product experience, while calling customer support after purchase is a service experience.

1.1.4 Overlaps and Integration of Product & Service Design

In the contemporary business landscape, the **lines between product design and service design are increasingly blurred**. As customer expectations grow more complex, organizations are no longer delivering standalone products or services—they are offering **integrated solutions** that combine both. This convergence reflects a shift toward **experience-driven value creation**, where the focus is on the **entire customer journey**, not just isolated touchpoints.

This integrated approach is especially common in **technology-driven and digitally enabled industries**, where physical products are often inseparable from the services that support them. The result is a **Product-Service System (PSS)**—a cohesive offering in which products and services are co-designed to provide added value.

Understanding the Integration

Product and service design traditionally had distinct roles:

- **Product design** focused on the creation of physical or digital artifacts.
- **Service design** centered on user experiences and the systems that deliver them.

However, in real-world applications, these roles frequently **intersect**. Effective integration ensures that both components—tangible and intangible—**function harmoniously** to meet user needs across all stages of interaction, including pre-use, use, and post-use.

Key Drivers of Integration

- **Customer-Centric Thinking**: Modern consumers expect seamless and consistent experiences.

- **Digital Transformation**: Technology enables continuous interaction between users and products/services (e.g., apps, smart devices).
- **Subscription and Platform Models**: Business models now rely on ongoing services tied to physical or digital products.
- **Sustainability Goals**: PSS promotes responsible consumption by emphasizing performance over ownership.

Examples of Product-Service Integration

Product	Integrated Service	Description
Fitness Tracker (e.g., Fitbit)	Mobile app with health analytics, coaching, and social sharing	Enhances user engagement and adds value beyond the device itself
Smart Car (e.g., Tesla)	Over-the-air updates, roadside assistance, navigation, and autopilot features	Combines cutting-edge technology with personalized service support
E-Commerce Platform (e.g., Amazon)	Delivery, tracking, customer support, returns, and Prime services	Product and service are part of a single ecosystem
Consumer Electronics (e.g., Apple devices)	iCloud storage, AppleCare, and device syncing	Seamless experience through integration of hardware, software, and services
Home Appliances (e.g., smart refrigerators)	Mobile app control, energy monitoring, customer support	Enables better management and servicing of the product

The Role of Product-Service Systems (PSS)

A **Product-Service System (PSS)** refers to a business model or design framework where products and services are **developed in unison** to fulfill a specific customer need. The goal is to shift from product ownership to **access and usability**, providing continuous value through services associated with the product.

Types of PSS:

1. **Product-Oriented**: Traditional product with additional service options (e.g., maintenance plans).

2. **Use-Oriented**: Product remains company-owned, user accesses via leasing or sharing (e.g., car-sharing services).
3. **Result-Oriented**: Customer pays for the outcome or result, not the product itself (e.g., managed printing services).

Benefits of Integration

- **Improved User Experience**: Seamless interaction across product and service touchpoints.
- **Greater Customer Loyalty**: Ongoing engagement through services promotes retention.
- **Competitive Advantage**: Integrated offerings are harder to replicate, providing market differentiation.
- **Sustainability and Efficiency**: Encourages reuse, repair, and performance-based consumption.
- **Scalable Business Models**: Enables recurring revenue through subscription and platform strategies.

Challenges in Integration

- **Cross-Functional Collaboration**: Requires coordination between design, engineering, marketing, and customer service teams.
- **Complexity in Execution**: Designing for both tangible and intangible elements increases design complexity.
- **Consistent Branding**: Ensuring that product and service align with brand values and user expectations.

Designing for the Whole User Journey

Effective integration relies on understanding the **complete user journey**—from discovery and purchase to usage, support, and renewal. Designers must map out each stage and identify where product and service intersect to ensure consistency and value delivery.

Tools commonly used:

- **Customer Journey Maps**
- **Touchpoint Matrices**
- **Service Blueprints**

- **Experience Prototypes**
- **Cross-disciplinary Design Sprints**

1.2 Lifecycle Thinking & Business Impact

Lifecycle thinking is a strategic approach that considers the entire lifespan of a product or service—from initial design to end-of-life. This perspective helps businesses make informed decisions that balance profitability, customer value, and sustainability. By understanding how a product or service evolves over time, organizations can reduce waste, manage costs, and design more resilient and responsible systems.

1.2.1 Concept of Lifecycle Thinking

Lifecycle thinking is a systematic, holistic approach to understanding and evaluating the **environmental, economic, and social impacts** of a product, service, or system **throughout its entire lifecycle**. Instead of focusing on a single stage—such as manufacturing or consumption—this method considers all phases from **cradle to grave**, or increasingly, from **cradle to cradle** in circular economy models.

The lifecycle typically includes:

1. **Raw material extraction**
2. **Design and development**
3. **Manufacturing and production**
4. **Packaging and distribution**
5. **Use and maintenance**
6. **End-of-life disposal, recycling, or repurposing**

Lifecycle thinking encourages decision-makers to **anticipate and evaluate impacts** before they occur, thereby enabling more sustainable, cost-effective, and socially responsible strategies.

Key Aspects of Lifecycle Thinking

Lifecycle thinking expands the scope of analysis to include:

- **Environmental Outcomes**: Energy use, carbon emissions, water consumption, material depletion, waste generation, pollution.
- **Economic Costs**: Total cost of ownership, maintenance, logistics, product recalls, resource efficiency.
- **Social Impacts**: Labor conditions, community impact, user safety, accessibility, customer satisfaction.

Importance of Lifecycle Thinking

Lifecycle thinking is essential in a variety of fields and applications due to its ability to reveal **hidden or long-term effects** that may be overlooked in traditional linear planning models. It is especially relevant in:

- **Product Design and Development**: Helps design products that are durable, repairable, and recyclable.
- **Sustainability Strategy**: Identifies opportunities to reduce environmental impact across the supply chain.
- **Policy and Regulation**: Supports compliance with environmental regulations such as Extended Producer Responsibility (EPR).
- **Corporate Social Responsibility (CSR)**: Aligns products and services with ethical labor and sourcing practices.
- **Procurement and Investment**: Informs responsible sourcing decisions and lifecycle cost evaluations.

Lifecycle Stages and Examples of Impact

Lifecycle Stage	**Example of Impact**
Raw Material Extraction	Deforestation, energy consumption, biodiversity loss

Manufacturing	Emissions, toxic byproducts, labor practices
Transportation and Distribution	Fuel use, carbon footprint, packaging waste
Use Phase	Energy efficiency, maintenance needs, user safety
End-of-Life	Waste disposal, recycling potential, landfill impact

Tools and Methodologies

Several tools and frameworks support lifecycle thinking, including:

- **Life Cycle Assessment (LCA)**: A structured method for quantifying the environmental impact of each lifecycle stage.
- **Carbon Footprinting**: Measures the total greenhouse gas emissions associated with a product or service.
- **Material Flow Analysis (MFA)**: Tracks the flow of materials through a system to identify inefficiencies or environmental risks.
- **Lifecycle Costing (LCC)**: Evaluates the total cost of ownership, including acquisition, operation, maintenance, and disposal.
- **Social Lifecycle Assessment (S-LCA)**: Focuses on human and social impacts throughout the lifecycle.

Benefits of Lifecycle Thinking

- **Informed Decision-Making**: Enables holistic evaluation of trade-offs across environmental, economic, and social dimensions.
- **Sustainable Innovation**: Encourages development of products and services with lower overall impact.
- **Regulatory Compliance**: Facilitates alignment with environmental laws and international standards (e.g., ISO 14040).
- **Risk Management**: Identifies risks early in the lifecycle that could affect performance or reputation.

- **Competitive Advantage**: Enhances brand image, customer trust, and market positioning through responsible design.

Real-World Application Example

- **Automotive Industry**: Lifecycle thinking is applied to evaluate vehicle emissions not only during use (tailpipe emissions) but also during manufacturing (energy-intensive processes), material sourcing (steel, lithium for batteries), and end-of-life recycling.
- **Electronics Industry**: Smartphone manufacturers assess material choices, energy usage during charging, and recyclability of components to minimize impact across the product lifecycle.
- **Construction**: Building materials are assessed based on their lifecycle—from raw material extraction (e.g., quarrying cement) to demolition and recycling or landfill impact.

1.2.2 Stages of Product and Service Lifecycle

Products and services typically go through several identifiable stages. While the exact model may vary depending on industry, the following are common phases:

Stage	Description
1. Design & Development	Conceptualizing the idea, research, prototyping, and planning.
2. Production/Launch	Manufacturing (for products) or implementation (for services).
3. Market Introduction	Bringing the offering to customers; often involves marketing and sales.
4. Growth	Demand increases; processes scale up to meet market needs.
5. Maturity	Sales level off; competition is high; emphasis on efficiency.
6. Decline	Use or demand decreases; the offering may be phased out or redesigned.
7. End-of-Life/Retirement	Product is disposed of, recycled, or replaced; services are redesigned or discontinued.

For services, additional attention is paid to **touchpoints** and **process updates**, as service delivery may evolve more dynamically than physical products.

1.2.3 Business Implications of Lifecycle Management

Lifecycle management has significant implications for business strategy, operations, and customer relationships. Key impacts include:

1. **Cost Optimization**: Understanding lifecycle costs (initial, operational, and disposal) helps manage budgets more effectively.
2. **Innovation Planning**: Anticipating product or service maturity enables timely innovation or redesign before decline sets in.
3. **Risk Management**: Identifying potential lifecycle issues (e.g., obsolescence, regulatory changes) reduces operational risks.
4. **Customer Retention**: Designing services that adapt over time increases long-term customer engagement.
5. **Revenue Models**: Lifecycle thinking can inform subscription models, maintenance contracts, and upgrades to extend value.
6. **Asset Utilization**: For capital-intensive products (e.g., machinery), lifecycle management improves uptime and return on investment.
7. **Brand Image**: Companies that extend lifecycle value responsibly (e.g., through repairs or recycling) often build a stronger brand reputation.

1.2.4 Sustainability and Circular Economy Considerations

Lifecycle thinking is closely linked to **sustainability** and the principles of the **circular economy**. Instead of the traditional linear model of "take–make–dispose", the circular model aims to **minimize waste** and **maximize value reuse** at every stage.

Key sustainability considerations include:

- **Design for Durability**: Products and services should be designed to last longer and be easily maintained or upgraded.
- **Resource Efficiency**: Using fewer materials and less energy during production and operation reduces environmental impact.
- **End-of-Life Planning**: Considering how products can be reused, recycled, or safely disposed of when no longer needed.
- **Service Substitution**: Replacing physical ownership with services (e.g., leasing, sharing models) can reduce material usage.

Examples:

- A company redesigning its packaging to be biodegradable reduces landfill waste.
- A software provider offering updates and modular features reduces the need for new purchases.

- A clothing brand creating a return-and-recycle program for worn garments supports circular economy goals.

Lifecycle thinking encourages organizations to evaluate **environmental, social, and economic outcomes** over the long term, aligning business success with global sustainability objectives.

1.3 Human-Centred Design Principles

Human-Centred Design (HCD) is an approach to problem-solving and innovation that prioritises the needs, preferences, and behaviours of the people for whom a product or service is being designed. Rather than starting with technical features or business objectives, HCD begins with understanding the **human perspective**, and incorporates that understanding throughout the design process.

This methodology is grounded in empathy, collaboration, and iteration, ensuring that solutions are not only effective, but also meaningful and usable for real users.

1.3.1 Importance of User Research, Persona and Empathy

User research is the foundation of human-centred design. It involves collecting insights about the target users' experiences, motivations, and challenges through methods such as interviews, observations, surveys, and usability testing.

Personas are fictional characters created based on real data from user research. They represent typical users of the product or service, helping designers focus on specific needs, behaviours, and goals during the development process.

Empathy is the ability to understand and share the feelings of others. In HCD, empathy helps designers see the world from the user's point of view, uncovering hidden needs and pain points that might otherwise go unnoticed.

These three elements help teams:

- Avoid assumptions about users
- Stay focused on solving real problems
- Communicate user insights across the team

Example: A healthcare app team may create a persona representing an elderly user with limited vision and low digital literacy. This helps the team design features that are more inclusive and accessible.

1.3.2 Iterative Prototyping and Feedback Loops

In human-centred design, solutions are rarely built all at once. Instead, designers use **prototyping**—creating simple versions or models of the product or service—to explore ideas and test their effectiveness early in the process.

Iterative prototyping means that designs are built, tested, and improved in multiple cycles. Each iteration incorporates **feedback** from real users, which helps refine the solution and avoid costly mistakes later in development.

Key benefits of this approach:

- Reduces risk by identifying problems early
- Encourages creativity and experimentation
- Builds user trust through co-creation

Feedback loops can be formal (e.g., usability testing sessions) or informal (e.g., observing user behaviour). They are essential for ensuring that the final design remains aligned with user needs.

Example: A public transport app may go through several prototypes before arriving at a user-friendly map interface that is easy to read and navigate under time pressure.

1.3.3 Usability, Accessibility, and Inclusivity

A human-centred product or service must be usable, accessible, and inclusive:

- **Usability** refers to how easily and effectively users can interact with a system. It focuses on clarity, simplicity, efficiency, and user satisfaction.
- **Accessibility** ensures that people with disabilities can use the product or service. This includes visual, auditory, motor, and cognitive impairments. It may involve features such as screen readers, voice commands, or high-contrast modes.
- **Inclusivity** goes beyond accessibility by designing for **diversity**. It considers a wide range of users across cultures, ages, languages, socioeconomic backgrounds, and abilities.

Designing with these principles in mind:

- Broadens the user base
- Promotes fairness and equity

- Reduces legal and reputational risks

Example: An inclusive banking app may support multiple languages, simple onboarding, and accessibility features for visually impaired users.

1.3.4 Balancing User Needs with Business Goals

While human-centred design puts users first, it must also align with **business objectives** such as profitability, scalability, and brand positioning. A successful design balances **user desirability** with **technical feasibility** and **business viability**.

This balance is achieved by:

- Prioritising high-impact user needs that align with market demand
- Using data to validate assumptions about both user behaviour and business outcomes
- Engaging cross-functional teams (e.g., marketing, engineering, finance) early in the design process

Designers must navigate trade-offs—such as simplifying a feature to improve usability, even if it means delaying a product launch. By staying focused on both human and business perspectives, they create solutions that are sustainable in the long term.

Example: A ride-sharing app might limit advanced features for first-time users to reduce confusion, while offering premium options to power users through account upgrades. This approach satisfies different user segments while supporting revenue goals.

1.4 Case Discussion

This section explores real-world examples of **product design** and **service design** through two leading companies—Apple and Swiggy. Each case illustrates how human-centred design principles and lifecycle thinking contribute to innovation, competitive advantage, and customer satisfaction.

1.4.1 Product Design Case: iPhone (Apple's Human-Centred Product Innovation)

Apple's iPhone is widely regarded as a benchmark in product design, not only for its technological features but also for its **human-centred approach**. Since its first launch in 2007, the iPhone has set new standards for usability, aesthetics, and seamless integration of hardware and software.

Key Design Elements:

- **User Interface Simplicity:** Apple prioritised ease of use by replacing physical keyboards with a touch-based interface. The intuitive design reduced the learning curve for first-time users.
- **Minimalist Aesthetics:** The product design emphasised clean lines, symmetry, and high-quality materials. These visual and tactile elements contributed to a strong emotional connection with users.
- **Integrated Ecosystem:** iPhone was designed not as a standalone product but as part of a larger ecosystem (iOS, App Store, iCloud), which enhanced the user experience across devices.
- **Accessibility Features:** Apple embedded features like VoiceOver (screen reader), haptic feedback, and zoom functionality early on, ensuring that users with disabilities were not excluded.
- **Iterative Design and Feedback Loops:** Apple used customer feedback, usage analytics, and market trends to continuously refine the iPhone across generations—adding features like Face ID, improved cameras, and longer battery life.

Design Impact:

Apple's approach demonstrates how user-centred product design can shape consumer expectations and drive brand loyalty. The iPhone became a lifestyle product rather than just a communication tool, which contributed significantly to Apple's long-term business success.

1.4.2 Service Design Case: Swiggy (Platform Design and Customer Experience)

Swiggy is one of India's leading food delivery platforms, and its success is largely driven by a strong **service design strategy** focused on **customer experience, operational efficiency, and digital interaction**.

Key Service Design Features:

- **End-to-End Journey Mapping:** Swiggy mapped the entire user experience—from searching for restaurants, placing an order, tracking delivery, to providing feedback. This allowed the team to identify and improve every customer touchpoint.
- **Real-Time Order Tracking:** The app introduced GPS-enabled tracking, allowing users to monitor their order in real time. This feature increased trust and reduced anxiety around delivery timelines.
- **Integrated Support Systems:** In-app help centres and chat support were designed to quickly resolve complaints, making service recovery fast and efficient.
- **Delivery Partner Experience:** Service design extended beyond customers to include delivery personnel. Swiggy developed features for navigation, earnings tracking, and safety alerts—improving service quality and workforce satisfaction.

- **Personalisation and Recommendations:** The platform used behavioural data to personalise restaurant suggestions, offers, and reorder options, thereby increasing engagement and repeat usage.

Design Impact:

Swiggy's service design demonstrates how technology, logistics, and human interaction can be orchestrated into a seamless experience. By treating both customers and delivery agents as users, the company created a scalable service that maintains consistency across cities and use cases.

1.5 Design Thinking

Design Thinking is a user-focused, problem-solving methodology that integrates creativity, empathy, and analytical thinking. It is widely used in both product and service innovation to generate practical, effective, and human-centred solutions. Unlike traditional linear problem-solving methods, design thinking is iterative and collaborative, encouraging experimentation and user feedback.

1.5.1 Origins and Philosophy of Design Thinking

Design thinking originated from the practices of industrial and product designers in the mid-to-late 20th century. Over time, it was formalised as a repeatable process for innovation and problem-solving beyond design disciplines.

Institutions such as Stanford University's **d.school** and design firms like **IDEO** played a critical role in shaping and popularising the approach.

The philosophy of design thinking rests on several core beliefs:

- **Human-Centredness**: Solutions must be grounded in a deep understanding of people's needs and experiences.
- **Collaboration**: Diverse, cross-functional teams bring richer perspectives to problem-solving.
- **Experimentation**: Early testing and iteration lead to better results than relying solely on planning or intuition.
- **Creativity**: Innovation is not reserved for designers; it can be taught and applied by anyone.
- **Bias Toward Action**: Making and testing prototypes is more effective than endless theorising.

1.5.2 Stages: Empathize, Define, Ideate, Prototype, Test

Design thinking is typically structured into five non-linear stages. These stages are often revisited as teams learn more about the problem and users.

1. **Empathize**

   This stage involves understanding the users' needs, behaviours, and motivations through direct engagement such as interviews, observations, and immersion. The goal is to gain deep insight into the user's world.
2. **Define**

   Insights from the empathy phase are synthesised into a clear and concise **problem statement** or **point of view**. This helps focus the design challenge on what truly matters to users.
3. **Ideate**

   In this stage, teams brainstorm a wide range of creative solutions, encouraging quantity over quality initially. Techniques such as mind mapping, “How Might We” questions, and role-playing are often used.
4. **Prototype**

   Designers create simple, inexpensive versions of ideas that can be tested quickly. Prototypes can be physical models, sketches, role plays, digital wireframes, or mock service flows.
5. **Test**

   Prototypes are tested with real users to gather feedback, identify flaws, and discover new insights. Testing is not the end; it often leads back to redefining the problem or creating improved ideas.

This process is iterative rather than linear. Teams may return to earlier stages multiple times as their understanding evolves.

1.5.3 Applications in Product and Service Innovation

Design thinking is applied across industries and sectors to solve complex problems and drive innovation. Its flexibility makes it suitable for both tangible product development and intangible service improvements.

Applications in Product Innovation:

- Designing user-friendly consumer electronics
- Creating intuitive mobile and web applications
- Developing medical devices that meet patient and practitioner needs

Applications in Service Innovation:

- Redesigning patient experiences in hospitals

- Improving customer support processes in telecom services
- Enhancing the onboarding process in digital banking platforms

Organizations also use design thinking for internal challenges such as improving employee engagement, streamlining operations, or redesigning training programs.

The core advantage is that solutions are grounded in real-world user insights, which increases the likelihood of adoption and long-term success.

1.5.4 Limitations and Critiques of Design Thinking

While design thinking has gained widespread popularity, it also faces several critiques and limitations:

1. **Superficial Adoption**
   In many organisations, design thinking is reduced to a workshop or checklist, without deeper cultural or strategic integration.
2. **Lack of Rigour**
   Critics argue that the process can lack analytical depth or evidence-based methods, especially when used in isolation from other tools.
3. **Not Always Scalable**
   What works in a small design sprint may not scale easily across complex systems or large organisations.
4. **Time and Resource Intensive**
   True user research and iterative prototyping require time, resources, and access to users—which may not be feasible in all settings.
5. **Misalignment with Business Goals**
   Overemphasis on user needs may sometimes conflict with business constraints such as cost, regulations, or strategic priorities.

Despite these critiques, design thinking remains a valuable tool when applied thoughtfully and in combination with other business, technical, or research methodologies.

Did You Know?

"Design Thinking has been criticised for being "colonial" in some contexts. Critics argue that applying Western-centric design methodologies in non-Western or indigenous cultures—without

considering local ways of knowing and doing—can result in superficial or even harmful solutions." As a result, many scholars now advocate for **decolonising design thinking** by integrating local voices and participatory methods in culturally sensitive ways."

1.6 Double Diamond Framework

The **Double Diamond Framework** is a visual model developed by the **UK Design Council** to represent the key stages of the design process. It emphasises two critical thinking modes: **divergent** (exploring broadly) and **convergent** (focusing narrowly), applied twice—first to define the problem, and second to develop the solution.

The framework is widely used in product and service design, especially in human-centred and design thinking methodologies, due to its clarity and emphasis on iterative exploration.

1.6.1 Double Diamond: Convergent vs Divergent Thinking

The Double Diamond illustrates two consecutive phases of **divergence** and **convergence**.

- **Divergent thinking** is about **expanding** possibilities. It involves gathering insights, generating ideas, and exploring multiple perspectives.
- **Convergent thinking** is about **narrowing down** choices. It includes evaluating, filtering, and selecting the most promising ideas or problems to pursue.

These two thinking modes are alternated:

- First diamond: Diverge (discover user needs) → Converge (define the problem)
- Second diamond: Diverge (generate ideas) → Converge (deliver a solution)

This structured alternation ensures that design teams do not jump to solutions too early and that they explore a wide enough range of options before making decisions.

1.6.2 Discover vs Define Phases

The first half of the Double Diamond focuses on **understanding the problem**:

1. **Discover (Diverge)**
   This phase involves gathering information about the user, the context, and the broader

environment. Methods such as interviews, ethnographic research, surveys, and observations are used to explore user behaviours and uncover unmet needs.

Goals of this phase include:

- Gaining empathy for users
- Identifying hidden patterns or challenges
- Avoiding assumptions

2. **Define (Converge)**

   After collecting insights, the team works to synthesise the data into a clear and focused **problem statement**. This phase narrows down the scope by identifying the key issue worth solving.

Tools used may include:

- Affinity mapping
- Insight synthesis
- Point-of-view (POV) statements
- Problem framing techniques

The output of this stage is a well-defined challenge that reflects real user needs and aligns with business goals.

"Activity: Conduct a Mini Double Diamond Exercise"

Choose a problem in your college or local community (e.g., long queues at the canteen, lack of access to mental health resources).

1. **Discover**: Interview or observe at least three people affected by the issue. Note their experiences and challenges.
2. **Define**: Synthesize the insights into a **single clear problem statement** (not more than 2 lines).
3. Submit a visual representation of your Discover-Define process (bullet points, mind map, or a simple sketch) along with your problem statement.

Optional: Present your problem statement in class and get feedback from peers on whether it accurately reflects user needs.

1.6.3 Develop vs Deliver Phases

The second half of the Double Diamond focuses on **solving the problem**:

3. **Develop (Diverge)**

   In this phase, the team generates a wide range of possible solutions. Brainstorming, sketching, rapid prototyping, and ideation workshops are commonly used. Collaboration and creativity are essential to ensure diverse perspectives are considered.

Characteristics of this phase:

- Testing multiple ideas
- Embracing experimentation
- Encouraging innovation without immediate judgment

4. **Deliver (Converge)**

   This is the phase where selected ideas are tested, refined, and finalised. Prototypes are validated with users, and feedback is used to make improvements. Once validated, the solution is implemented or launched.

Activities include:

- User testing
- Iterative refinement
- Finalising specifications
- Deployment and scaling

This phase ensures the chosen solution is practical, desirable, and feasible.

1.6.4 Managing Divergence and Convergence

Balancing divergence and convergence is a key skill in design management. Too much divergence can lead to confusion and indecision, while premature convergence can result in missed opportunities or user misalignment.

Effective management involves:

- Setting clear timeframes for exploration and decision-making
- Encouraging open-minded thinking during divergence
- Using evidence and criteria to guide convergence
- Facilitating team discussions to align on insights and priorities

Design leaders often act as facilitators, helping teams navigate transitions between expansive and focused modes of thinking.

1.6.5 Using Double Diamond in Iterative Design

The Double Diamond is not a one-time, linear process. It is often used in **iterations**, especially in agile or lean design environments. After testing a solution in the Deliver phase, new user feedback may trigger another discovery process, starting the cycle again.

Key practices in iterative use include:

- Revisiting earlier phases when new information emerges
- Using feedback loops to refine both problem definitions and solutions
- Running multiple design sprints, each following a Double Diamond pattern

In iterative projects, teams may even run **mini double diamonds** within a larger cycle to focus on specific sub-problems or features.

This iterative nature ensures continuous improvement and better alignment with user needs and business objectives over time.

1.7 Value Proposition Canvas (VPC)

The **Value Proposition Canvas (VPC)** is a strategic design tool developed by Alexander Osterwalder. It is used to ensure that a product or service is positioned around what the customer values and needs. The VPC breaks down the relationship between the **value proposition** of a business and its **target customer segments**.

The canvas is divided into two main components:

1. **Customer Profile** – captures the understanding of the customer
2. **Value Map** – outlines how the business creates value

The ultimate goal of using the VPC is to achieve a **fit** between what the business offers and what the customer actually wants.

1.7.1 Customer Profile: Jobs, Pains, Gains

The **Customer Profile** describes the characteristics and expectations of a specific customer segment. It includes three key elements:

1. **Customer Jobs**

   These are the tasks, problems, or needs the customer is trying to address. Jobs can be:

   - **Functional** (e.g., commuting to work)
   - **Social** (e.g., appearing competent in a professional setting)
   - **Emotional** (e.g., feeling secure, avoiding stress)

2. **Customer Pains**

   These are negative experiences or obstacles the customer faces while trying to complete a job. They can include:

   - Undesired costs (e.g., too expensive)
   - Negative emotions (e.g., frustration)
   - Risks or uncertainties (e.g., fear of making a wrong decision)

3. **Customer Gains**

   These are the benefits or positive outcomes the customer expects or desires. Gains can be:

   - Required (e.g., minimum expectations)
   - Expected (e.g., features customers would appreciate)
   - Unexpected (e.g., delightful surprises or innovations)

Understanding the customer profile allows businesses to focus on real-world needs and to design more relevant value propositions.

"Activity: Create a Customer Profile Canvas"

Select a service you frequently use (e.g., food delivery, online learning, banking). Interview at least one user of this service and identify:

- **Three functional jobs** they are trying to complete using the service
- **Two emotional or social jobs** that affect their decisions
- **Three major pains** they experience with the current service
- **Three gains** they value or desire

Use these findings to draw a **Customer Profile Canvas**, clearly labelling jobs, pains, and gains. Include a short (150–200 word) reflection on how this exercise changed your view of user needs and expectations.

1.7.2 Value Map: Products, Pain Relievers, Gain Creators

The **Value Map** describes how a product or service creates value in relation to the customer profile. It includes three elements:

1. **Products and Services**
   The specific offerings a company provides that help customers perform their jobs. These may be:
   - Physical products
   - Digital products
   - Services or experiences
2. **Pain Relievers**
   These explain how the product or service addresses specific customer pains. Examples include:
   - Reducing cost or effort
   - Eliminating risks or frustrations
   - Simplifying a complex process
3. **Gain Creators**
   These describe how the product or service creates customer gains. Examples include:
   - Improving results
   - Adding convenience
   - Enabling new possibilities

The value map helps teams think critically about how their offerings directly support or improve the customer experience.

1.7.3 Achieving Fit Between Customer Needs and Value Proposition

A strong value proposition exists when there is a **clear match** or **fit** between the **Customer Profile** and the **Value Map**. This is known as **problem-solution fit** or **product-market fit**, depending on the stage of development.

Types of fit include:

- **Problem-Solution Fit** (early stage):
  The business has evidence that its product or service addresses real customer jobs, pains, and gains.
- **Product-Market Fit** (growth stage):
  Customers are actively using and valuing the product, demonstrating sustained demand and satisfaction.

Achieving fit requires:

- Conducting real user research to validate assumptions
- Iteratively testing and refining the value proposition
- Adjusting offerings based on market feedback

Without a fit, even well-designed products may fail because they do not address meaningful customer problems.

1.7.4 Case Applications of VPC

Case 1: Uber – Urban Mobility

- **Customer Jobs:** Get from one place to another quickly and affordably.
- **Pains:** Difficulty hailing taxis, unpredictable pricing, lack of safety.
- **Gains:** Convenience, predictable arrival times, cashless payment.
- **Value Map:**
    - **Product:** On-demand ride-sharing app.
    - **Pain Reliever:** Real-time tracking, price estimates, driver ratings.
    - **Gain Creator:** One-tap booking, discounts, 24/7 availability.

Case 2: Airbnb – Travel Accommodation

- **Customer Jobs:** Find affordable, comfortable places to stay while travelling.
- **Pains:** Expensive hotels, lack of personal experience, limited local connection.
- **Gains:** Unique homes, local immersion, variety of price points.
- **Value Map:**
    - **Product:** Online marketplace for short-term lodging.
    - **Pain Reliever:** Lower costs, better amenities, direct communication with hosts.
    - **Gain Creator:** Cultural immersion, personalised experiences, flexible stays.

These cases illustrate how aligning the value proposition with specific customer segments leads to scalable business models and customer loyalty.

1.8 Service Blueprinting Basics

Service blueprinting is a structured visual tool used to analyse, design, and improve service experiences. It helps organisations understand how services are delivered by mapping interactions between customers, employees, and systems across different stages of a service journey.

Originally introduced by Lynn Shostack in 1984, service blueprints are widely used in service design, customer experience management, and operations strategy. They support clarity, coordination, and improvement of service processes—especially those that are complex or involve multiple stakeholders.

1.8.1 Purpose and Components of Service Blueprints

Service blueprints are detailed visual tools used to map out the structure and delivery of a service. Their primary purpose is to represent both the customer-facing and behind-the-scenes components of a service experience. By outlining each step involved in service delivery, service blueprints support organizations in designing, analyzing, and improving their operations. They are especially valuable in identifying gaps, inefficiencies, and potential points of failure within a service system. Additionally, they help align various functional teams—such as marketing, customer support, IT, and operations—around a unified understanding of how the service should work. Ultimately, service blueprints are instrumental in enhancing the customer experience by ensuring that all interactions and supporting processes are well-coordinated and effectively managed.

The core structure of a service blueprint consists of several key components. First are the **customer actions**, which refer to the steps taken by the customer throughout their interaction with the service. These actions are the starting point for designing the service and represent the user's perspective. Next are the **frontstage (visible contact) actions**, which include all interactions between the customer and the service provider that are visible to the customer, such as speaking to a staff member, receiving a confirmation email, or navigating a website interface. These interactions shape the customer's direct experience and perception of the service.

Behind the scenes, the **backstage (invisible contact) actions** involve employees or systems performing tasks that are not visible to the customer but are essential for the service to function. These could include an agent checking internal records, scheduling appointments, or updating databases. Further supporting these backstage actions are the **support processes**, which involve internal departments or external partners whose work enables the overall service delivery. Examples include IT system maintenance, inventory management, or supplier coordination. Another crucial component is **physical evidence**, which refers to the tangible items or materials that the customer encounters during the service, such as receipts, signage,

packaging, or emails. These items serve as proof of interaction and help communicate the brand or quality of the service.

To organize these elements effectively, service blueprints use three dividing lines. The **line of interaction** separates the customer's actions from the visible interactions with the service provider. The **line of visibility** distinguishes what is visible to the customer (frontstage) from what is not (backstage). Finally, the **line of internal interaction** separates backstage actions from deeper support processes. These dividing lines help clarify roles, responsibilities, and boundaries across different layers of the service ecosystem.

Service blueprints are used across various sectors, including healthcare, retail, education, finance, hospitality, and public services. For example, in healthcare, a service blueprint might map the patient's experience from booking an appointment to receiving treatment and follow-up. In e-commerce, it could illustrate the process from online shopping to order fulfillment, delivery, and return. In each context, the blueprint helps stakeholders understand how each part of the system contributes to the customer experience, allowing them to identify inefficiencies, streamline operations, and design services that are more user-centered and effective.

In conclusion, service blueprints are powerful tools that bring visibility and clarity to complex service systems. By capturing the full spectrum of customer interactions and internal operations, they enable more strategic service design, reduce breakdowns, and promote collaboration across departments. Their structured yet flexible format makes them indispensable for organizations aiming to deliver seamless and high-quality service experiences.

1.8.2 Frontstage vs Backstage Processes

Frontstage Processes:

These are the parts of the service that are **visible** to the customer. They include:

- Direct communication (e.g., a waiter taking an order)
- Interface interactions (e.g., booking through a mobile app)
- Physical spaces (e.g., store layout or reception desk)

These elements shape the customer's **perception** of the service and are directly linked to **satisfaction and trust**.

Backstage Processes:

These are the **invisible** operations that support the service but occur behind the scenes. Examples include:

- Order preparation in a kitchen

- Automated data processing
- Inventory management
- Staff coordination or internal communication

Efficient backstage processes are critical for ensuring consistency and quality in the visible parts of the service.

Did You Know?

"In service design, some industries now employ **"service camouflage"**, where the backstage is intentionally made to feel like part of the frontstage. For example, open kitchens in restaurants or visible order preparation counters in coffee chains create transparency and trust—while still managing efficiency. This blending of frontstage and backstage is a strategic choice to enhance customer perception."

1.8.3 Mapping Touchpoints and Customer Journey

Service blueprinting involves mapping key **touchpoints** along the **customer journey**. A touchpoint is any interaction between the customer and the organisation, whether human, digital, or physical.

Steps in mapping touchpoints:

1. **Identify the user journey** – Define the start and end points of the service experience (e.g., booking a ride to completing payment).
2. **List all customer actions** – Break down the service into individual user steps.
3. **Link frontstage and backstage activities** – For each customer action, determine the associated staff tasks or system processes.
4. **Map physical evidence** – Note what the customer sees or interacts with at each touchpoint.
5. **Highlight pain points** – Identify steps where errors, delays, or confusion occur.

This mapping reveals opportunities for improvement, automation, or redesign.

1.8.4 Improving Service Delivery through Blueprinting

Service blueprints are used not just for documentation but also for **service innovation and improvement**. By visualising the entire system, teams can identify:

- **Redundancies** in processes or staff actions
- **Bottlenecks** in service flow (e.g., long queues, delayed responses)
- **Breakdowns** in communication or technology
- **Mismatch** between customer expectations and service delivery

Improvements may involve:

- Reassigning tasks between frontstage and backstage
- Redesigning user interfaces
- Automating repetitive processes
- Adding or removing touchpoints for better flow

Blueprints also promote **cross-functional collaboration** by creating a shared understanding of how the service works across departments.

Example:
In a healthcare clinic, a blueprint might reveal that long wait times are caused by inefficient coordination between reception and lab technicians. Redesigning appointment scheduling and internal alerts can significantly improve the patient experience.

1.9 Business Model Canvas (BMC)

The **Business Model Canvas (BMC)** is a strategic management tool that provides a **visual framework** for developing, analysing, and innovating business models. Developed by **Alexander Osterwalder**, the BMC simplifies complex business planning by focusing on **nine interconnected building blocks** that describe how an organisation creates, delivers, and captures value.

It is widely used by startups, corporates, and entrepreneurs to map out business ideas, test assumptions, and align stakeholders around a common vision.

1.9.1 Nine Building Blocks of BMC

The Business Model Canvas consists of **nine key elements**, which are usually arranged visually in a single-page canvas. These blocks are:

1. **Customer Segments** – The different groups of people or organisations the business serves.

2. **Value Proposition** – The unique mix of products, services, and benefits offered to solve customer problems or fulfill needs.
3. **Channels** – The means through which the value proposition is delivered to customers.
4. **Customer Relationships** – The types of relationships a business establishes and maintains with its customer segments.
5. **Revenue Streams** – The ways in which the business earns income from its customer segments.
6. **Key Resources** – The most important assets required to deliver the value proposition.
7. **Key Activities** – The essential tasks the business must perform to operate successfully.
8. **Key Partnerships** – The external entities that help the business deliver its value (e.g., suppliers, distributors, alliances).
9. **Cost Structure** – All the costs involved in operating the business model.

These elements are connected and should be considered as part of a whole system rather than in isolation.

1.9.2 Customer Segments, Value Proposition, and Channels

Customer Segments:

This block identifies the distinct groups the business targets. Segments can be based on demographic, geographic, behavioural, or psychographic criteria. Types of customer segments include:

- Mass market (e.g., consumer electronics)
- Niche market (e.g., luxury goods)
- Segmented (e.g., different banking services for students and professionals)
- Diversified (e.g., Amazon serves both consumers and third-party sellers)
- Multi-sided platforms (e.g., Airbnb serves both hosts and guests)

Value Proposition:

This refers to the combination of products, services, and experiences that deliver value to each segment. A strong value proposition addresses:

- Functional value (e.g., performance, cost-saving)
- Emotional value (e.g., brand image, status)
- Social value (e.g., peer influence, connection)

Channels:

Channels are how the business communicates with and delivers value to customers. This includes:

- Communication (e.g., advertising, email)

- Distribution (e.g., physical stores, online platforms)
- Service delivery (e.g., apps, call centres)

Effective channel design ensures a smooth customer journey and consistent brand experience.

1.9.3 Revenue Streams and Cost Structures

Revenue Streams:

This block outlines how the company generates income. Revenue can come from:

- Product sales
- Subscription fees
- Usage fees
- Licensing
- Advertising
- Brokerage or commission fees

Each stream should be linked to a specific customer segment and value proposition.

Cost Structure:

This refers to all expenses related to operating the business. Costs may be:

- **Fixed** (e.g., salaries, rent)
- **Variable** (e.g., shipping, production)
- **Economies of scale** (cost per unit decreases as output increases)
- **Economies of scope** (cost advantages through variety)

Understanding cost structure helps businesses identify key cost drivers and optimise for efficiency.

1.9.4 Applications in Startups and Corporates

In Startups:

The BMC is widely used by startups as a **lean tool** to test and iterate business ideas quickly. Rather than writing lengthy business plans, startups use the canvas to:

- Visualise hypotheses about the business model
- Identify risks and assumptions
- Conduct customer discovery and validation
- Pivot or adjust based on market feedback

This approach is often aligned with **Lean Startup methodology**, where fast learning and adaptation are crucial.

In Corporates:

Large organisations use the BMC for:

- Designing new business lines or services
- Exploring digital transformation strategies
- Aligning cross-functional teams on shared objectives
- Identifying gaps or inefficiencies in existing models

Corporates may also use the BMC to visualise and assess competitor business models or simulate responses to market disruptions.

By facilitating a **common language for strategy and innovation**, the BMC supports decision-making and business agility across industries.

Knowledge Check 1

Choose the correct option:

1. **Which of the following best distinguishes product design from service design?**
   A. Product design focuses on the customer journey; service design does not
   B. Service design always results in a physical product
   C. Product design delivers tangible items; service design delivers intangible experiences
   D. Service design is only used in hospitality and healthcare industries
2. **In the Double Diamond Framework, which of the following correctly represents the first phase?**
   A. Define
   B. Develop
   C. Discover
   D. Deliver
3. **In the Value Proposition Canvas, "pains" refer to:**
   A. Tasks that customers enjoy doing
   B. Negative outcomes or obstacles customers experience
   C. Features of the product that create delight
   D. Cost structure issues for the company

4. **Which building block in the Business Model Canvas describes how a company communicates with and reaches its customers?**
   A. Key Resources
   B. Channels
   C. Revenue Streams
   D. Customer Relationships
5. **Which of the following is an example of a frontstage activity in a service blueprint?**
   A. Back-end inventory management
   B. A delivery person handing over a package
   C. Payment gateway encryption
   D. Internal employee chat system

1.10 Summary

- This module introduced key frameworks and concepts in modern design practice, especially in the context of product and service innovation. It explored the distinctions and overlaps between **product and service design**, the value of **lifecycle thinking**, and the principles behind **human-centred design**. Practical methodologies such as **design thinking**, the **Double Diamond Framework**, the **Value Proposition Canvas (VPC)**, **Service Blueprinting**, and the **Business Model Canvas (BMC)** were presented as tools to align user needs with business goals.
- Through case-based discussions, such as those involving **Apple's iPhone**, **Swiggy**, and **Airbnb**, the application of these concepts in real-world contexts was illustrated. These tools and mindsets are essential for organisations looking to innovate responsibly and sustainably in highly competitive markets.

1.11 Key Terms

1. **Product Design** - The process of creating tangible or digital products to meet user needs.
2. **Service Design** - The planning and organising of people, infrastructure, and processes to improve service experiences.
3. **Lifecycle Thinking** - A design approach that considers the entire lifespan of a product or service.
4. **Human-Centred Design (HCD)** - An approach that places the user at the core of the design process.
5. **Design Thinking -** A five-stage, iterative method of creative problem-solving based on user needs.

6. **Double Diamond** - A model illustrating divergent and convergent phases in problem and solution development.
7. **Value Proposition Canvas** - A tool to match a product/service's offerings with customer jobs, pains, and gains.
8. **Service Blueprint** - A visual representation of service delivery processes and customer interactions.
9. **Business Model Canvas** - A strategic framework for describing, analysing, and designing business models.

1.12 Descriptive Questions

1. Explain the key differences between product design and service design. Provide real-world examples.
2. What is lifecycle thinking, and how does it influence design and business decisions?
3. How does empathy contribute to the success of human-centred design processes?
4. Discuss the importance of prototyping and feedback in the design thinking process.
5. Describe each phase of the Double Diamond Framework and explain how it promotes iterative design.
6. Outline the components of the Value Proposition Canvas and explain their interconnections.
7. How can service blueprinting improve customer experience and operational efficiency?
8. In what ways can startups and corporates benefit from using the Business Model Canvas?
9. Compare and contrast usability, accessibility, and inclusivity in design contexts.
10. How do customer segments, revenue streams, and cost structures influence a business model?

1.13 References

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Answers to Knowledge Check

Knowledge Check 1

1. C Product design delivers tangible items; service design delivers intangible experiences
2. C Discover
3. B Negative outcomes or obstacles customers experience
4. B Channels
5. B A delivery person handing over a package

1.14 Case Study

Airbnb – Applying Design Thinking, VPC, and BMC for Disruptive Service Innovation

Background:

Founded in 2008, Airbnb disrupted the hospitality industry by offering a platform where individuals could rent out spare rooms or entire homes. What began as a solution to high hotel prices during a design conference in San Francisco has grown into a global business serving millions of users in over 190 countries.

Application of Design Thinking:

Airbnb's founders initially used **design thinking** to understand why early users were not booking accommodations. By visiting hosts and observing user behaviour, they realised that poor-quality photos were a key deterrent. In response, they offered professional photography services—an insight directly derived from **empathising** with users and prototyping new solutions. This iterative and user-driven approach shaped many subsequent platform features.

Use of Value Proposition Canvas (VPC):

- **Customer Jobs:** Find unique, affordable, and trustworthy lodging.
- **Pains:** Expensive hotels, lack of personal touch, uncertainty in booking.
- **Gains:** Local experiences, affordability, flexibility, community trust.
- **Pain Relievers:** Secure payments, verified profiles, reviews, 24/7 support.
- **Gain Creators:** Personalised listings, variety of choices, local recommendations.

By clearly mapping customer needs and aligning services with them, Airbnb continuously refined its offerings.

Business Model Canvas (BMC) Overview:

Component	Description
Customer Segments	Travellers, business users, property owners
Value Proposition	Affordable, local, unique travel accommodations

Channels	Website, mobile app, email notifications
Customer Relationships	Self-service with community interaction and support
Revenue Streams	Commission from bookings
Key Resources	Platform, technology, brand, community trust
Key Activities	Platform development, user acquisition, trust & safety enforcement
Key Partnerships	Hosts, photographers, local governments
Cost Structure	Technology maintenance, customer service, marketing

Outcome:

Airbnb scaled rapidly by applying **human-centred insights**, aligning its **value proposition** with evolving customer needs, and continuously adapting its **business model**. It remains a prime example of how service innovation, driven by thoughtful design, can disrupt established industries.

Unit 2: Design Research & Problem Theory

Learning Objectives

1. **Explain** how to define and prioritise real-world problems that are worth solving using user-centred methods.
2. **Describe** the role of **Problem Theory** and the **Theory of Change (ToC)** in shaping socially impactful design solutions.
3. **Apply** contextual inquiry and ethnographic research techniques to gather deep insights from user environments.
4. **Differentiate** between user acquisition and retention strategies in the context of design and innovation.
5. **Plan and conduct** field research ethically and effectively to validate assumptions and understand user behaviour.
6. **Synthesize** qualitative data into meaningful patterns and user insights that inform design direction.
7. **Evaluate** real-world case studies to identify best practices in problem framing and research-driven innovation.

Content

2.0 Introductory Caselet

Rehan's Ride: A Transportation Dilemma in Rural Maharashtra

Background:

Rehan is a 23-year-old school teacher in a rural village in Maharashtra. Every morning, he travels nearly 12 km to the government school where he teaches. There is no direct bus route, and public transport is irregular. He currently shares a ride with a local farmer on a motorcycle, but this is unreliable—especially during the monsoon season. Often, he arrives late or has to cancel classes altogether, affecting both student attendance and performance.

Recently, a local NGO approached the community to discuss potential transportation solutions. Several ideas were proposed: providing bicycles to teachers, starting a shared auto-rickshaw service, or lobbying the regional transport authority for a new bus route. However, the NGO team soon realised that they were unclear about **which problem** needed to be solved—was it a transportation issue, a scheduling problem, or something deeper related to infrastructure and policy?

This case highlights the importance of correctly **framing the problem** before jumping to solutions.

Critical Thinking Question:

Before proposing a solution for Rehan's situation, how should the NGO define the core problem? What methods could they use to validate whether it's the right problem to solve?

2.1 Defining Problems Worth Solving

A critical step in the design and innovation process is **defining the right problem**—one that is meaningful, actionable, and grounded in real user needs. Many projects fail not because of poor solutions, but because they are solving the **wrong problem** or an ill-defined one. Therefore, problem framing is a deliberate and structured activity that precedes ideation and solution development.

Importance of Problem Definition

Problem definition helps to:

- Avoid **solution bias**, where teams jump to fixing symptoms rather than causes
- Align stakeholders on what exactly is being addressed
- Focus time and resources on what truly matters to users
- Uncover **root causes** rather than treating surface-level issues

Characteristics of Problems Worth Solving

Not every problem is worth solving within a design or business context. A problem is typically considered "worth solving" when it meets the following criteria:

1. **User-Centred:** It affects a real group of users whose needs are unmet or underserved.
2. **High Impact:** Solving it would lead to significant positive change—socially, economically, or experientially.
3. **Feasibility:** The problem can be addressed with available resources, knowledge, and tools.
4. **Strategic Relevance:** It aligns with organisational or societal goals and priorities.
5. **Urgency or Frequency:** It occurs often or causes high levels of dissatisfaction or inefficiency.

Common Pitfalls in Problem Framing

1. **Framing the Problem Too Broadly**
   Example: “Improve education in rural India” is too general and lacks focus.
2. **Framing the Problem Too Narrowly**
   Example: “Provide Rehan with a bicycle” jumps to a specific solution without exploring other causes.

3. **Focusing on Symptoms, Not Root Causes**
   Example: Addressing lateness without investigating transport availability, scheduling, or policy gaps.
4. **Not Involving the User Early Enough**
   Without first-hand user insights, the problem may be based on assumptions rather than real needs.

Tools and Techniques for Defining Problems

- **5 Whys Analysis**: Helps uncover root causes by repeatedly asking "why" behind each symptom.
- **How Might We (HMW) Questions**: Reframes insights into opportunity areas for exploration.
- **Problem Statement Templates**: E.g.,
  "User X needs a way to Y because Z."
- **Stakeholder Mapping**: Identifies who is affected and who influences the problem space.
- **Journey Mapping**: Visualises the user's end-to-end experience to pinpoint pain points.

2.1.1 Identifying Real-World Problems vs. Surface-Level Symptoms

In any design or innovation process, it is essential to **distinguish between a real problem and a symptom**. Many solutions fail because they address visible issues without understanding their underlying causes.

Surface-Level Symptoms

Symptoms are the **observable signs** of a deeper problem. They are often what users complain about or what designers notice first.

Examples:

- Long queues at a hospital
- High dropout rates in an online course
- Low app usage by rural users

These are all real challenges, but they are not necessarily the **root problems**.

Real-World Problems

Real problems are the **underlying causes** that give rise to the symptoms. Identifying them requires investigation, observation, and user research.

Root problem examples:

- Hospital queues caused by poor appointment scheduling systems
- Dropouts due to lack of mobile data access or language barriers
- Low app usage due to unfamiliar UI or poor digital literacy

Key Techniques to Identify Root Problems:

- **5 Whys Method**: Repeatedly asking "why" to drill down to the cause
- **Contextual Inquiry**: Observing users in their natural environment
- **Stakeholder Interviews**: Talking to people across the service or product ecosystem

By solving root problems, designers ensure that their solutions are meaningful and long-lasting.

2.1.2 Frameworks for Problem Definition

Structured frameworks can help teams define problems in a **clear, focused, and actionable** manner. These frameworks guide teams to move from broad ideas to specific design challenges.

Common Frameworks:

1. **Problem Statement Template**
   A clear and concise statement that defines what needs to be solved.
   Format:
   [User/Stakeholder] needs a way to [do something] because [reason].

Example:
Teachers in rural areas need a reliable way to commute because current transport is inconsistent and affects attendance.

2. **Point of View (POV) Statement**
   Used in design thinking to focus the problem around the user's perspective.
   Format:
   [User] needs [need] because [insight].
3. **How Might We (HMW) Questions**
   Open-ended prompts that turn insights into design opportunities.
   Example:
   How might we help rural teachers manage their travel reliably during the monsoon?
4. **Problem Tree Analysis**
   Visual mapping of the **core problem**, its **causes**, and its **effects** to understand the full ecosystem.

5. **Theory of Change (ToC) Lens**

   (Discussed in Section 2.2) Helps define problems in relation to long-term impact goals.

These frameworks help teams avoid vague problem definitions and stay aligned with user needs.

2.1.3 Prioritizing Problems Based on Impact and Feasibility

Not all problems can or should be solved at once. Prioritisation ensures that resources are directed toward issues that will **deliver the most value**.

Key Prioritisation Criteria:

1. **User Impact**
   - Does solving this problem significantly improve user experience or outcomes?
   - How many users are affected?
2. **Business Relevance**
   - Does it align with organisational goals?
   - Will it enhance efficiency, retention, or revenue?
3. **Feasibility**
   - Can the team solve it with available time, resources, and skills?
   - Are there regulatory, technical, or logistical constraints?
4. **Urgency and Frequency**
   - How often does the problem occur?
   - Is it time-sensitive or linked to critical operations?

Tools for Prioritisation:

- **Impact-Feasibility Matrix**

  Plot problems on a 2x2 grid with **Impact** on one axis and **Feasibility** on the other. Focus on high-impact, high-feasibility problems first.
- **MoSCoW Method**

  Categorise problems into:
  - **Must Have**
  - **Should Have**
  - **Could Have**
  - **Won't Have (for now)**

By using such tools, design teams can make informed, strategic choices.

2.1.4 Linking Problems to User and Business Needs

A problem is only worth solving if it is **meaningful to users** and **valuable to the business**. Design that ignores one side of this equation is likely to fail in the real world.

User Needs

These are derived from direct research and observation. Common types of needs include:

- **Functional** (e.g., access to reliable transport)
- **Emotional** (e.g., feeling safe or respected)
- **Social** (e.g., being connected or recognised)

Understanding these needs helps ensure that the problem is **relevant and desirable** to users.

Business Needs

These reflect what an organisation must achieve to succeed:

- Growth and revenue
- Customer acquisition and retention
- Operational efficiency
- Brand reputation

Aligning User and Business Perspectives:

To achieve design success, the identified problem should:

- Solve a **real pain point** for users
- Support a **measurable business outcome**
- Be positioned as a **shared goal** across teams (design, marketing, operations, etc.)

Example:

A ridesharing company may identify poor driver retention as a problem.

- **User need**: Drivers need better support and earnings.
- **Business need**: The company needs to reduce driver turnover.
- **Aligned problem statement**: How might we improve the driver experience to increase retention and reduce operational costs?

2.2 Problem Theory and Theory of Change (ToC)

In design and innovation, particularly in social and public sectors, it is not enough to identify symptoms or superficial issues. Understanding the **theory behind a problem** and planning **how change will occur** is essential for achieving meaningful, long-term outcomes. This section introduces two foundational approaches:

- **Problem Theory** – focuses on understanding the **structure and logic of problems**
- **Theory of Change (ToC)** – outlines how specific **actions will lead to desired outcomes and impact**

Together, they help teams ground their design efforts in deeper analysis and evidence-based thinking.

2.2.1 Introduction to Problem Theory

Problem Theory is a foundational concept in design thinking, systems thinking, and decision-making disciplines. It focuses on understanding how problems are **perceived, framed, structured, and analyzed** before any solutions are proposed or implemented. Rather than rushing toward immediate fixes, problem theory emphasizes the importance of exploring the **nature, context, and complexity** of a problem. This perspective allows for a more strategic and effective approach to innovation and solution development, especially in environments where challenges are ambiguous or multi-dimensional.

A central idea within problem theory is the distinction between **well-defined** and **ill-defined (or wicked)** problems. Well-defined problems are those with clear objectives, measurable criteria, and identifiable solutions. These are often technical in nature and can be addressed using established methods or algorithms. For instance, repairing a broken hyperlink on a website or optimizing a database query are examples of well-defined problems. In contrast, ill-defined or wicked problems are **open-ended, dynamic, and often contested**, with no single "correct" answer. They are characterized by complexity, multiple stakeholders, and shifting goals. Examples include improving urban transportation systems, reducing school dropout rates, or addressing climate change. In such cases, even defining the problem can be a matter of debate.

Another essential concept in problem theory is the idea of the **problem space**, which refers to the broader domain or environment in which a problem exists. This includes not only the technical systems involved, but also the users, stakeholders, organizational constraints, socio-cultural contexts, and external factors that influence or are influenced by the problem. Understanding the problem space is crucial because solutions that overlook contextual factors may lead to unintended consequences or fail to address root causes.

A related distinction is between **problem framing** and **problem solving**. Framing involves identifying and articulating the problem itself—deciding what the problem is, whose problem it is, and how it should be approached. Solving, on the other hand, comes after the problem has been framed and involves generating, testing, and implementing potential solutions. In practice, poor problem framing often results in ineffective solutions, as teams may end up solving the wrong problem altogether. Therefore, a key insight from problem theory is that **time spent on understanding and framing the problem** is just as valuable, if not more so, than time spent on generating solutions.

Importantly, **problem perception is inherently subjective**. Different individuals or groups may interpret the same situation in entirely different ways based on their values, priorities, knowledge, and experiences. For instance, a city's traffic congestion may be seen by commuters as a transportation issue, by urban planners as a zoning issue, and by environmentalists as a sustainability issue. As a result, one of the primary roles of design and innovation teams is to **facilitate dialogue among stakeholders** in order to reconcile these diverse viewpoints and arrive at a shared understanding of the problem. This often involves qualitative research, stakeholder mapping, ethnographic observation, and collaborative workshops.

Problem theory encourages designers and decision-makers to ask critical questions such as: *What kind of problem is this? Who defines it? What systems and contexts does it interact with? What assumptions are being made?* These questions lead to a more reflective, inclusive, and adaptive approach to problem-solving. Rather than treating problems as isolated events to be fixed, problem theory advocates for viewing them as **interconnected systems** that evolve over time and require ongoing learning and adjustment.

In summary, problem theory provides a vital framework for addressing complex challenges in a thoughtful and systemic manner. By focusing on how problems are defined and understood before jumping to solutions, it helps ensure that innovation efforts are both meaningful and effective. This approach is particularly important in today's rapidly changing and interconnected world, where problems are rarely simple and often require **multi-disciplinary, user-centered, and context-aware strategies**.

2.2.2 Mapping Cause-and-Effect Chains

To effectively address complex problems, it's important to understand **how different factors are linked**. Mapping out **cause-and-effect chains** helps trace the origins of an issue and identify where intervention is most effective.

What is a Cause-and-Effect Chain?

A **cause-and-effect chain** is a logical sequence that shows how one issue leads to another, eventually resulting in the observed problem. It is often visualised as a **problem tree** or **logic model**.

Example:

Observed Symptom: Low school attendance in rural areas

Possible Chain:

- Poor roads → Inaccessible transport → Irregular teacher presence → Poor learning environment → Low student motivation → Low attendance

This chain helps identify multiple **intervention points**, such as:

- Transport improvements
- Teacher incentives
- Student engagement programs

Tools for Mapping:

- **Problem Tree Analysis**
  - *Roots* = causes
  - *Trunk* = core problem
  - *Branches* = effects
- **Fishbone Diagrams (Ishikawa)**
  - Categorises causes into domains like people, processes, environment, etc.

Understanding causal relationships avoids "band-aid" solutions and supports sustainable impact.

2.2.3 Theory of Change: Outcomes, Impact, Assumptions

Theory of Change (ToC) is a strategic planning and evaluation method that explains **how and why** a desired change is expected to happen in a particular context. It is widely used in social innovation, policy design, and non-profit work.

Core Elements of ToC:

1. **Inputs** – Resources, people, funding, and tools used to support the project.
2. **Activities** – Specific actions or interventions (e.g., training sessions, workshops, digital platform development).
3. **Outputs** – Immediate results of activities (e.g., number of users trained).
4. **Outcomes** – Short- to medium-term changes in behaviour, skills, or access (e.g., improved job readiness).
5. **Impact** – Long-term systemic change (e.g., reduced youth unemployment).

Importance of Assumptions:

ToC relies on **explicit assumptions** about:

- How people will behave in response to the intervention
- The role of context and external factors
- What must be in place for the change to occur

Documenting these assumptions helps test their validity and adapt strategies when things don't go as planned.

Did You Know?

"The **Theory of Change (ToC)** was originally developed in the 1990s by nonprofits working in international development—not designers. It was created to plan and measure long-term social impact in complex systems like education, health, and poverty reduction. Today, designers and innovators use ToC to structure impact-driven projects—especially when outcomes are not immediately visible."

2.2.4 Application of ToC in Design Projects

Design teams can apply the Theory of Change framework to:

- **Align stakeholders** around a common vision of change
- **Plan interventions** with clear links between actions and results
- **Measure progress** toward outcomes, not just outputs
- **Identify gaps** in logic or unrealistic assumptions before implementation

Steps to Apply ToC in a Design Project:

1. **Define the Impact Goal**
   What long-term change do you want to see?
2. **Work Backwards to Identify Outcomes**
   What changes in behaviour, access, or systems must occur to achieve the impact?
3. **Plan Activities and Outputs**
   What interventions are needed to trigger these outcomes?

4. **Validate Assumptions**

   What needs to be true for the plan to work?

5. **Visualise the ToC**

   Create a diagram showing the logical flow from inputs to impact.

Example – Application in a Digital Education Project:

- **Impact Goal:** Increase digital literacy among rural women
- **Outcomes:**
  - More women using smartphones for information and services
  - Increased confidence in using apps
- **Activities:**
  - Mobile literacy workshops
  - User-friendly app design
- **Assumptions:**
  - Participants have access to phones
  - Cultural norms permit mobile usage
  - Community support is available

Using ToC, the team can build, test, and revise the intervention while staying focused on long-term change.

2.3 Contextual Inquiry & Ethnographic Research

Designing human-centred solutions requires a **deep understanding of people in their natural environments**. While traditional interviews and desk research provide useful information, they often fail to capture **contextual behaviours, unspoken needs, and real-world constraints**.

This is where **contextual inquiry** and **ethnographic research** play a vital role. These methods help designers observe and understand users as they interact with systems, tools, and services in their everyday lives.

2.3.1 Principles of Contextual Inquiry

Contextual Inquiry is a user research method where the researcher observes and interviews a user in their actual environment—while the user performs real tasks. It combines observation with semi-structured dialogue, helping researchers capture **workflow, behaviour, and intent** as they occur.

Key Principles:

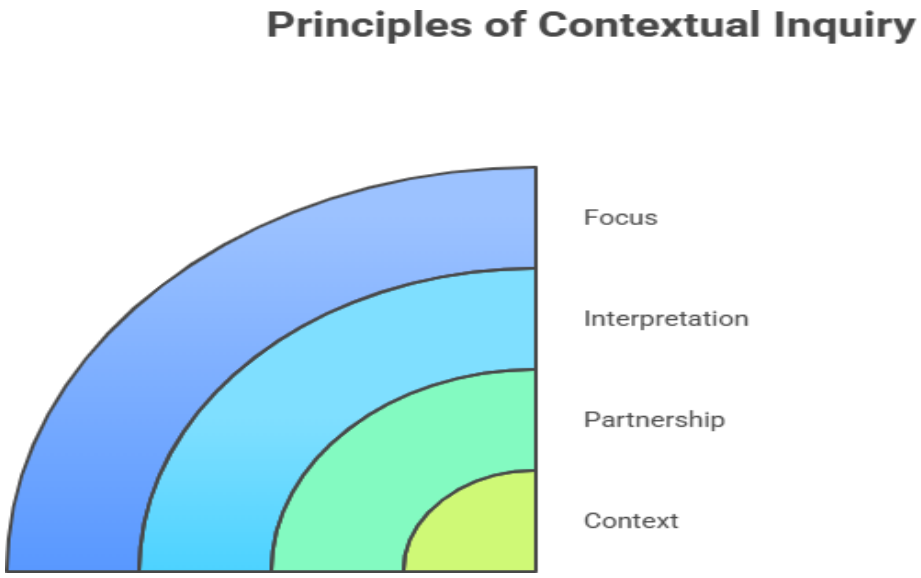

Figure 2.1

1. **Context**

   Study users in the actual setting where the work or activity happens (e.g., office, kitchen, field). This ensures that environmental factors are not overlooked.

2. **Partnership**

   The user is seen as a collaborator or expert in their own work. The researcher engages in conversation rather than just passive observation.

3. **Interpretation**

   Insights are drawn not just from what users say, but how they act. Researchers interpret behaviours in context and validate their interpretations with users when possible.

4. **Focus**

   The inquiry is guided by a clear design or research focus (e.g., how people manage household finances), though it remains open to unexpected findings.

Application Example:

Studying how healthcare workers manage patient data in a rural clinic by observing their routines, tools, and challenges during working hours.

2.3.2 Ethnographic Research in Design

Ethnography is a qualitative research method borrowed from anthropology, focusing on long-term, immersive study of people's behaviours, cultures, and environments. In design, ethnographic research is adapted to gain **rich, human insights** into user needs and systemic challenges.

Characteristics of Design Ethnography:

- Involves **immersion** in the user's environment (sometimes for days or weeks)
- Prioritises **understanding meaning**, motivation, and cultural context
- Focuses on **non-verbal behaviours**, tools, routines, and social interactions
- Often uses **field notes, photography, and video** to record data

Benefits:

- Reveals tacit knowledge users may not be able to articulate
- Exposes real constraints (e.g., physical space, social norms, digital access)
- Helps avoid assumption-driven design by grounding ideas in lived experiences

Example:

Understanding why some rural households avoid government health schemes by spending time in the community, attending local gatherings, and observing informal healthcare practices.

Did You Know?

"Ethnographic research is so powerful that it led to the **invention of the Swiffer mop**. Procter & Gamble researchers observed that people were not satisfied after mopping—they would still wipe the floor with paper towels. This behaviour wasn't mentioned in interviews but was **discovered through observation**. That led to designing Swiffer as a quick, disposable solution that replaced the need to mop and wipe separately."

2.3.3 Observational Methods: Shadowing Users

Shadowing is a focused observational method where the researcher follows (or "shadows") a user during a typical day or workflow to understand what they do, how they do it, and what challenges they face.

How It Works:

- The researcher takes a **non-intrusive role**, observing the user in real time
- Can involve silent observation or occasional clarifying questions
- Ideal for capturing **workflow, interruptions, workarounds**, and tool usage

When to Use:

- When detailed step-by-step understanding is needed
- When users can't clearly explain their process or challenges in interviews
- When behavioural gaps between what users *say* and *do* are expected

Example:

Shadowing a delivery driver across a full route to understand timing, navigation challenges, phone usage, customer interactions, and fatigue patterns.

Tips:

- Obtain **informed consent** from users beforehand
- Keep **detailed notes** and time-stamped observations
- Respect privacy and stop observation in sensitive situations

2.3.4 Surveys and Quantitative Data Collection

While qualitative methods like contextual inquiry and ethnography provide depth, **quantitative methods** like surveys allow researchers to collect **breadth**—i.e., data from larger sample sizes to identify patterns, measure attitudes, or validate insights.

Key Characteristics of Surveys:

- Structured and standardised questions
- Delivered via online forms, paper, mobile apps, or interviews
- Results are **statistically analysable** (e.g., percentages, averages, correlations)

Designing Effective Surveys:

1. **Define Objectives** – What are you trying to measure?
2. **Write Clear Questions** – Avoid bias, jargon, or leading language

3. **Choose the Right Format** – Use scales (e.g., Likert), multiple choice, ranking, etc.
4. **Test the Survey** – Pilot with a small group to identify confusing items
5. **Ensure Ethical Data Collection** – Maintain anonymity and get informed consent

Example Use Cases:

- Measuring user satisfaction after using a digital product
- Collecting demographic data for user segmentation
- Validating insights gathered from field observations

Limitations:

- Limited ability to uncover *why* users behave a certain way
- May miss nuance if poorly designed or interpreted in isolation

In practice, surveys are most effective when used in **triangulation**—in combination with qualitative research methods—to ensure both depth and generalisability.

2.4 Differentiation & Retention Models

For any product or service to succeed in a competitive market, it must be both **distinctive** and **sustainable**. This means it must offer something that clearly sets it apart (differentiation) while also retaining users over time (retention). Understanding the relationship between **user needs, business goals, and value delivery** is essential to designing solutions that last.

2.4.1 Differentiating Between User Problems and Business Problems

While user problems and business problems often overlap, they are not the same. Understanding the distinction between the two is critical for designing solutions that are both desirable and viable.

User Problems:

These are **needs, frustrations, or barriers** experienced by end users or customers.

Examples:

- Difficulty navigating an app interface
- Long wait times for service
- Lack of trust in a payment system

Business Problems:

These refer to **challenges faced by the organisation** in achieving goals such as revenue, market growth, or operational efficiency.

Examples:

- Low customer retention rates
- High support costs
- Low conversion from trial to paid users

Why the Distinction Matters:

Designing only for business problems may ignore the user experience. Designing only for user problems may not support sustainable operations. Successful solutions often **bridge the two**, identifying where user needs align with business outcomes.

Example:
If users abandon a subscription app after the first week (user problem: lack of clarity or value; business problem: churn), a redesign of onboarding flows can address both.

2.4.2 Models for Customer Retention and Engagement

Customer **retention** is the ability to keep users over time, while **engagement** refers to how actively and meaningfully users interact with a product or service. High retention typically follows strong engagement.

Key Retention Models:

1. **AARRR Framework (Pirate Metrics)**
    - **Acquisition**: How users find the product
    - **Activation**: First positive experience
    - **Retention**: Returning to use the product
    - **Referral**: Recommending to others
    - **Revenue**: Generating business value

This model helps teams track and optimise the full user lifecycle.

2. **Hook Model (Nir Eyal)**

    Focuses on habit formation through four phases:
    - **Trigger** (internal or external)
    - **Action** (user behavior)
    - **Variable Reward** (inconsistent satisfaction)

- **Investment** (user puts in effort, making future use more likely)

3. **RFM Model (Recency, Frequency, Monetary)**

   Used in marketing and CRM:

   - **Recency**: How recently a user interacted
   - **Frequency**: How often they interact
   - **Monetary**: How much they spend

These models guide decision-making about **where and how** to improve retention efforts.

2.4.3 Linking Differentiation to Value Proposition

Differentiation is the process of making a product or service distinct in a way that users value. It is a key component of the **Value Proposition Canvas (VPC)** and Business Model Canvas (BMC).

Types of Differentiation:

1. **Functional Differentiation**
   - Unique features, better performance, or speed
   - Example: Google's fast and minimal search experience
2. **Emotional Differentiation**
   - Brand identity, tone, or visual appeal
   - Example: Apple's emphasis on creativity and premium feel
3. **Experiential Differentiation**
   - Service quality, onboarding flow, customer support
   - Example: Zappos' famously user-centric customer service
4. **Pricing and Access Differentiation**
   - More affordable or accessible than alternatives
   - Example: Spotify offering freemium access before upselling

A strong **value proposition** communicates how the product's differentiation **solves the user's problem better than competitors**.

Example:

Duolingo differentiates through gamification and habit-building, which aligns with user needs for motivation and short learning bursts—improving both engagement and retention.

2.4.4 Case Examples of Differentiation and Retention Strategies

Case 1: Netflix – Personalisation as Differentiation

- **Differentiation Strategy:**
  Uses advanced recommendation algorithms and seamless cross-device experience.
- **Retention Strategy:**
  High-frequency content updates, original programming, and user data analytics to keep content relevant.
- **Result:**
  High retention and low churn rates among binge-watchers.

Case 2: Swiggy – Service Reliability and Customer Support

- **Differentiation Strategy:**
  Real-time order tracking, verified delivery timelines, and restaurant reliability ratings.
- **Retention Strategy:**
  Loyalty programs (Swiggy Super), personalised offers, and quick resolution of complaints.
- **Result:**
  Increased repeat orders and improved brand trust in a competitive delivery market.

Case 3: Canva – Accessible Design Tools for Non-Designers

- **Differentiation Strategy:**
  Easy drag-and-drop editor with professional templates.
- **Retention Strategy:**
  Cloud-based storage, team collaboration, and educational content.
- **Result:**
  High engagement among freelancers, educators, and marketers, leading to paid conversions.

These examples demonstrate how combining **differentiation with well-structured retention models** leads to competitive advantage and sustainable growth.

2.5 Conducting Field Research

Field research is a core practice in human-centred design and qualitative research, where data is collected directly from users in their natural environments. Unlike lab-based or remote research, field research captures **real-world behaviours, contextual factors, and environmental influences** that impact how people interact with products, services, or systems.

Effective field research bridges the gap between assumptions and reality, providing actionable insights that inform design decisions.

2.5.1 Planning and Designing Field Studies

Field research must be planned carefully to balance **depth of insights, practical feasibility, and ethical responsibility**. A well-structured study ensures that the data collected is relevant, usable, and grounded in the lived experiences of users.

Key Steps in Planning:

1. **Define Research Objectives**
    - What are you trying to learn?
    - Which user behaviours or contexts need to be observed?
2. **Identify Target Participants and Contexts**
    - Who are the users?
    - Where does the behaviour happen?
3. **Select Research Methods**
    - Observations, contextual inquiry, interviews, surveys, etc.
4. **Prepare Research Tools**
    - Interview guides, consent forms, data recording templates
5. **Pilot the Study**
    - Conduct a small-scale trial to test logistics and refine tools
6. **Plan for Documentation**
    - Decide how notes, recordings, and visual data will be captured and stored

Example:

A team studying rural mobile banking usage might choose to visit village markets and homes, observing phone usage, asking contextual questions, and tracking transaction behaviours.

"Activity: Design a Field Research Plan"

Imagine your team is designing a solution to improve the lunch experience on your campus.

- Identify **2 user groups** you need to research (e.g., students, cafeteria staff).
- Write down the **research objectives** (what you want to learn).
- Choose **2 research methods** (e.g., observation, short interviews) and explain why you chose them.
- Create a **data collection plan**: when, where, and how will you collect the data? Submit your plan in a short document (max 1 page) that clearly outlines your approach.

2.5.2 Tools for Real-World Data Collection

Field researchers rely on a mix of **analog and digital tools** to collect data efficiently and accurately, while minimising disruption to participants.

Common Tools:

1. **Notebooks and Field Journals**
    - Used to capture observations, sketches, and immediate reflections
2. **Audio and Video Recorders**
    - Ideal for interviews and walkthroughs, especially when nuance or tone is important
    - Requires consent
3. **Mobile Apps and Digital Forms**
    - Tools like Google Forms, KoBoToolbox, or SurveyMonkey for structured data collection
4. **Voice-to-Text Apps**
    - Useful for quick transcription or real-time notes
5. **Photography (with Permission)**
    - Captures environmental details, workflows, or spatial setups
6. **Environmental Scanning Tools**
    - Measuring foot traffic, light levels, noise, or accessibility features

Choosing the Right Tool:

Tool selection depends on:

- The research context (urban vs rural, indoor vs outdoor)
- Participant literacy or tech comfort

- Ethical and privacy constraints

2.5.3 Ethical Considerations in Field Research

Ethics are **central to field research**, especially because the research takes place in personal, public, or sensitive environments.

Key Ethical Principles:

1. **Informed Consent**
    - Participants must understand the purpose of the research and voluntarily agree to take part.
2. **Anonymity and Confidentiality**
    - Protect participant identities and personal information in all documentation and reporting.
3. **Voluntary Participation**
    - Participants should feel free to withdraw at any point, without consequences.
4. **Minimising Harm and Disruption**
    - The research process should not interfere with people's routines, work, or safety.
5. **Cultural Sensitivity and Respect**
    - Adapt communication and behaviour to align with local customs and norms.

Example:

When conducting interviews with community health workers, ensure that they are not pulled away from patient care, and that privacy is maintained for any sensitive topics discussed.

2.5.4 Challenges of Conducting Research in Real Contexts

Field research can yield powerful insights, but it also presents unique **practical and methodological challenges**.

Common Challenges:

1. **Access and Logistics**
    - Gaining permission to enter communities, workplaces, or institutions
    - Travel time, cost, and safety in remote or unfamiliar settings
2. **Unpredictability**
    - Participants may be unavailable, environments may change, or weather may interfere
3. **Observer Effect**

- People may change their behaviour when they know they are being observed

4. **Language and Communication Barriers**
   - Local dialects, low literacy, or cultural differences may impact understanding
5. **Data Management and Security**
   - Organising, backing up, and safely storing field data is time-consuming and essential
6. **Ethical Dilemmas**
   - Unexpected emotional distress, social sensitivities, or power dynamics may arise

Strategies to Address Challenges:

- Build local partnerships for access and cultural guidance
- Use triangulation to cross-validate findings
- Be flexible and adaptive in research plans
- Debrief regularly and update protocols as needed

Field research is as much about **planning and responsiveness** as it is about technical skill. The quality of insights depends on a researcher's ability to navigate complexity with **empathy, respect, and critical thinking**.

2.6 Synthesising User Insights

Collecting data during field research is only the first step. The **real value emerges when raw data is synthesised into meaningful insights** that can guide design decisions. Synthesis involves identifying patterns, framing user experiences, and translating observations into opportunity areas for innovation.

2.6.1 Organising Data into Themes

After field research, researchers often face a large volume of unstructured information—field notes, quotes, photos, transcripts, and observations. The first step in synthesis is to organise this data into **themes** or **categories** that reveal shared user behaviours, needs, and pain points.

Steps to Organise Data:

1. **Review All Data Sources**
   Go through interview transcripts, observation notes, and recordings.
2. **Extract Key Statements and Observations**
   Highlight meaningful quotes, actions, or emotions that reveal user thinking or challenges.

3. **Code the Data**

   Assign labels or "codes" to similar types of information (e.g., "confusion with app", "delayed service", "trust in staff").

4. **Cluster Similar Codes into Themes**

   Group codes that relate to a broader user concern or pattern. Themes might include:

   - Navigation challenges
   - Lack of trust
   - Resource constraints
   - Emotional stress

Example:

If several users mention difficulty understanding medical instructions, the emerging theme might be **"communication barriers in healthcare services"**.

Themes help convert scattered observations into structured knowledge that can inform personas, journey maps, or design requirements.

2.6.2 Affinity Mapping for Pattern Recognition

Affinity mapping, also known as **affinity diagramming**, is a powerful and widely used method in user research and design synthesis for organizing large volumes of **qualitative data**. The technique helps teams uncover patterns, identify themes, and develop insights by visually clustering related observations, ideas, or data points. It is particularly effective in the early stages of problem framing or during the analysis phase of user-centered design processes, where the goal is to make sense of ambiguous or unstructured information.

The process begins with collecting and writing **individual data points**—such as interview quotes, field observations, survey responses, or usability findings—each on a separate sticky note or digital equivalent. These individual notes are then physically or virtually arranged in a shared space, often on a wall, whiteboard, or collaborative platform. The key principle of affinity mapping is to group data points based on **natural relationships**, rather than pre-defined categories or taxonomies. This encourages an **emergent and bottom-up** approach to pattern recognition, where insights are derived directly from the data rather than imposed by prior assumptions.

Once the notes are clustered based on perceived similarity, the team assigns **descriptive labels** to each group. These labels, often referred to as **themes or insight statements**, summarize the core idea that unites the clustered items. This step requires interpretation and abstraction, pushing the team to identify what

connects the grouped observations at a conceptual level. After labeling, the team engages in **discussion and refinement**, reviewing the overall structure to ensure that the groupings make sense, identifying any outliers or overlaps, and potentially reorganizing the data as new insights emerge.

Affinity mapping offers several benefits. First, it is **highly collaborative**, allowing teams from diverse backgrounds to contribute their perspectives and interpretations, which enhances the richness and reliability of the analysis. Second, it is particularly useful for revealing **hidden relationships, contradictions, or unexpected user needs** that may not be obvious from linear analysis. Third, the method helps design teams develop a **shared mental model** of user problems, aligning stakeholders around key themes and priorities for further exploration or prototyping.

A typical use case for affinity mapping might involve a **design team analyzing field research** from users of a public transportation app. Notes like "the bus route map is confusing," "I missed my transfer," and "I couldn't locate the nearest bus stop" might be grouped under a theme such as **"Wayfinding Frustrations."** Other clusters could include themes like "Lack of Real-Time Updates" or "Accessibility Challenges," depending on the nature of the data collected. This kind of clustering enables the team to identify key opportunity areas for design intervention and to prioritize user pain points based on frequency, severity, or strategic relevance.

In academic and professional practice, affinity mapping is commonly used in disciplines such as **human-centered design, service design, UX research, ethnography**, and **participatory design**. It can be applied not only in product development but also in areas such as healthcare, education, and policy-making, where qualitative understanding is critical for designing impactful interventions.

In conclusion, affinity mapping is an essential method for making sense of qualitative data in a visual, participatory, and insightful manner. It helps design teams move from raw observations to meaningful insights by fostering a structured yet flexible approach to pattern recognition. By encouraging collaboration and reflection, affinity mapping lays the groundwork for more informed decision-making and user-centered innovation.

Activity:

Interview 3 people about their recent experience using a public service (e.g., visiting a hospital, using public transport, applying for a government document).

- Extract **at least 10 key statements or observations** from your conversations.
- Write each statement on a separate sticky note (or digital note).
- Group similar notes together based on meaning or theme.

- Label each group with a common theme (e.g., “long wait times”, “confusing process”). Submit a photo or digital screenshot of your final affinity map and a short paragraph explaining two major themes you discovered.

2.6.3 Creating Journey Maps for User Experiences

A **user journey map** is a visual tool that helps design teams understand and communicate the **end-to-end experience of a user**, including their goals, actions, emotions, and pain points across different stages of interaction.

Components of a Journey Map:

- **Stages or Phases**: Key moments in the user’s interaction (e.g., discover → onboard → use → resolve)
- **User Actions**: What the user is doing at each stage
- **Emotions or Thoughts**: How the user feels or thinks during each phase
- **Touchpoints**: Where the user interacts with the system (e.g., website, customer support, store)
- **Pain Points**: Frustrations or barriers at each step
- **Opportunities**: Areas where improvement or innovation is possible

Purpose:

- Reveal the user’s experience over time
- Identify breakdowns in service or usability
- Uncover emotions that quantitative data may miss

Example:

Mapping the journey of a first-time online shopper might reveal:

- Excitement during browsing
- Confusion during checkout
- Anxiety about delivery
- Relief upon product arrival

Journey maps help design teams empathise with users and prioritise improvements across the experience lifecycle.

2.6.4 Translating Research Insights into Opportunity Areas

After identifying patterns and mapping experiences, the final step is to **translate insights into actionable design directions**, also known as **opportunity areas**.

What Are Opportunity Areas?

These are broad, insight-driven problem spaces that:

- Reflect real user needs or pain points
- Are aligned with business objectives
- Provide direction for ideation or prototyping

They are typically framed as **"How Might We" (HMW) questions** that are open-ended but focused.

Steps:

1. **Review Key Insights and Pain Points**
2. **Ask: What is the user really trying to achieve? What's blocking them?**
3. **Frame HMW Questions** to encourage solution exploration

Examples:

- Insight: Users avoid mobile banking due to fear of security breaches
  → *How might we build trust and confidence in mobile banking for first-time users?*
- Insight: Teachers in remote areas feel isolated and unsupported
  → *How might we provide a sense of community and peer learning for rural educators?*

Opportunity areas act as **bridges between research and ideation**, ensuring that solution concepts are grounded in real user insight.

Knowledge Check 1

Choose the correct option:

1. What is the main goal of problem framing in the design process?
   A. To identify a final solution early
   B. To define the clearest and most valuable problem to solve
   C. To write user requirements
   D. To prioritise business goals only

2. Which of the following is a key principle of **contextual inquiry**?
   A. Remote interviews
   B. Controlled lab experiments
   C. Observing users in their natural environment
   D. Anonymous surveys
3. In the **Theory of Change**, which element refers to long-term systemic transformation?
   A. Outputs
   B. Activities
   C. Impact
   D. Inputs
4. What is the purpose of **affinity mapping**?
   A. To collect numerical data
   B. To group related insights and identify patterns
   C. To measure user satisfaction
   D. To conduct market segmentation
5. Which of the following is a *business problem*, not a user problem?
   A. App takes too long to load
   B. Users don't understand payment options
   C. High user churn after onboarding
   D. Confusing checkout process

2.7 Summary

This module has explored the essential processes and mindsets involved in **framing problems and conducting user research** in real-world contexts. Beginning with identifying **problems worth solving**, it introduced theoretical tools such as **Problem Theory** and **Theory of Change**, and followed through with hands-on approaches like **contextual inquiry**, **ethnographic research**, and **field data collection**.

The importance of distinguishing between user problems and business problems was highlighted in the discussion on **differentiation and retention models**, ensuring that solutions are both user-centred and

strategically aligned. The final sections introduced techniques for **synthesising user insights** through affinity mapping, journey mapping, and translating findings into actionable opportunity areas.

Together, these tools and frameworks equip learners and practitioners to design interventions that are meaningful, evidence-based, and deeply rooted in user realities.

2.8 Key Terms

1. **Problem Framing**
   Figuring out exactly what problem needs to be solved, instead of jumping to solutions too early.
2. **Problem Theory**
   A way of understanding how problems are formed, how people see them, and how they can be analysed.
3. **Theory of Change (ToC)**
   A step-by-step plan that explains how your actions will lead to the results or changes you want.
4. **Contextual Inquiry**
   Watching and talking to people in their real environment while they do their usual tasks.
5. **Ethnographic Research**
   Spending time with people in their real settings to deeply understand their behaviours, culture, and routines.
6. **Affinity Mapping**
   A method where you group similar ideas or findings (often on sticky notes) to spot patterns and themes.
7. **User Journey Map**
   A visual chart showing what a user does, feels, and experiences at each step while using a product or service.
8. **Opportunity Area**
   A space or idea that comes from research where there's a chance to make something better or solve a real problem.
9. **Retention Model**
   A way to understand and improve how well a product keeps users coming back over time.
10. **Differentiation**
    What makes your product or service stand out from others in a way that matters to the user.

2.9 Descriptive Questions

1. Explain the difference between surface-level symptoms and root problems. Give a real-world example from education or healthcare.
2. What is the Theory of Change, and how can it be applied in a design project aimed at improving access to online education?
3. Compare and contrast contextual inquiry and ethnographic research. In what contexts would each method be most effective?
4. How can affinity mapping support a design team during the synthesis phase of user research?
5. Discuss the relationship between user problems and business problems. Why is it important to address both in service design?
6. Describe how user journey maps can help uncover emotional and functional pain points in a service.
7. What are some common challenges in conducting field research, and how can they be mitigated?
8. How can customer retention strategies be aligned with the value proposition of a digital service?
9. Define what is meant by an "opportunity area" in user research and explain how it links research to ideation.
10. How might you ethically collect user feedback in a community with low digital literacy and limited access?

2.10 References

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Answers to Knowledge Check

Knowledge Check 1

1. B To define the clearest and most valuable problem to solve
2. C Observing users in their natural environment
3. C Impact
4. B To group related insights and identify patterns
5. C High user churn after onboarding

2.11 Case Study

Swiggy's User Research – From Ethnographic Studies to Customer Retention Strategies

Background:

Swiggy, one of India's largest food delivery platforms, faced a major challenge in 2017: **high drop-off rates among first-time users**. Many users installed the app, placed a single order, and never returned. The business team saw this as a **retention issue**, but the product and design teams wanted to investigate deeper.

Research Approach:

Swiggy deployed a **cross-functional research team** across five Indian cities to conduct **ethnographic research and contextual inquiry** with users, delivery partners, and restaurant staff.

Key Methods Used:

- Home visits and interviews with users
- Shadowing delivery executives in different weather and traffic conditions
- Affinity mapping to synthesise feedback
- Surveys to validate emerging themes

Findings:

1. **First-time users felt overwhelmed by too many options** and unclear categories.
2. **Delivery wait time anxiety** was a recurring emotional pain point.
3. Many users in Tier-2 cities **preferred COD (Cash on Delivery)** due to low trust in digital payments.
4. Delivery partners highlighted **navigation issues and peak-hour pressure** affecting order timings.

Solutions Implemented:

- Streamlined onboarding and search flow
- Real-time order tracking with estimated delivery time

- Simplified menu categories and localised content
- Loyalty program (Swiggy Super) and targeted re-engagement campaigns
- Partner training and route optimisation tools

Impact:

- **Repeat order rates increased by 35%** within six months.
- **Customer satisfaction scores improved**, especially on delivery time perception.
- The case became an internal benchmark for Swiggy's design-led decision-making culture.

Unit 3: Understanding Service Ecosystems

Learning Objectives

1. Define the structure and functions of the money market, distinguishing it from capital markets.
2. Identify and describe the characteristics, participants, and instruments of the Indian money market.
3. Explain the features, maturity periods, and issuance process of Treasury Bills (T-Bills) and Commercial Papers (CP).
4. Compare different short-term money market instruments such as Commercial Bills, Certificates of Deposit (CDs), and Call/Notice Money, focusing on liquidity, risk, and yield.
5. Illustrate how Collateralised Borrowing and Lending Obligations (CBLO) function in secured interbank lending, including the role of collateral.
6. Evaluate the suitability of different money market instruments for banks, corporates, and government entities in managing short-term funding requirements.
7. Apply knowledge of money market operations to interpret market trends and assist in short-term investment or borrowing decisions.

Content

3.0 Introductory Caselet

"Project SaafPaani: Designing for Clean Water Access in Urban Slums"

An interdisciplinary design team is working on **Project SaafPaani**, an initiative aimed at improving access to clean drinking water in a densely populated urban slum in Delhi. The area is served by a mix of municipal taps, informal water vendors, and illegal borewells. However, residents still face irregular supply, contamination, and long wait times.

During initial field visits, the team discovers that several groups have **conflicting interests**:

- Local women, who manage water collection daily
- Private vendors, who profit from selling water
- Municipal officials, under pressure to show infrastructure improvements
- Community health workers, concerned about rising cases of waterborne disease
- Local youth groups, interested in sustainability and innovation

The design team realises that to develop a meaningful and accepted solution, they need to identify all stakeholders, understand their roles, interests, and power dynamics, and manage potential conflicts before ideating solutions.

Critical Thinking Question:

Why is it important to include both formal and informal stakeholders in this type of design project? How might ignoring certain groups affect the success of the intervention?

3.1 Stakeholder Mapping

Stakeholder mapping is a strategic activity used to identify all individuals, groups, or organisations that have an interest or influence in a project. In human-centred design and systems thinking, stakeholder mapping is crucial for understanding the **ecosystem** in which a solution will operate.

Without involving the right stakeholders, design interventions may face resistance, lack legitimacy, or fail to scale.

3.1.1 Identifying Stakeholders in Service Ecosystems

A **service ecosystem** includes all the people, organisations, and systems involved in delivering, regulating, supporting, or consuming a service.

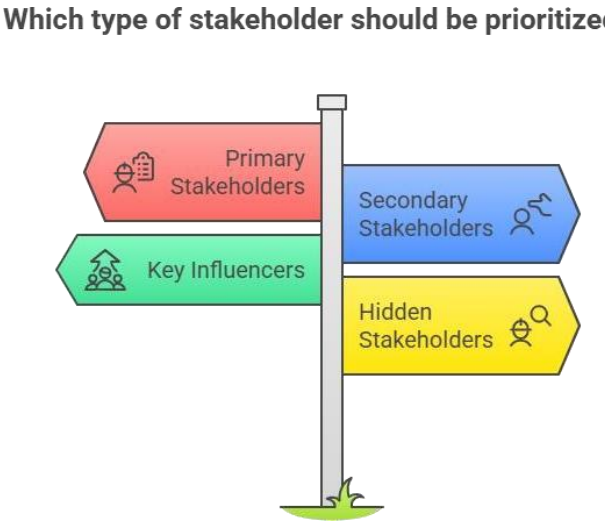

Figure 3.1

Types of Stakeholders:

1. **Primary Stakeholders** – Directly use or interact with the service
    - Example: Customers, service users, staff
2. **Secondary Stakeholders** – Indirectly involved or impacted
    - Example: Regulators, suppliers, maintenance staff
3. **Key Influencers** – Have power over decisions or adoption
    - Example: Government officials, funders, media
4. **Hidden Stakeholders** – Not always visible, but influential
    - Example: Local leaders, informal vendors, cultural figures

How to Identify:

- Review the full service delivery flow
- Conduct field visits or interviews
- Ask: “Who cares if this succeeds or fails?”
- Use tools like stakeholder lists or ecosystem maps

3.1.2 Stakeholder Needs and Expectations

Understanding stakeholder needs and expectations is **critical for project success**. Each stakeholder group brings its own **motivations, concerns, goals, and definitions of value**. Ignoring or misunderstanding these perspectives can lead to **resistance, delays, scope creep, or even project failure**.

Why Stakeholder Needs Matter

Stakeholders influence project decisions, resources, direction, and long-term sustainability. Projects that actively listen to and engage stakeholders tend to:

- Increase **trust** and **buy-in**
- Identify **hidden risks** early
- Achieve **faster approvals** and **smoother implementation**
- Create **user-centered outcomes** that are more likely to be adopted

Key Areas to Explore

When identifying and analyzing stakeholder needs, consider:

Exploration Area	Examples
What does the stakeholder want to achieve?	Convenience, recognition, efficiency, cost savings, social impact
What are their fears or concerns?	Loss of control, reputational damage, increased workload, data misuse
What are their expectations from the project?	Transparency, timely updates, return on investment, inclusion in decision-making

Example: Healthcare Design Project

In a healthcare digital transformation initiative, stakeholders may include:

- **Patients:**
  • Need faster access to care, empathy, and privacy

  - • Fear long wait times, data breaches
  - • Expect user-friendly systems and clear communication
- **Doctors/Nurses:**
  - • Need reduced manual tasks, reliable data, clinical decision support
  - • Fear poorly designed systems that interrupt workflows
  - • Expect training, consultation during design, and system reliability
- **Administrators:**
  - • Need budget control, compliance, and operational efficiency
  - • Fear cost overruns or legal risks
  - • Expect performance dashboards and regulatory alignment
- **IT Department:**
  - • Need technical feasibility, security, and scalable infrastructure
  - • Fear legacy system integration issues or unrealistic deadlines
  - • Expect clear technical specifications and resource planning

Mapping and understanding these layers ensures that **no group feels ignored**, and all groups feel the project **reflects their voice**.

Approaches to Understanding Stakeholder Needs

- **Stakeholder Interviews & Surveys:** Collect qualitative insights directly
- **Empathy Mapping:** Visualize what stakeholders say, think, feel, and do
- **Personas:** Develop composite profiles to represent key stakeholder groups
- **Stakeholder Prioritization Matrix:** Categorize stakeholders by power and interest
- **Workshops & Co-design Sessions:** Involve stakeholders in ideation and decision-making

Common Pitfalls to Avoid

- Assuming all stakeholders have the **same priorities**
- Engaging stakeholders only at the **beginning or end** of the project
- Overlooking **indirect stakeholders** (e.g., support staff, end-users' families)
- Focusing solely on **business needs**, ignoring **emotional or social** aspects

Benefits of Addressing Stakeholder Needs Early

- Improves **adoption and satisfaction**
- Minimizes **conflict and resistance**
- Enhances **project relevance and usability**

- Encourages **long-term support** and **feedback loops**

3.1.3 Power, Influence, and Relationship Analysis

Not all stakeholders are equal in their ability to shape project outcomes. Some hold **decision-making authority**, others can **mobilize public opinion**, while others are **directly impacted** but lack a voice. Understanding how power and influence are distributed—and how stakeholders relate to each other—is essential for **strategic engagement** and **risk mitigation**.

Power–Influence Matrix

A **Power–Influence Matrix** (also called Power–Interest Grid or Influence Map) helps teams classify stakeholders based on:

- **Power**: The ability to control decisions, access resources, or enforce rules
- **Influence**: The ability to sway opinions, gather support, or mobilize resistance

Category	Characteristics	Example Stakeholders
High Power, High Influence	Key decision-makers; require active engagement	Funders, policymakers, government agencies
High Power, Low Influence	Gatekeepers or silent blockers; must be monitored	Legal authorities, regulatory boards
Low Power, High Influence	Vocal, mobilized groups; can shape public perception	Local activists, media, online communities
Low Power, Low Influence	May not influence decisions but are impacted; require empathy	Marginalized communities, children, daily users

Engagement Strategy:

- **Collaborate** with high power–high influence stakeholders
- **Consult and monitor** high power–low influence stakeholders
- **Engage and empower** low power–high influence stakeholders
- **Inform and empathize** with low power–low influence stakeholders

Relationship Mapping

Stakeholders don't operate in isolation—they have **networks of relationships** that can either **support or block** your project.

Relationship mapping helps you:

- Visualize **interactions**, **alliances**, and **dependencies**

- Spot potential **conflicts** or **coalitions**
- Understand **who influences whom**, formally or informally
- Discover **gatekeepers** and **trusted connectors**

Tools you can use:

- **Stakeholder network diagrams**
- **Influence flowcharts**
- **Social network maps**

Example: Project SaafPaani (Clean Water Initiative)

Stakeholder	Power	Influence	Relationship Insights
Water vendors	Medium	Medium–High (through resistance)	May feel threatened by new infrastructure; could organize opposition
Local women	Low	Medium–High (as primary users)	Key users of the service; often overlooked but have deep contextual knowledge
Municipal officers	High	High	Decision-makers for infrastructure; potential champions or blockers depending on buy-in
Community leaders	Medium	High	Act as trust bridges between project teams and the public
NGOs	Low–Medium	Medium	May advocate for marginalized voices or help in capacity building

Adding Depth: Beyond Power and Influence

While power and influence are important, also consider:

Dimension	Description	Relevance
Legitimacy	Do stakeholders have a recognized claim or moral authority?	May lack formal power but hold social legitimacy (e.g., elders, faith leaders)
Urgency	How time-sensitive are their needs?	Stakeholders in crisis may require early attention
Engagement Willingness	Are they open to collaboration?	Some may resist or be disengaged

This multidimensional approach is often referred to as **Mitchell's Stakeholder Salience Model**, which combines **Power, Legitimacy, and Urgency** to prioritize stakeholders more accurately.

Why This Analysis Matters

Failing to understand stakeholder dynamics can lead to:

- **Unanticipated resistance or sabotage**
- **Unbalanced representation** in design and decisions
- **Poor resource allocation** for engagement
- **Delays or failure** in project rollout

Conducting a **comprehensive stakeholder analysis** upfront supports:

- Inclusive planning
- Targeted communication
- Conflict resolution
- More sustainable, accepted solutions

3.1.4 Visual Tools for Mapping Stakeholders

Visual tools help teams **organise, analyse, and communicate** stakeholder information effectively.

Common Tools:

1. **Stakeholder Power–Interest Grid**
    - Plots stakeholders based on their level of **power** and **interest**
    - Guides how to manage each group (e.g., inform, consult, involve, collaborate)
2. **Stakeholder Ecosystem Map**
    - Shows the full system of actors, institutions, and service flows
    - Helps visualise dependencies and indirect relationships
3. **Influence Network Diagrams**
    - Maps influence pathways and decision-making chains
    - Useful in complex governance or political contexts
4. **Empathy Maps (for key stakeholders)**
    - Captures what a stakeholder **thinks, feels, says, and does**
    - Helps deepen understanding of needs and motivations

Benefits of Visual Mapping:

- Makes abstract relationships visible
- Supports team alignment and shared understanding
- Encourages systems thinking
- Provides a reference for co-design planning and conflict management

3.2 Touchpoint Mapping

Touchpoint mapping is a key method in service design and customer experience research. It involves identifying and analysing all the **interactions (touchpoints)** a user has with a service across time, platforms, and channels. This technique helps teams understand the **end-to-end customer journey**, reveal gaps or friction in the experience, and discover **opportunities for innovation**.

3.2.1 Defining Customer Touchpoints

Customer touchpoints are any moments where a customer interacts with a brand, service, or product—before, during, or after their core service experience.

Types of Touchpoints:

1. **Pre-service**
    - Advertising, word of mouth, social media posts, website, app download
2. **During service**
    - In-store experience, app usage, customer service, payment process
3. **Post-service**
    - Follow-up emails, support tickets, feedback forms, loyalty programs

Touchpoints can be:

- **Digital** (e.g., website, chatbot)
- **Physical** (e.g., packaging, store signage)
- **Human** (e.g., call centre agent, delivery staff)

Importance:

- Touchpoints shape customer perceptions, emotions, and satisfaction.
- A single poor touchpoint (e.g., delayed delivery) can affect the entire brand experience.

3.2.2 Mapping the Customer Journey

A **customer journey map** is a visual representation of the customer's interactions with a service across all stages. It illustrates what users **do, feel, and think** at each step, making invisible aspects of the experience visible.

Steps to Create a Journey Map:

1. **Define the user persona or target group**
2. **List the major stages** of the journey (e.g., Discover → Consider → Purchase → Use → Support)
3. **Identify touchpoints** at each stage
4. **Capture user actions, emotions, and thoughts** at each touchpoint
5. **Highlight pain points, moments of delight, and gaps**
6. **Include channels used** (e.g., mobile app, phone call, in-person)

Example Journey Stage (Food Delivery App):

- **Stage:** Order placement
- **Touchpoints:** App interface, search bar, menu filters
- **User Action:** Browses for items
- **Emotion:** Frustration due to poor categorisation
- **Opportunity:** Improve menu filtering UX

Journey maps help cross-functional teams (design, ops, tech) understand the **holistic user experience** and make improvements that matter.

"Activity: Map a Real-World Customer Journey of a Daily Service"

Instruction to Student:

Choose a service you interact with regularly (e.g., a food delivery app, metro transport, or online banking). Map your end-to-end journey by identifying at least **five key stages** (e.g., Discovery, Selection, Transaction, Use, Support).

For each stage, note:

- The **touchpoints** (e.g., app interface, delivery person)
- Your **actions**
- Your **emotions**
- Any **pain points or delights**

Then suggest **one improvement** for the stage with the highest frustration.

Submit your map in a visual or tabular format.

3.2.3 Identifying Pain Points and Opportunities

After mapping the **user journey**, the next critical step is to **identify pain points**—specific stages or touchpoints where users experience **friction, frustration, or confusion**. Addressing these pain points is essential for **improving user satisfaction**, increasing **conversion rates**, and discovering **design opportunities** that can create lasting impact.

What Are Pain Points?

Pain points are moments in the user experience that cause:

- **Delay or confusion**
- **Unmet expectations**

- **Emotional stress or frustration**
- **Drop-offs or abandonment**

These can be functional (e.g., a broken button), emotional (e.g., feeling ignored), or systemic (e.g., unclear policies).

Common Pain Points Across Sectors

Category	Examples
Process Delays	Long waiting times, multi-step approvals, slow responses
Usability Issues	Complicated forms, poor navigation, non-mobile-friendly UI
Communication Gaps	Inconsistent or unclear messaging, jargon-heavy content
Support Barriers	Lack of help channels, automated systems with no escalation
Payment Friction	Limited payment options, unclear billing, technical errors

How to Identify Pain Points

Use a combination of **qualitative** and **quantitative** methods:

1. **User Interviews & Surveys**
   Ask users directly: "Where did you feel stuck?" or "What frustrated you the most?"
2. **Observation & Usability Testing**
   Watch users interact with your system or service—observe body language, hesitations, and workarounds.
3. **Data Analysis**
   Use analytics to identify drop-off points, time-on-task issues, or bounce rates.
4. **Support Tickets & Complaint Logs**
   Categorize recurring themes from helpdesk interactions or customer feedback forms.
5. **Social Listening & Reviews**
   Monitor app store reviews, social media posts, or forum discussions for spontaneous feedback.

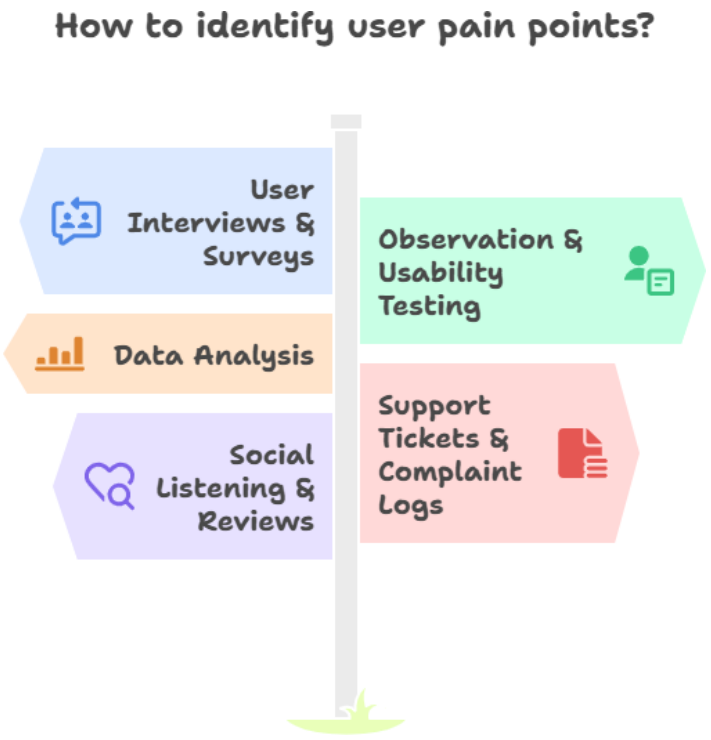

Figure 3.2

Identifying Opportunities

Not all insights are negative. Pain points often signal **opportunities for innovation or improvement**.

Opportunity Zones:

- **High-Impact Stages**: Critical touchpoints where experience influences user trust or loyalty (also called "Moments of Truth").
- **Low-Effort Fixes**: Small design tweaks (e.g., tooltips, layout improvements) that significantly reduce user frustration.
- **Unmet Needs**: When users express needs that are currently not supported by the system.
- **Inefficient Workarounds**: Users develop their own ways to overcome issues—these often reveal opportunity areas.
- **Negative Emotions**: Anger, anxiety, or disappointment indicates emotional opportunities for empathy-driven solutions.

Real-World Example

Scenario:

A public utility app experiences a **high dropout rate** during the bill payment process.

- **Pain Point**: Users abandon carts at the payment step due to complex CAPTCHA and limited payment gateways.
- **Identified Through**: Analytics and user feedback surveys.
- **Opportunity**:
    - Simplify payment flow (e.g., auto-filled forms, fewer steps)
    - Add multiple payment methods, including UPI and "Pay on Delivery"
    - Improve error messages and real-time help during payment
    - Use a **progress indicator** to show how many steps are left

Case-in-Point: Healthcare Kiosk Redesign

- **Pain Point**: Elderly users struggle with digital check-in kiosks.
- **Opportunity**: Introduce voice-guided assistance, larger buttons, and on-site human support to guide first-time users.

Aligning Pain Points with Business Objectives

Pain points also have **cost implications**:

- Increased **support center volume**
- Lost revenue due to **abandoned transactions**
- Reduced **user retention** and **referrals**

By **quantifying the cost of pain points** and linking improvements to KPIs (e.g., conversion, satisfaction scores), teams can make a strong case for change.

Best Practices

- **Map pain points to the journey stages** (awareness, consideration, onboarding, use, support, exit)
- **Prioritize** pain points by severity and frequency
- Involve **cross-functional teams** (designers, developers, support staff) in ideation
- Validate solutions through **prototype testing and iteration**

3.2.4 Case Applications of Touchpoint Mapping

Touchpoint mapping is used across industries to improve customer experience, service flow, and retention. Below are a few examples:

Case 1: Swiggy – Improving Delivery Communication

- **Problem:** Users complained about unpredictability in delivery time.

- **Touchpoint Mapping Result:** Identified that users had no updates between "order placed" and "order picked."
- **Outcome:** Added real-time GPS tracking and progress updates, leading to higher user trust and reduced complaints.

Case 2: IRCTC (Indian Railway Booking Site) – Redesigning UX

- **Problem:** Users found the booking process complex and prone to failure.
- **Journey Mapping Insights:** Major drop-offs at payment stage, poor mobile compatibility.
- **Outcome:** Revamped payment flow, mobile app prioritised, simplified retry system.

Case 3: Hospital Experience – Outpatient Visit

- **Mapped Touchpoints:** Registration, waiting area, nurse interaction, doctor consultation, billing
- **Pain Points Identified:** Long queues, unclear wayfinding, rushed consultations
- **Opportunities:** Digital registration kiosks, better signage, staff training for empathy

Touchpoint mapping provides clarity on how a service is experienced **from the user's perspective**, enabling targeted and meaningful improvements. It supports teams in designing services that are not just functional—but also emotionally resonant and frictionless.

3.3 Frontstage vs. Backstage Interactions

In service design, interactions are not limited to what the customer sees. Many crucial activities happen **behind the scenes**, supporting the visible experience. Understanding the difference between **frontstage** (what users see) and **backstage** (what supports it) is essential for designing services that are both **user-friendly** and **operationally efficient**.

3.3.1 Distinction Between Visible and Invisible Service Components

In any service experience, two layers operate simultaneously: the **visible** components that users interact with (frontstage), and the **invisible** components that make the service work behind the scenes (backstage). Understanding this distinction is vital for **designing efficient, user-friendly, and reliable service systems**.

Frontstage (Visible Service Components)

The **frontstage** includes everything the user **sees, hears, or interacts with** during the service experience. It shapes the **user's perception**, emotions, and satisfaction levels.

Characteristics:

- **Customer-facing**: All direct interactions with users

- Includes **human**, **physical**, and **digital** elements
- Affects **brand image**, **trust**, and **usability**

Examples:

- A delivery person handing over a package with a smile
- A mobile app interface used to book a cab
- A receptionist helping visitors in a hospital
- Hotel room interiors and cleanliness
- Restaurant menu design and waiter service

Design Considerations:

- Is the experience **intuitive and smooth**?
- Are touchpoints **consistent** with brand expectations?
- Do users feel **heard, guided, and respected**?

Backstage (Invisible Service Components)

The **backstage** includes all the **people, systems, technologies, and processes** that enable the frontstage experience but are not visible to the user.

Characteristics:

- Operates **behind the scenes**
- Supports **efficiency**, **accuracy**, and **scalability**
- Critical for ensuring **service reliability and delivery**

Examples:

- Dispatch algorithms matching cabs with users
- Inventory management systems in a retail store
- Kitchen staff preparing food based on digital orders
- IT infrastructure maintaining an e-commerce platform
- Medical record systems scheduling hospital appointments

Design Considerations:

- Are backstage systems **integrated** and **responsive**?
- Is there **clear communication** between frontstage and backstage staff?
- Are **errors and bottlenecks** minimized?

Why This Distinction Matters

Aspect	Frontstage	Backstage

User Interaction	Direct	Indirect (or none)
Perception	High impact on user satisfaction	Low visibility but critical for success
Design Focus	User experience, clarity, accessibility	Efficiency, automation, coordination
Example (Cab Service)	Booking screen, driver greeting, rating UI	GPS routing, payment processing, support
Example (Hospital)	Receptionist, signage, waiting area	Patient data systems, staff scheduling

A **flaw in the frontstage** (e.g., a confusing app) frustrates the user, even if the backstage is efficient. A **flaw in the backstage** (e.g., lost data or delays) will **eventually surface** as a broken or delayed frontstage experience.

Real-World Example: Airline Service

- **Frontstage:**
  - Check-in counters, flight attendants, in-flight app, boarding gate announcements
- **Backstage:**
  - Crew scheduling, luggage tracking system, flight control coordination, ticketing database

If backstage operations like baggage routing fail, the frontstage experience—no matter how pleasant—will result in customer dissatisfaction.

Interdependence of Frontstage and Backstage

- A **seamless service** depends on tight coordination between visible and invisible parts.
- **Service blueprints** are often used to map both layers together, aligning user experience with operational systems.
- When designing services, **cross-functional collaboration** is needed—UX designers, engineers, operations managers, and customer support teams must all align.

Opportunities for Innovation

Backstage systems can be enhanced to **unlock better frontstage experiences**, such as:

- Using **AI chatbots** in the backstage to support 24/7 visible support
- Integrating **real-time inventory** to avoid frontstage stock-out frustration
- Creating **automated alerts** to inform users proactively of delays or changes

3.3.2 Role of Employees, Technology, and Processes

Employees:

- **Frontstage roles** (e.g., customer service reps, waiters) require communication and interpersonal skills.
- **Backstage roles** (e.g., kitchen staff, IT support) focus on consistency, accuracy, and efficiency.

Technology:

- Enables automation, integration, and communication between frontstage and backstage.
- Examples: CRMs, inventory systems, payment gateways, scheduling tools

Processes:

- Well-designed processes ensure that **internal operations align with external expectations**.
- Includes standard operating procedures (SOPs), quality checks, feedback loops.

Example in E-commerce:

- Frontstage: Customer tracks order on app
- Backstage: Logistics software assigns delivery, warehouse processes packaging

3.3.3 Service Blueprinting Connections

A **service blueprint** is a **visual mapping tool** that helps organizations understand how different components of a service—**visible and invisible**—work together to create the customer experience. It captures both **user-facing interactions** and **internal processes**, making it a powerful method for identifying **bottlenecks, gaps, redundancies, and opportunities** for improvement.

Purpose of a Service Blueprint

- Connects the **customer journey** with the **internal operations** that support it
- Helps identify **dependencies** between teams, systems, and touchpoints
- Aligns **design, operations, and technology**
- Reveals **potential failure points** that may disrupt service delivery
- Promotes **cross-functional collaboration** during service improvement or innovation

Core Layers of a Service Blueprint

Each layer plays a specific role in revealing the complete service ecosystem:

Layer	Description	Example
1. Customer Actions	Steps taken by the user during the journey	Booking an appointment via a mobile app
2. Frontstage Interactions	Visible interactions between the user and the service provider	Speaking with a receptionist; confirmation pop-up

3. Backstage Interactions	Internal employee actions not visible to the customer	Admin updates schedule in the backend
4. Support Processes	Systems, workflows, or third-party services that support backstage/frontstage	Appointment system syncs with doctor's calendar
5. Physical Evidence	Tangible or digital outputs that shape user perception	Printed ticket, email receipt, SMS notification

How Blueprint Layers Are Connected

Each element in the blueprint **triggers** or **relies on** another. For example:

- A **customer action** (e.g., clicks "Confirm Booking") triggers a **frontstage interaction** (confirmation message), which then relies on a **backstage process** (database entry) supported by a **system API**, and produces **physical evidence** (confirmation email).

If the **backstage system** fails to record the booking correctly, the customer may arrive with **no appointment scheduled**—a classic example of **frontstage failure caused by backstage issues**.

Example: Online Doctor Appointment System

Blueprint Layer	**Touchpoint or Process**
Customer Action	Patient fills form and selects time slot
Frontstage Interaction	Web form submission + success message
Backstage Interaction	Staff receives and verifies appointment
Support Process	Scheduling software cross-checks doctor availability
Physical Evidence	SMS and email confirmation sent to patient

Failure Point Example:

If the **support process** fails to update doctor availability in real-time, **double bookings** occur—leading to long waits or service denial.

Benefits of Service Blueprinting

- **Improves communication** across departments by creating a shared understanding
- Helps spot **operational inefficiencies** and reduce service errors
- Supports **employee training** by showing where their role fits in the bigger picture
- Aids in **scaling services** by clarifying workflows and systems integration
- Enables **customer-centric redesign** by linking internal actions to customer pain points

Best Practices

- Start with a **real customer scenario** (e.g., first-time user, frequent buyer, or complaint case)
- Use **swimlanes** to organize layers clearly
- Map **touchpoints chronologically** to reflect actual flow
- Involve **stakeholders from different teams** in the mapping process
- Annotate with **pain points, improvement ideas, or KPIs** for deeper insight

3.3.4 Aligning Frontstage and Backstage for Seamless Experience

A seamless service experience happens when **frontstage and backstage are aligned**—both technically and operationally.

Key Principles:

1. **Consistency of Information**
    - The data shown to users (e.g., availability) must reflect real-time backend systems.
2. **Timely Communication**
    - If a backstage delay occurs, frontstage communication (e.g., alerts or apologies) must be proactive.
3. **Employee Empowerment**
    - Frontline staff need access to backstage tools or data to resolve issues quickly.
4. **Feedback Loops**
    - Insights from frontstage (e.g., user complaints) should inform backstage process improvements.

Example:

In a hotel, if a room is marked "available" on the website but housekeeping hasn't cleaned it, the guest's experience breaks. Alignment would require:

- Real-time backend updates from housekeeping
- Front desk visibility into room status
- Automatic syncing between systems

Understanding frontstage and backstage interactions ensures that design teams don't just focus on what the user sees, but also **what supports that experience** behind the curtain. Effective service design is about **orchestrating people, technology, and processes** across both fronts.

3.4 Platform Thinking

Platform thinking is a strategic approach to business and service design that focuses on **enabling interactions between multiple user groups**, rather than just delivering products or services. It is the core model behind successful businesses like Amazon, Uber, Airbnb, and Swiggy. Platforms create value by **facilitating connections**—between buyers and sellers, creators and consumers, service providers and users.

3.4.1 Principles of Platform-Based Business Models

A **platform business model** doesn't own the means of production—it **enables value creation and exchange** among users. Instead of a linear supply chain, platforms operate as **ecosystems**.

Core Principles:

1. **Value through Interaction**
   The platform connects users to exchange goods, services, or data (e.g., a driver and rider on Uber).
2. **Network Effects**
   As more users join, the platform becomes more valuable. (E.g., more sellers on Amazon attract more buyers.)
3. **Technology Infrastructure**
   Platforms are powered by scalable digital systems: apps, APIs, recommendation engines, etc.
4. **Data-Driven Personalisation**
   Platforms gather data to improve matches, recommendations, and efficiency.
5. **Minimal Asset Ownership**
   Most platforms don't own inventory (e.g., Airbnb doesn't own rooms).

Examples:

- Uber connects riders and drivers
- YouTube connects creators and viewers
- LinkedIn connects professionals and recruiters

3.4.2 Direct-to-Consumer (D2C) Models

The **Direct-to-Consumer (D2C)** model is a business approach where brands **sell directly to the end customer**, bypassing traditional intermediaries such as wholesalers, distributors, and physical retailers. Enabled primarily by **digital technologies**, this model has transformed how brands reach, engage, and serve their consumers—especially in markets driven by personalization, speed, and brand authenticity.

Key Features of D2C Models

Feature	Description

Brand Ownership	Companies maintain complete control over brand messaging, packaging, and experience
Digital-First Presence	Sales and marketing occur primarily through websites, social media, and apps
Customer Data Access	Direct relationships allow access to user behavior, preferences, and feedback
Personalisation at Scale	Offers can be tailored based on data-driven insights and customer segments
Integrated Supply Chain	Brands manage logistics, fulfillment, and inventory internally or through tech-enabled partners

Benefits of D2C Models

Benefit	Description
Higher Profit Margins	By cutting out middlemen, brands retain a larger share of revenue
Customer Loyalty & Trust	Direct interaction fosters deeper relationships and brand advocacy
Agile Product Innovation	Faster feedback enables quick testing, iteration, and innovation cycles
Data-Driven Marketing	Customer data fuels targeted campaigns, improving ROI
Speed to Market	Brands can launch products or updates rapidly, without retail constraints

Popular Indian D2C Examples

- **boAt (Audio accessories):** Leveraged influencer marketing and youth-oriented branding to become a top lifestyle electronics brand
- **Mamaearth (Personal care):** Used clean beauty positioning and social media storytelling to build trust among millennials
- **Lenskart (Eyewear):** Blended online D2C with in-house physical stores to enhance omnichannel reach
- **Wakefit (Mattresses):** Disrupted furniture retail by offering quality products directly with trial periods and doorstep delivery

How D2C Differs from Traditional B2C

Aspect	D2C Model	Traditional B2C
Sales Channel	Brand-owned platforms (website/app)	Through retailers or third-party sellers
Customer Data	Owned by brand	Owned by retailers
Branding Control	Full control	Shared or diluted
Cost Structure	Fewer intermediaries	Markups added by middlemen

Customer Relationship	Direct and long-term	Indirect and transactional

Challenges in D2C Strategy

Despite its advantages, D2C brands also face a unique set of challenges:

- **Customer Acquisition Cost (CAC):** Digital advertising is highly competitive and expensive
- **Logistics & Fulfillment:** Handling warehousing, last-mile delivery, and returns requires operational excellence
- **Trust Building:** New D2C brands must establish credibility without retail presence
- **Scaling Operations:** Managing growth while maintaining personalized service is complex
- **Retention Over Acquisition:** High churn rates can erode profitability if customer loyalty is not sustained

Trends Shaping the Future of D2C

- **Omnichannel Expansion:** Many D2C brands are now opening experience stores or partnering with offline channels (clicks-to-bricks)
- **Community-Led Growth:** Building engaged user communities (via social media, user-generated content, etc.)
- **Subscription Models:** Offering regular, auto-renewing delivery of consumables (e.g., grooming kits, health snacks)
- **Sustainability and Purpose-Driven Branding:** Gen Z prefers brands that align with ethical, eco-conscious values
- **AI-Driven Personalisation:** Machine learning enables hyper-personalised product recommendations and communication

3.4.3 Subscription and Loyalty Models

Subscription and loyalty models aim to **build long-term customer relationships** by offering ongoing value in exchange for recurring engagement or payments.

Subscription Model:

- Users pay a **recurring fee** (weekly/monthly/yearly) for continued access to a service or product.
- Example: Netflix, Spotify, Adobe Creative Cloud

Benefits:

- **Predictable revenue streams**
- **Customer retention**

- Opportunities to gather **usage data** over time

Loyalty Model:

- Customers earn **rewards, points, or benefits** by making repeated purchases or engaging frequently.
- Often layered with subscription programs (e.g., Amazon Prime)

Example:

- **Swiggy One** and **Zomato Gold** offer delivery discounts, priority support, and exclusive deals as part of hybrid subscription-loyalty models.

3.4.4 Marketplaces and Multi-Sided Platforms

A **multi-sided platform** serves **two or more interdependent user groups**, enabling them to interact and exchange value. The platform must balance the needs of all sides simultaneously.

Characteristics:

- **Two-sided example**: Uber (drivers and riders)
- **Three-sided example**: UrbanClap (customers, service providers, product sellers)

Challenges:

- **Chicken-and-egg problem**: You need users on both sides for the platform to succeed
- **Trust and quality control**: Especially in peer-to-peer models
- **Revenue models**: Commissions, service fees, ads, or freemium tiers

Example:

- **Ola**: Connects passengers with drivers
- **Flipkart**: Connects sellers with buyers via a marketplace model
- **Airbnb**: Connects hosts (supply) and travellers (demand)

Summary of Platform Thinking Section:

Model Type	Core Idea	Example
Platform Model	Connects users to enable interactions	Uber, Amazon, YouTube
D2C Model	Sells directly to consumers via own channels	Mamaearth, Lenskart
Subscription Model	Charges recurring fees for continued service	Netflix, Spotify
Loyalty Model	Encourages repeat use with rewards	Swiggy One, Amazon Prime
Multi-Sided Platform	Serves two or more user groups simultaneously	Airbnb, UrbanClap, Flipkart

Did You Know?

> "The **"chicken-and-egg" problem** is one of the most common barriers to launching a multi-sided platform. For example, Airbnb struggled to attract travelers initially because there weren't enough hosts, and hosts were hesitant to join without guaranteed demand. To solve this, Airbnb **seeded the platform manually** by taking professional photos of hosts' homes and providing early guarantees."

3.5 Service System Maps

A **service system map** is a tool used to visualise all the elements, actors, and flows involved in delivering a service. Unlike journey maps that focus on the user's experience, system maps look at the **entire backend ecosystem**—including people, infrastructure, technology, and policies that interact to deliver value.
This approach is critical when working with **large-scale or multi-stakeholder services**, such as healthcare, education, logistics, or public utilities.

3.5.1 Components of Service Systems

A **service system** is made up of multiple interdependent components that together create and deliver value.
Key components include:

1. Actors (People & Organisations)

- Customers, employees, suppliers, government agencies, partners
- Can be internal (staff) or external (vendors, regulators)

2. Technologies

- Digital platforms, apps, databases, communication tools

3. Infrastructure

- Physical assets such as vehicles, buildings, equipment, supply chains

4. Processes

- Step-by-step workflows that link actors and tools (e.g., delivery scheduling, data entry, issue resolution)

5. Policies and Rules

- Formal or informal rules, compliance requirements, SLAs

6. Value Exchanges

- What is exchanged: goods, services, money, data, time, or knowledge

Each service system is dynamic and evolves over time, based on usage, regulation, and innovation.

3.5.2 Visualising Flows of Information, Resources, and Value

A **service system map** shows how different components interact and where **resources**, **information**, and **value** move through the system.

Common Flows to Map:

- **Information flow**: How data is generated, shared, and accessed
- **Resource flow**: Movement of goods, money, or time
- **Value flow**: Where and how value is created, delivered, and received

Example: Public Hospital Service System

Flow Type	Description
Information	Patient records → Doctor → Lab → Pharmacy
Resource	Medicine stock → Pharmacy → Patients
Value	Health advice and treatment → Patient well-being

These flows are not always visible to the user, but they impact the **quality, efficiency, and satisfaction** of the service.

Did You Know?

"Some companies use **service system maps** to simulate how a product change will affect their entire operations—**before** implementing the change. Amazon uses flow simulation models to anticipate how a packaging update might ripple through warehousing, delivery, returns, and customer service, saving millions in rework costs."

3.5.3 Identifying Bottlenecks and Redesign Opportunities

Once the system map is created, it can be **analysed to identify issues** such as:

Bottlenecks:

- Points where delays, miscommunication, or overload happen
- Example: Manual data entry at check-in causing long queues

Redundancies:

- Repetitive tasks or unnecessary approvals
- Example: Multiple approvals for simple complaints

Gaps or Silos:

- Lack of coordination between departments

- Example: Delivery teams unaware of customer rescheduling

Opportunities:

- Areas where digital tools, automation, or process redesign can improve efficiency

Redesign Goals Might Include:

- Streamlining handoffs between teams
- Automating recurring low-value tasks
- Making invisible systems (e.g., status tracking) transparent to users
- Integrating customer feedback loops into operations

3.5.4 Case Applications of Service System Mapping

Case 1: Urban Waste Collection (Municipal Service)

- **Problem:** Irregular garbage pickups in a large city
- **System Map Insights:**
  - Resource gap: Too few trucks covering too large an area
  - Information gap: No real-time data on bin levels or route completion
- **Redesign:** IoT sensors in bins + route optimization system

Case 2: Online Learning Platform

- **Problem:** Low engagement from learners in rural areas
- **System Map Insights:**
  - Connectivity bottlenecks
  - Teachers lacked training on platform usage
  - Value delivery gaps between tech and pedagogy
- **Redesign:** Offline access + teacher onboarding program

Case 3: Inter-City Bus Booking Platform

- **Problem:** High cancellation rates and poor user trust
- **System Map Insights:**
  - Vendor bus operators frequently change schedules
  - Lack of integration between booking platform and live GPS
- **Redesign:** Platform-level service quality contracts + real-time GPS updates to users

Benefits of Service System Mapping

- Provides a **holistic view** of how a service works
- Helps teams **move beyond surface-level user complaints**
- Reveals deep systemic issues that affect performance

- Supports **cross-functional collaboration** between design, ops, and tech teams
- Enables **evidence-based redesign** at a systems level

3.6 Ideation Techniques

Ideation is the phase in the design process where teams move from understanding problems to **generating creative, feasible, and user-centred ideas**. Effective ideation techniques help unlock innovation, break away from assumptions, and explore diverse possibilities before narrowing down to specific solutions.

3.6.1 SCAMPER Framework for Idea Generation

SCAMPER is a structured method for generating ideas by **transforming existing concepts**. It uses seven thinking prompts to encourage teams to think differently.

Each letter in SCAMPER stands for a type of creative transformation:

Letter	Prompt	Description / Example
S	Substitute	Replace a part of the product or process (e.g., substitute plastic with bamboo)
C	Combine	Merge two ideas, functions, or systems (e.g., fitness + music = smart gym)
A	Adapt	Change to suit a different context (e.g., turn a food truck into a mobile classroom)
M	Modify (or Magnify)	Exaggerate or reduce elements (e.g., make something portable)
P	Put to another use	Use existing solutions in new ways (e.g., use retired buses as community clinics)
E	Eliminate	Remove unnecessary elements (e.g., remove login screens for low-risk services)
R	Reverse / Rearrange	Flip the order or perspective (e.g., customer chooses delivery time instead of vendor)

Why use SCAMPER?

It works well for improving existing systems, exploring alternatives, and unlocking non-obvious ideas.

Did You Know?

"The SCAMPER method was originally developed from brainstorming prompts used in **education** to teach young children how to be more creative. Today, it is used by global innovation teams at firms like **IKEA and LEGO** to rethink both product design and customer experience by asking questions that "hack" the status quo."

3.6.2 Brainwriting and Collaborative Ideation

While brainstorming is common, it can sometimes be dominated by louder voices or groupthink. **Brainwriting** is an alternative method that ensures **equal participation and idea diversity**.

Brainwriting Process:

1. Each participant writes down 3–5 ideas silently for a few minutes.
2. Papers are passed to the next person, who builds on those ideas.
3. Repeat for several rounds.
4. Discuss and cluster ideas as a group.

Benefits:

- Encourages **introverted thinkers** to contribute
- Prevents **premature judgment** of ideas
- Generates a **large volume of diverse inputs**

Collaborative ideation also includes methods like:

- **Crazy 8s** (8 ideas in 8 minutes)
- **Round-Robin** sharing
- **Dot Voting** for selecting ideas democratically

3.6.3 Persona Creation for User-Centric Ideas

A **persona** is a fictional character based on real user data, used to guide design decisions. Personas help teams **empathise with users**, **anchor ideas in real needs**, and **avoid designing for themselves**.

Persona Elements:

- Name, age, background
- Goals and motivations
- Pain points and frustrations
- Behaviours and habits
- Preferred tools or channels
- Quotes or life situations

Example Persona:

Name: Kavita, 28

Occupation: Urban teacher

Goal: Reduce her daily commute stress

Pain Point: Public transport is crowded and unpredictable

Use Case: Needs a reliable, low-cost transport option with real-time updates

Use in Ideation:

Teams can ask, *"Would this idea solve Kavita's problem?"* or *"How would Kavita feel using this feature?"*

Personas humanise user data and guide ideation toward **empathetic solutions**.

3.6.4 Moodboards for Visual Concept Exploration

A **moodboard** is a **visual collage of images, colours, textures, words, and design references** used to communicate the look and feel of a concept or brand. It is a creative tool often used in the **early stages of ideation**, especially in branding, product aesthetics, and UI/UX design.

Purpose:

- Express a **visual direction or theme**
- Align the team around a shared **emotional tone**
- Inspire creative concepts by association

Components of a Moodboard:

- Inspirational imagery (products, people, places)
- Colour palettes
- Fonts or typography references
- Materials and textures
- Sample interfaces or art styles
- Descriptive keywords

Tools:

- **Digital tools**: Pinterest, Canva, Miro, Milanote
- **Physical**: Magazines, fabric swatches, sketches, photographs

Example Use Case:

Designing a sustainable packaging solution for a D2C brand → Moodboard may include earthy colours, natural textures, eco-friendly symbols, and minimalistic design layouts.

Why These Techniques Matter

Together, these ideation tools help teams:

- Break creative blocks
- Focus ideas around **real user needs**
- Explore visual and functional possibilities
- Collaborate more inclusively and efficiently

3.7 AI-Assisted Ideation Tools

AI technologies are increasingly transforming how we generate, explore, and refine ideas in design. These tools assist with everything from **text-based concept generation** to **visual prototyping** and **interface design**, helping teams move faster from insights to execution.

AI doesn't replace creativity—it **enhances and accelerates** it by suggesting directions, visualising ideas, and enabling rapid iteration.

3.7.1 Using ChatGPT for Concept Development and Scenario Testing

ChatGPT (or similar large language models) can be used as a **creative co-pilot** during the ideation phase.

Key Uses:

1. **Idea Generation**
    - Generate multiple concepts for a given user problem or need
    - Explore alternatives with varied constraints (e.g., budget-friendly, inclusive, tech-based)
2. **Scenario Testing**
    - Simulate "what if" use cases to test how a solution might work in real contexts
    - Example: "What happens if a delivery is delayed by 3 hours due to rain?"
3. **Persona-Driven Responses**
    - Roleplay responses from different personas (e.g., "How would a senior citizen react to this design?")
4. **Rapid Research Summarisation**
    - Summarise articles, feedback, or trend reports to inform ideation

Example Prompt:

"Suggest five low-cost transportation ideas for urban commuters, focused on safety and inclusivity."

"Activity 1: Use AI to Co-Generate Ideas for a Social Impact Problem"

Instruction to Student:

Pick a real-world social or environmental problem (e.g., water conservation, digital education

access). Use ChatGPT or any other AI language model to **generate 5 solution ideas**, using specific prompts.

Example prompt:

"Suggest five low-cost ideas for improving digital access to education in rural areas."

Then:

- Select one idea you think has the most potential.
- Use the AI to help you **develop a quick scenario or use case** for how the solution would work in real life.
- Submit both the AI prompt and the AI's response, along with your reflection on the idea's feasibility.

3.7.2 Visual Ideation with MidJourney

MidJourney is an AI-based image generation tool that turns textual prompts into highly stylised images. It is used widely in early-stage concept visualisation and branding.

Applications in Ideation:

- Visualising **moods, environments, or scenarios** (e.g., "a futuristic food truck")
- Exploring **product form and style** without needing design skills
- Creating **brand atmospheres or style references**

Advantages:

- Stimulates visual thinking
- Helps teams **communicate abstract ideas**
- Useful for moodboards and early presentations

Example Prompt:

"Design concept of a solar-powered street kiosk in a crowded market area, rendered in realistic style"

3.7.3 Collaborative Prototyping with Figma AI

Figma is a collaborative interface design tool. Its AI features help accelerate **prototyping and layout generation**, especially in UI/UX contexts.

Figma AI Features:

- **Auto-layout suggestions**
- **AI-generated interface components** (buttons, cards, inputs, etc.)
- **Smart content filling** (placeholder text and images)
- **Quick styling and theme suggestions**

How it Supports Ideation:

- Turn **low-fidelity sketches into clickable prototypes**
- Experiment with different UI layouts instantly
- Speed up design workflows for websites, apps, and digital services

Example Use Case:

A designer sketches a login screen idea, and Figma AI helps translate it into a structured prototype with real buttons and fields—ready for testing.

3.7.4 Converting Raw Ideas into Concept Sketches

Not all team members are trained in visualisation, but AI tools can help convert **textual or rough verbal ideas into sketches** or wireframes.

Tools for This:

- **Dall·E** (OpenAI): Text-to-image generation
- **Uizard**: Turns hand-drawn wireframes into digital UI designs
- **AutoDraw**: Turns scribbles into clean icon-style drawings

Why This Matters:

- Helps **non-designers contribute visually**
- Useful for **pitch decks, workshops, or moodboards**
- Encourages **faster iteration and exploration** of ideas

Example:

A team member describes an idea for a compact foldable desk. Using a tool like Dall·E or MidJourney, a visual concept sketch is generated within seconds for discussion and refinement.

Key Insight:

AI tools in ideation act as **accelerators and collaborators**. They expand the space of possibilities, reduce creative friction, and allow for **rapid exploration** of both textual and visual ideas—especially in time-constrained or resource-limited environments.

Knowledge Check 1

Choose the correct option:

1. In stakeholder mapping, a group that is **indirectly affected by a service but not directly involved** is called:

A. Primary stakeholder

B. Key stakeholder

C. Secondary stakeholder

D. Internal stakeholder

2. Which of the following is a **frontstage interaction** in a food delivery service?

   A. Delivery routing algorithm

   B. Order confirmation SMS

   C. Inventory update at restaurant

   D. Restaurant kitchen workflow

3. What is a major benefit of platform-based business models?

   A. Higher manufacturing control

   B. Ownership of all content and supply

   C. Enabling value exchange between multiple parties

   D. Operating without the internet

4. Which AI tool is best suited for **generating visual concepts from text prompts**?

   A. Figma

   B. Uizard

   C. MidJourney

   D. Trello

5. In the SCAMPER method, the "E" stands for:

   A. Expand

   B. Enhance

   C. Eliminate

   D. Evaluate

3.8 Summary

❖ Module 3 explored the shift from isolated design decisions to **systemic thinking in service design**. It covered how services can be mapped, visualised, and reimagined through the lens of **ecosystems**, **stakeholders**, **technological platforms**, and **AI-powered ideation tools**.

❖ The focus was on equipping learners with methods to understand not just *what* to design, but *how* to design for interconnected, dynamic systems with multiple user groups.

- Key topics included:
- Mapping stakeholders and aligning their expectations

- Visualising customer journeys through touchpoints
- Understanding the balance between frontstage and backstage
- Designing for platforms, ecosystems, and multi-sided networks
- Using tools like service system maps, moodboards, personas, and AI apps (e.g., ChatGPT, MidJourney, Figma AI) for ideation

3.9 Key Terms

1. **Stakeholder Mapping** – Identifying individuals or groups involved in or affected by a service system.
2. **Touchpoints** – All instances where a customer interacts with a service or brand.
3. **Frontstage vs Backstage** – Visible service interactions (frontstage) versus the operational support systems (backstage).
4. **Platform Thinking** – A design approach focused on enabling multi-party value exchange rather than just delivering services.
5. **Service System Map** – A visual tool to represent the actors, flows, and resources in a service ecosystem.
6. **SCAMPER** – A structured ideation technique using seven prompts for creative thinking.
7. **Persona** – A fictional, data-driven user profile representing target customer segments.
8. **Moodboard** – A collage of images and keywords used to represent a concept's emotional tone.
9. **Figma AI** – AI-powered collaborative design tool for prototyping digital interfaces.
10. **MidJourney** – AI tool that converts text prompts into visual design concepts.

3.10 Descriptive Questions

1. What is stakeholder mapping, and how does it help in aligning service goals across an ecosystem?
2. Explain the difference between frontstage and backstage in service design with one example.
3. How can service system maps be used to identify operational bottlenecks?
4. Describe the SCAMPER technique and explain how it supports ideation.
5. What are the advantages of using AI tools like ChatGPT or MidJourney in early-stage concept development?

3.11 References

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Answers to Knowledge Check

Knowledge check 1

1. C. Secondary stakeholder
2. B. Order confirmation SMS
3. C. Enabling value exchange between multiple parties
4. C. MidJourney
5. C. Eliminate

3.12 Case Study

Netflix – Mapping the Service Ecosystem and Using AI Tools for Conceptual Innovation

Background:

Netflix began as a DVD rental company and has evolved into one of the world's leading content platforms. Its transformation is rooted not just in tech adoption, but in systemic service design that includes **platform thinking**, **touchpoint management**, and **data-driven ideation**.

Stakeholder Mapping:

Netflix serves multiple stakeholder groups:

- Users (viewers, subscribers)
- Content creators (studios, directors)
- Tech teams (recommendation engine, streaming infrastructure)
- Regulators and partners (licensing bodies, ISPs)
- Internal teams (marketing, customer support)

Touchpoint Mapping:

Netflix manages multiple digital touchpoints:

- Mobile app, TV app, web interface
- Recommendation banners, notifications
- Subscription billing and help centres

Each touchpoint is optimised based on data and user interaction patterns.

Platform Thinking:

Netflix operates as a **two-sided platform**:

- Demand side: Viewers consume content
- Supply side: Creators upload/licence content
- The algorithm acts as the matching engine

AI-Assisted Innovation:

- **ChatGPT-like models** simulate viewer reactions to show concepts
- **MidJourney-type tools** are used in internal marketing for key visuals

- **AI-based trailers** and content thumbnails are A/B tested in real time
- **Figma AI** helps prototype new UI updates and feature trials

Outcomes:

- Hyper-personalised experiences
- Rapid concept testing before investment
- Strong integration of AI and human creativity

Unit 4: Prototyping, Blueprinting & Testing

Learning Objectives

1. Understand the fundamental principles and purpose of **prototyping** in service design.
2. Learn how to create and analyze a **service blueprint** to map customer interactions and backend processes.
3. Explore effective methods for **packaging and presenting** service concepts to stakeholders.
4. Apply **usability testing techniques** to evaluate service functionality and user experience.
5. Master the use of **feedback and refinement cycles** for continuous service improvement.
6. Summarize key insights and best practices from the **prototyping and testing** stages of service design.
7. Identify and explain key terms, answer descriptive questions, and analyze a **real-world case study**.

Content

4.0 Introductory Caselet

"The Village Bridge: A Dialogue between Riya and a Craftsman"

Background:

Riya, a young engineering student from Delhi, visits her ancestral village during summer break. She notices that villagers still cross a river using stepping stones, which often become slippery and dangerous during monsoons. Concerned about safety, she wonders why no permanent bridge has been built yet.

One evening, she meets an elderly craftsman sitting near the river, carving wood. Riya shares her thoughts about designing a modern steel bridge. The craftsman smiles and says, "Every solution begins as an idea, but ideas must first be tested in small, safe ways. Long ago, we built temporary wooden walkways here to test strength and balance. Only after learning from failures did we decide what could last."

Over the next few days, the craftsman shows Riya how villagers experiment with bamboo structures, ropes, and stone supports before making anything permanent. Riya realizes that testing small-scale versions helps avoid costly mistakes and ensures usefulness.

When she returns to her engineering college, she carries not just the memory of her village, but also a deeper understanding: innovation grows stronger when ideas are tested step by step.

Critical Thinking Question:

Why is it important to test small-scale or trial versions of ideas before building full-scale solutions, especially in engineering or social projects?

4.1 Prototyping Basics

Prototyping is the process of creating a small, simplified version of a product or idea before making the final one. It is like making a draft or model to see if the concept will work in real life. Instead of investing huge amounts of time and money in a full-scale project, designers and engineers use prototypes to test, improve, and refine ideas.

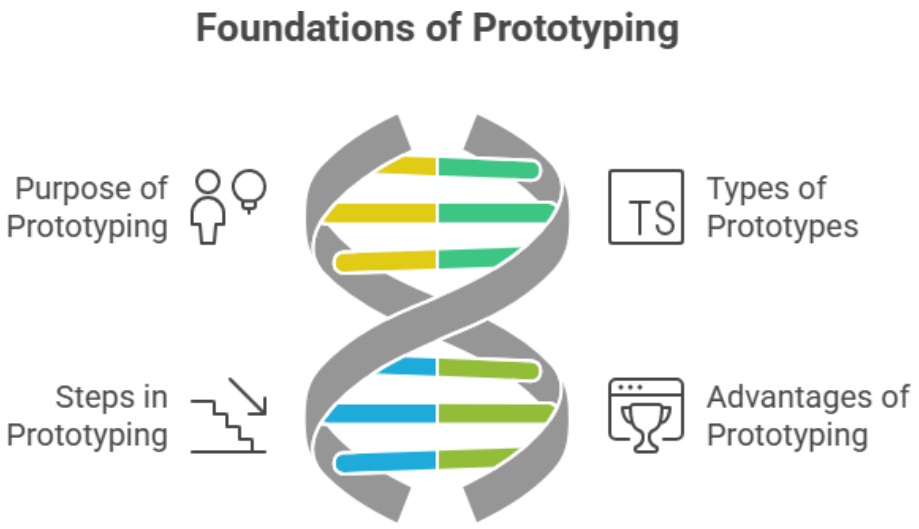

Figure 4.1

Here are the basics explained in simple terms:

1. **Purpose of Prototyping**
    - To test whether an idea is practical.
    - To identify problems early.
    - To get feedback from users before finalizing the design.
2. **Types of Prototypes**
    - **Low-fidelity prototypes:** Very simple and quick models, such as sketches, paper models, or basic mock-ups. They show the general idea without many details.
    - **High-fidelity prototypes:** More detailed and closer to the final product, such as digital app simulations, 3D models, or functional mechanical samples.
3. **Steps in Prototyping**
    - **Idea generation:** Start with a concept.
    - **Model creation:** Build a simple version using available tools or materials.
    - **Testing:** Try it out to see if it works as intended.
    - **Feedback and improvement:** Gather suggestions and make changes.

4. **Advantages of Prototyping**
    - Saves time and cost by avoiding mistakes in the final product.
    - Encourages creativity and experimentation.
    - Helps explain ideas clearly to others, such as teammates or clients.
    - Builds confidence in the design before large-scale production.
5. **Everyday Example**

    Imagine you want to design a new mobile app. Instead of coding the entire app directly, you first draw the app screens on paper, then create a clickable digital demo. By showing this to users, you find out what they like and what needs fixing. Only after this feedback do you begin actual programming.

4.1.1 Concept of MVPs (Minimum Viable Products)

An MVP, or Minimum Viable Product, is the **simplest working version of a product** that can be tested with real users. It includes only the most important features, not the full set of functions planned for the final version.

- **Purpose:**

  The goal of an MVP is to quickly launch something basic, so that feedback from users can guide improvements. Instead of spending years building a complete product that may fail, creators release a smaller version to test the market.
- **Key Features of an MVP:**
    1. Focuses on solving the main problem.
    2. Has only essential features, nothing extra.
    3. Allows real users to test and give feedback.
    4. Can be changed or improved based on results.
- **Example:**

  Suppose a team wants to build a food delivery app. Instead of making a fully advanced platform with tracking, discounts, and ratings, they first launch a simple version where customers can place basic orders from a limited number of restaurants. This MVP helps them learn whether people want such a service in that area.

Did You Know?

"Dropbox, the famous file storage company, did not launch a full product at first. Instead, they released a **short demo video** as their MVP to show how the service would work. Thousands of users signed up after watching the video, proving demand before Dropbox even built the actual system."

4.1.2 Low-Fidelity vs High-Fidelity Prototypes

Prototypes can be divided into two main types based on detail and accuracy:

- **Low-Fidelity Prototypes:**
  - Very rough and simple.
  - Often made with paper, sketches, or basic digital outlines.
  - Focus on the idea and structure, not appearance or final look.
  - Easy and quick to create.
  - Example: Drawing app screens on paper to show how users might move from one page to another.
- **High-Fidelity Prototypes:**
  - More polished and detailed.
  - Look closer to the real product, sometimes even partly functional.
  - Focus on design, usability, and interaction.
  - Take more time and effort to build.
  - Example: An interactive app demo on a computer where users can click buttons and test features as if using the actual app.

The choice between low- and high-fidelity prototypes depends on the stage of development. Early stages use low-fidelity, while later stages use high-fidelity for realistic testing.

4.1.3 Wireframes, Mockups, and Simulations

These are common tools used in the prototyping process:

1. **Wireframes:**
   - Simple outlines or "blueprints" of a design.
   - Show the layout of elements like buttons, menus, and images.
   - Usually black and white, without colors or decoration.
   - Purpose: To plan structure and navigation.
2. **Mockups:**
   - More detailed, colorful, and visually refined designs.
   - Show exactly how the product might look in real life.

- Do not always have functionality (non-clickable images).
- Purpose: To present the final design style and feel.

3. **Simulations (or Interactive Prototypes):**
   - Models that behave like the real product.
   - Users can click, scroll, or interact as if using the actual system.
   - Often created with digital tools for apps, websites, or machines.
   - Purpose: To test user experience and functionality before real coding or production.

Example: For a new e-learning platform:

- Wireframe: A sketch showing where the login box, video area, and course list will appear.
- Mockup: A colored design showing fonts, themes, and icons.
- Simulation: A clickable demo where a user can "log in" and view a sample course.

4.1.4 Role of Rapid Prototyping in Innovation

Rapid prototyping is the process of **quickly creating models or trial versions** of a product using modern tools like 3D printing, software platforms, or quick design methods.

- **Why it matters for innovation:**
  1. **Speed:** Ideas can be tested and improved much faster than traditional methods.
  2. **Cost-saving:** Problems are discovered early, before spending heavily on production.
  3. **Creativity:** Teams can try multiple versions of an idea quickly and compare results.
  4. **User feedback:** Real users can test versions early, helping shape the final product.
- **Examples in real life:**
  - In product design, companies use 3D printers to create quick models of new gadgets.
  - In software, developers use clickable prototypes to test app ideas with users.
  - In healthcare, medical equipment is tested first with small, rapidly built models before creating expensive machines.

Rapid prototyping plays a central role in innovation because it allows experimentation without fear of failure, leading to better and more user-friendly final products.

4.2 Service Blueprinting

Service blueprinting is a **visual tool used to design and analyze services**. It shows how a service works step by step, mapping both what the customer experiences and what happens behind the scenes.

It helps organizations understand the whole service process, identify problems, and improve customer satisfaction.

4.2.1 Elements of a Service Blueprint

A service blueprint usually contains several key components:

1. **Customer Actions** – The steps the customer takes while using the service (e.g., booking a ticket online, calling support).
2. **Frontstage (Visible Contact Employee Actions)** – Interactions between the customer and employees that the customer can see (e.g., a waiter taking an order, a cashier processing payment).
3. **Backstage (Invisible Contact Employee Actions)** – Activities employees perform that the customer cannot see but that support the service (e.g., a chef preparing food in the kitchen).
4. **Support Processes** – Internal systems and tasks that enable the service (e.g., payment processing systems, IT support, supplier coordination).
5. **Physical Evidence** – Any tangible element the customer comes in contact with (e.g., receipts, websites, menus, brochures, service centers).
6. **Lines of Interaction and Visibility** – Horizontal lines that separate customer activities, frontstage activities, and backstage activities, showing who interacts with whom and what is hidden.

Did You Know?

"The concept of **service blueprinting** was first introduced in the **1980s by Lynn Shostack**, a bank executive, to solve problems in financial services. Today, it is used in industries as diverse as healthcare, airlines, retail, and even online streaming platforms."

4.2.2 Mapping Frontstage vs Backstage Activities

In any service, activities can be divided into two parts:

- **Frontstage Activities:**
  - Directly visible to customers.
  - Shape the customer's perception of the service.
  - Example: A hotel receptionist greeting a guest, a delivery person handing over a package.
- **Backstage Activities:**
  - Hidden from customers but essential for smooth delivery.
  - Often include preparation, coordination, and technical processes.
  - Example: The hotel staff cleaning rooms, logistics teams managing delivery routes.

Why the distinction matters:

- Frontstage activities influence customer satisfaction directly.
- Backstage activities ensure efficiency and reliability, even if customers never see them.

A blueprint helps connect both parts, showing how backstage supports frontstage to deliver a complete experience.

4.2.3 Identifying Bottlenecks and Service Gaps

A **bottleneck** is a point where the service slows down or becomes inefficient, while a **service gap** is a mismatch between what the customer expects and what is delivered.

- **Common Bottlenecks:**
  - Long waiting times (e.g., call centers with long hold times).
  - Overloaded staff or limited resources.
  - Complex approval processes delaying service.
- **Common Service Gaps:**
  - Promises not matching reality (e.g., an app advertises instant booking, but confirmation takes hours).
  - Poor communication between teams (e.g., front desk staff not informed about backend changes).
  - Missing steps in the customer journey (e.g., no clear instructions after an online purchase).

Blueprinting helps locate these issues visually, making them easier to solve.

4.2.4 Using Service Blueprints to Improve User Journeys

The ultimate goal of service blueprinting is to **improve the customer's journey**—the entire experience from start to finish.

- **How blueprints help:**
  1. **Clarity:** They give a clear picture of what happens at every stage of service.
  2. **Consistency:** Ensure that customer experiences are reliable across different touchpoints.
  3. **Problem-Solving:** Highlight weak areas where customer frustration may occur.
  4. **Innovation:** Inspire new ideas by showing opportunities for improvement.
- **Example:**

  For an online food delivery service:
  - Customer Journey: Browsing menu → Ordering → Payment → Tracking → Delivery.
  - Blueprint reveals that while the app is smooth, delays happen backstage when restaurants confirm orders slowly.

- By improving backstage coordination, the overall user journey becomes faster and more satisfying.

4.3 Packaging and Presentation

Packaging and presentation mean **how ideas and prototypes are shown to others**—whether to teammates, investors, clients, or users. Even the best idea needs to be communicated effectively so people can understand, trust, and support it. This stage focuses on using visuals, prototypes, and presentations to explain concepts and persuade audiences.

4.3.1 Communicating Concepts through Storyboards and Visuals

- **Storyboards:**

  A storyboard is like a comic strip that shows the steps of how a product or service will be used. It tells a story visually, often with sketches, simple drawings, or digital images.
  - Purpose: To make complex ideas easy to understand.
  - Example: For a mobile payment app, a storyboard might show a customer forgetting cash, scanning a QR code, and quickly paying through the app.
- **Visuals:**

  Pictures, diagrams, infographics, and simple charts help explain ideas faster than long text.
  - Purpose: To capture attention and improve clarity.
  - Example: A flowchart showing how an online order moves from "Add to Cart" → "Payment" → "Delivery" can explain the process better than words alone.

Both storyboards and visuals make ideas more engaging, memorable, and easier to discuss.\

"Activity: Storyboarding Solutions for Student Problems"

Instruction to Students:

1. Select a common problem in student life (e.g., managing study schedules, food delivery delays, or navigating campus).
2. Create a **six-frame storyboard** that visually explains how your solution would work step by step.
3. Use only simple sketches, stick figures, or icons—do not focus on artistic skills.
4. Ensure the storyboard clearly shows the **problem → action → solution** sequence.

5. Submit your storyboard and a **100-word explanation** describing how visuals make the idea more understandable.

4.3.2 Preparing Prototypes for Stakeholder Feedback

Stakeholders are people who have an interest in the project—such as investors, clients, managers, or end-users. Before finalizing a product, it's important to share prototypes with them.

- **Steps to Prepare Prototypes for Feedback:**
    1. **Choose the right level of detail:** Sometimes a rough model is enough, while other times a polished version is required.
    2. **Highlight key features:** Show the parts that matter most for decision-making.
    3. **Make it interactive if possible:** Allow stakeholders to test the product, app, or service themselves.
    4. **Prepare questions:** Ask for feedback on usability, design, and value.
- **Why it matters:**
    - Saves time and money by correcting mistakes early.
    - Involves stakeholders in decision-making, creating trust and ownership.
    - Helps discover hidden expectations or requirements.

4.3.3 Designing Presentations that Inspire and Persuade

A presentation is not just about sharing data; it is about **inspiring confidence and creating belief** in the idea.

- **Key Features of an Effective Presentation:**
    1. **Clarity:** Use simple language and visuals instead of complex jargon.
    2. **Storytelling:** Present the idea as a story—what problem exists, how your solution works, and why it matters.
    3. **Emotions + Logic:** Use both facts (data, research) and emotions (stories, examples) to connect with the audience.
    4. **Structure:** Begin with the problem, then show the solution, explain benefits, and end with a strong call to action.

Figure 4.2

- **Example:**

  When presenting a new eco-friendly packaging design, instead of showing only technical details, the presentation could start with the story of how plastic waste harms marine life, followed by how the new design solves the issue.

4.3.4 Pitching Ideas with Clear Value Propositions

A **value proposition** is a clear statement that explains why someone should support, buy, or invest in your idea. It highlights the unique benefit your solution provides.

- **Components of a Strong Value Proposition:**
  1. **Problem Statement:** What issue are you solving?
  2. **Solution Offered:** How does your product/service solve it?
  3. **Unique Advantage:** What makes it different or better than alternatives?
  4. **Benefit to Stakeholders:** Why is it worth their time, money, or effort?
- **Example of a Value Proposition:**

  For a solar-powered lantern:
  - Problem: Rural areas without reliable electricity face darkness at night.
  - Solution: A low-cost solar lantern that charges during the day.
  - Unique Advantage: Cheaper and longer-lasting than batteries or kerosene lamps.
  - Benefit: Improves safety, education, and quality of life.

When pitching, it's important to be short, clear, and focused, so that stakeholders immediately understand why the idea is valuable.

4.4 Usability Testing

Usability testing is the process of **checking how real people use a product or service** to see if it is easy, efficient, and satisfying. Instead of relying only on designer assumptions, usability testing puts the prototype in the hands of users to uncover problems and opportunities for improvement.

It helps answer questions like:

- Can users complete tasks easily?
- Do they make errors or get stuck?
- Are they satisfied with the overall experience?

4.4.1 Methods of Usability Testing (In-person, Remote, A/B Testing)

There are different ways to carry out usability testing depending on time, resources, and goals:

1. **In-person Testing**
    - Users are observed directly in a controlled setting, like a lab or meeting room.
    - Researchers can ask questions, notice facial expressions, and track behavior.
    - Example: Watching someone try to complete a banking app transaction on a tablet.
2. **Remote Testing**
    - Users test the product from their own location using screen-sharing or specialized tools.
    - Useful for reaching diverse groups across different regions.
    - Example: Asking participants in different cities to test an e-commerce website and record their experiences.
3. **A/B Testing**
    - Two versions (A and B) of the product are shown to different groups of users.
    - Performance is compared to see which version works better.
    - Example: Testing two different layouts of a checkout page to see which one leads to fewer abandoned carts.

Did You Know?

"NASA uses **remote usability testing** for its astronaut training software. Since astronauts train

across multiple locations, NASA relies on remote tools to test software usability before it is used in critical space missions."

4.4.2 Defining Metrics: Task Success, Errors, Satisfaction

Usability testing relies on **measurable indicators (metrics)** to judge performance:

1. **Task Success Rate**
    - Measures how many users can complete a given task successfully.
    - Example: Out of 10 users, if 8 successfully book a ticket, the success rate is 80%.
2. **Error Rate**
    - Counts mistakes users make while using the product.
    - Example: Entering wrong login details, clicking the wrong button, or repeating steps unnecessarily.
3. **Satisfaction Level**
    - Captures how users feel about the experience.
    - Usually measured through surveys, ratings, or open-ended feedback.
    - Example: After testing, users rate their satisfaction on a scale of 1–5.

Together, these metrics show both the effectiveness and the emotional impact of a design.

4.4.3 Collecting and Analyzing User Feedback

Feedback is the most valuable output of usability testing. It can be both **quantitative (numbers, ratings)** and **qualitative (opinions, stories)**.

- **Methods of Collecting Feedback:**
    - Surveys and questionnaires.
    - Interviews after testing.
    - Observing user behavior during tasks.
    - Recording screen activity or eye movements.
- **Analyzing Feedback:**

1. Look for common problems faced by multiple users.
2. Separate critical issues (stopping progress) from minor ones (slight inconvenience).
3. Identify patterns—such as repeated confusion about navigation or unclear instructions.
4. Translate insights into design improvements.

Example: If many users abandon the checkout process because they can't find the "Apply Coupon" option, designers know this is a major usability issue to fix.

4.4.4 Ethics and Best Practices in User Testing

Since usability testing involves people, ethical principles must be followed:

- **Ethical Considerations:**
    1. **Informed Consent:** Users should know what the test is about and agree to participate.
    2. **Privacy Protection:** Personal data should not be misused or shared without permission.
    3. **Respect and Comfort:** Users should not feel judged for making mistakes; the test is about the design, not the person.
- **Best Practices:**
    1. Test with real users who represent the target audience.
    2. Keep instructions clear and neutral (avoid guiding users toward the "right" answer).
    3. Start small, test early, and repeat frequently.
    4. Document findings carefully and use them to improve the design.

Example: When testing a healthcare app, researchers must ensure patients' medical details remain confidential and the environment feels safe for honest feedback.

4.5 Feedback and Refinement Cycles

Feedback and refinement cycles are the repeated processes of **testing, receiving input, making changes, and improving a product or service**. Instead of treating design as a one-time event, teams refine solutions continuously based on what users and stakeholders say. This ensures that the final outcome is both useful and sustainable.

4.5.1 Iterative Design and Continuous Improvement

- **Iterative Design** means improving a product step by step, in repeated cycles.
- After each cycle of prototyping and testing, feedback is collected and used to adjust the design.
- This cycle repeats until the product is efficient, user-friendly, and effective.

Benefits:

1. Detects problems early before large investments are made.
2. Allows experimentation with multiple ideas.
3. Ensures that the final solution evolves with real user needs.

Example: A team designing an online learning app might release an early version to a small group, gather feedback, refine navigation, and release again. Each round makes the app better.

4.5.2 Prioritizing Feedback for Implementation

Not all feedback can or should be acted on at once. Teams must decide which suggestions are most important.

Ways to Prioritize:

1. **Critical Issues First:** Fix problems that block users from completing essential tasks.
2. **Frequency of Feedback:** Address issues mentioned by many users before one-off requests.
3. **Impact vs. Effort Analysis:** Compare how much benefit a change brings against how much time or money it costs.

Example: If 80% of users complain about confusing checkout steps but only 5% suggest adding new colors to the app, fixing the checkout flow is the priority.

4.5.3 Balancing User Needs with Business Constraints

Designers must balance two perspectives:

- **User Needs:** Making sure the product is easy, valuable, and enjoyable.
- **Business Constraints:** Limited budgets, deadlines, technology restrictions, and company goals.

Balancing Strategies:

1. Deliver a functional solution that solves the main problem first.
2. Negotiate trade-offs—sometimes a perfect design is not possible immediately.
3. Plan features in phases: urgent needs first, "nice-to-have" features later.

Example: A food delivery startup may want advanced AI recommendations, but if funding is tight, it focuses first on reliable order placement and delivery tracking.

4.5.4 Case Applications of Feedback-Driven Refinement

Feedback-driven refinement can be seen in many industries:

1. **Software Development:**
    - Apps release "beta versions" to users.
    - Feedback helps improve usability and fix bugs before the full launch.
2. **Healthcare Products:**
    - Medical devices are tested with patients and doctors.
    - Adjustments are made for comfort, safety, and accuracy.
3. **Education Tools:**
    - New e-learning platforms test modules with teachers and students.
    - Feedback highlights confusing content or technical glitches.
4. **Retail Services:**

- Stores experiment with different layouts.
- Customer behavior and feedback decide which arrangement works best.

These real-world applications show that refinement is not an afterthought—it is central to creating successful products and services.

Knowledge Check 1

Choose the correct option:

1. Which of the following best describes a low-fidelity prototype?
   A) A polished, interactive app demo with clickable features
   B) A rough sketch or simple mock-up to test ideas quickly
   C) A fully functional product ready for market launch
   D) A 3D printed model with complete design details
2. In a restaurant service blueprint, which of the following is a backstage activity?
   A) A waiter taking orders from customers
   B) A cashier printing the bill for customers
   C) A chef cooking food in the kitchen
   D) A customer placing an order
3. Which of the following is the most effective way to inspire confidence in a presentation?
   A) Presenting only data and ignoring emotions
   B) Using a mix of storytelling and data to connect with the audience
   C) Including all technical details in lengthy paragraphs
   D) Avoiding visuals and focusing only on spoken words
4. If 9 out of 10 users successfully complete a task during usability testing, what is the task success rate?
   A) 60%
   B) 70%
   C) 80%
   D) 90%
5. Which of the following best illustrates balancing user needs with business constraints?
   A) Adding every feature users request, regardless of cost
   B) Ignoring user needs and focusing only on profit

C) Releasing essential features first, while planning advanced features for later phases

D) Refusing to make changes once the prototype is built

4.6 Summary

- This chapter explored the complete cycle of **designing, testing, and refining innovations**. It began with the **basics of prototyping**, showing how ideas can be developed into small-scale models for testing. Then it introduced **service blueprinting**, a tool to map both frontstage and backstage activities.
- Next, we examined **packaging and presentation**, focusing on how to communicate ideas through storyboards, visuals, and persuasive presentations. The chapter then moved into **usability testing**, emphasizing real-user evaluation, feedback collection, and ethical practices. Finally, the concept of **feedback and refinement cycles** was discussed, showing how iterative design leads to continuous improvement.
- Together, these sections present a step-by-step approach to developing solutions that are practical, user-centered, and adaptable.

4.7 Key Terms

1. **Prototype:** A trial model of a product or service used to test ideas before full development.
2. **Minimum Viable Product (MVP):** The simplest working version of a product with core features.
3. **Low-Fidelity Prototype:** A rough, early version, often made with sketches or paper models.
4. **High-Fidelity Prototype:** A detailed and realistic version closer to the final product.
5. **Wireframe:** A basic outline showing the layout of a product interface.
6. **Mockup:** A polished visual design of a product without functionality.
7. **Simulation:** An interactive prototype that mimics real product behavior.
8. **Service Blueprint:** A visual map of customer actions, frontstage, backstage, and support processes.
9. **Frontstage Activities:** Visible interactions between service providers and customers.
10. **Backstage Activities:** Hidden processes supporting the service delivery.
11. **Usability Testing:** A method to test how easy and effective a product is for real users.
12. **Task Success Rate:** A measure of how many users complete a task successfully.
13. **Feedback Cycle:** The repeated process of collecting feedback and refining design.
14. **Value Proposition:** A clear statement showing the unique benefit of a product/service.
15. **Iterative Design:** Improving a product step by step through repeated testing.

4.8 Descriptive Questions

1. Explain the concept of Minimum Viable Product (MVP) with an example.
2. Differentiate between low-fidelity and high-fidelity prototypes.
3. What are the key elements of a service blueprint? Illustrate with an example.
4. Discuss the role of visuals and storyboards in communicating design ideas.
5. Describe different methods of usability testing and their applications.
6. What metrics are commonly used in usability testing? Explain their importance.
7. How can feedback cycles improve innovation in product design?
8. What challenges arise in balancing user needs with business constraints?
9. Discuss the ethical considerations in conducting usability testing.
10. Analyze how prototyping, service blueprinting, and usability testing work together to refine a product.

4.9 References

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Answers to Knowledge Check

Knowledge check 1

1. B) A rough sketch or simple mock-up to test ideas quickly
2. C) A chef cooking food in the kitchen
3. B) Using a mix of storytelling and data to connect with the audience
4. D) 90%
5. C) Releasing essential features first, while planning advanced features for later phases

4.10 Case Study:

Swiggy Genie Prototype – Iterative Prototyping, Service Blueprinting, and Usability

Introduction

Swiggy Genie is a delivery service launched by Swiggy that enables users to send or receive packages, groceries, or essential items quickly within cities. While the idea seemed simple, its execution required detailed testing and refinement. To ensure reliability and customer satisfaction, Swiggy used a combination of **iterative prototyping, service blueprinting, and usability testing**.

This caselet explores the challenges Swiggy faced in designing Genie, the methods they used to improve the service, and the role of feedback in shaping the final product.

Background

When Swiggy decided to expand beyond food delivery, they created an **MVP (Minimum Viable Product)** for Genie. The early version allowed only basic pick-up and drop-off services. Through prototypes and user testing, the team refined booking flows, added live tracking, and identified service gaps.

A **service blueprint** was created to map customer actions (booking deliveries), frontstage interactions (delivery partner pick-up and drop-off), backstage activities (driver allocation, order routing), and support processes (maps, payment systems).

Usability testing revealed issues such as address entry confusion, slow partner allocation, and limited communication between customers and delivery partners. These findings shaped later refinements, leading to a smoother and more reliable service.

Problem Statement 1: Confusing Address Input for Users

Many users reported difficulties while entering detailed addresses, especially in areas without clear landmarks. This caused frustration and delivery delays.

Solution:

Swiggy introduced an **auto-suggest and "frequently used addresses" feature**. This reduced errors, made input faster, and improved delivery accuracy.

MCQ:

What was the most effective solution for reducing address input errors in Swiggy Genie?

A) Allow customers to type free-form addresses only

B) Use GPS auto-suggestions and save frequent addresses

C) Rely on delivery partners to call customers for directions

D) Remove the detailed address field altogether

Answer: B) Use GPS auto-suggestions and save frequent addresses

Explanation: Auto-suggestions and saved addresses reduce input errors and speed up booking, improving both customer and partner experience.

Problem Statement 2: Delays in Partner Allocation

Customers often faced waiting times because delivery partners were not assigned quickly. This gap in backstage operations affected user satisfaction.

Solution:

Swiggy improved **routing algorithms** and created a **priority-matching system** that assigned partners faster by considering distance, availability, and delivery load.

MCQ:

How did Swiggy address partner allocation delays?

A) Assigned partners randomly

B) Improved routing and created a priority-matching system

C) Reduced the number of delivery requests allowed per user

D) Made customers wait until a partner was free

Answer: B) Improved routing and created a priority-matching system

Explanation: A smarter algorithm matched partners faster, reducing delays and improving efficiency.

Problem Statement 3: Limited Tracking Transparency

In early prototypes, users complained about **unclear tracking updates**, leading to confusion and repeated customer support calls.

Solution:

Swiggy tested two versions (A/B testing) of the tracking screen. The version with **real-time progress updates and estimated delivery times** was chosen, as it improved user confidence and satisfaction.

MCQ:

Which feature improved tracking transparency for users?

A) Removing tracking to avoid confusion

B) Showing only pick-up confirmation

C) Real-time updates with delivery estimates

D) Sending SMS updates only

Answer: C) Real-time updates with delivery estimates

Explanation: Real-time progress with estimated times kept users informed and reduced uncertainty.

Conclusion

Swiggy Genie's journey from MVP to full service demonstrates the power of **feedback-driven refinement**. Through **iterative prototyping**, the team tested features quickly. **Service blueprinting** revealed gaps between frontstage and backstage processes. **Usability testing** exposed user frustrations and guided improvements.

By combining these methods, Swiggy reduced risks, improved customer satisfaction, and launched a service that is now an important part of urban logistics. The case highlights how structured design processes ensure both efficiency and reliability.

Unit 5: Storytelling, Pitching & Impact Design

Learning Objectives

1. Understand the principles of **business storytelling** and its role in effective communication.
2. Explore the use of **emotional design in narratives** to connect with audiences.
3. Learn techniques for **pitching ideas with clarity and impact**.
4. Analyze strategies for **designing solutions with long-term impact** in mind.
5. Apply storytelling methods to **influence decision-making and inspire action**.
6. Evaluate how narratives can balance **logic, data, and emotion** in business contexts.
7. Integrate storytelling, pitching, and design thinking into a **comprehensive case study** for practical learning.

Content

5.0 Introductory Caselet

"The Pitch at Midnight: A Conversation between Neha and Her Mentor"

Background:

Neha, a young entrepreneur, has been invited to pitch her startup idea at a late-night innovation challenge. She has all the facts, market data, and financial charts ready, but she feels her presentation is missing something powerful.

She calls her mentor, who listens carefully and says:

"Numbers convince the mind, but stories move the heart. If you want people to believe in your idea, don't just tell them what it does—tell them why it matters. People invest in stories of impact, not just in spreadsheets."

That night, Neha reframes her pitch. Instead of starting with financials, she begins with the story of a delivery worker struggling to manage time, and how her solution can change that. The panel not only understands the problem better but also connects emotionally with her idea.

Critical Thinking Question:

Why do stories often create stronger connections with audiences than facts and figures alone?

5.1 Business Storytelling

Business storytelling is the art of **using narratives to communicate ideas, values, and strategies** in a way that is memorable and persuasive. Instead of relying only on data and technical details, stories frame information in human terms, making it easier for audiences to relate and act.

Key Aspects of Business Storytelling:

1. **Purpose**
    - To explain complex ideas in simple, relatable ways.
    - To inspire trust and create emotional engagement.
    - To influence decision-making and motivate action.
2. **Structure of a Business Story**
    - **Beginning:** Introduce the problem or context.
    - **Middle:** Show the challenges and actions taken.
    - **End:** Present the resolution and desired impact.
3. **Types of Stories in Business**
    - **Customer Stories:** Showing how real people benefit from a product or service.
    - **Founding Stories:** Sharing the origin of an idea or company.
    - **Vision Stories:** Painting a picture of the future the organization is building.
    - **Data Stories:** Using numbers wrapped in a narrative to highlight trends or insights.
4. **Benefits of Storytelling in Business**
    - Makes presentations engaging and memorable.
    - Helps audiences understand "why" behind ideas.
    - Bridges logic (facts, data) with emotion (human impact).
    - Builds brand identity and trust.

Example:

When Airbnb was raising funds in its early days, instead of only showing market numbers, the founders told stories of travelers who couldn't afford hotels but found belonging through Airbnb homes. This narrative helped investors connect to the vision beyond just profit.

5.1.1 Importance of Storytelling in Design and Innovation

- **Why it matters:**

  Storytelling is not just about entertainment—it is a tool for **clarity, persuasion, and connection**.

  In design and innovation, stories help communicate abstract ideas in ways people can relate to.
- **Role in Design:**

- Converts technical prototypes into human-centered experiences.
- Helps explain "why" a product exists, not just "what" it does.
- Builds empathy by showing how users' problems are solved.

- **Role in Innovation:**
  - Inspires stakeholders to support risky or new ideas.
  - Creates alignment across teams by communicating vision clearly.
  - Turns early-stage ideas into compelling pitches for funding or adoption.

Example: When IDEO designers worked on a new medical device, they didn't just present specifications. They told the story of a nurse under pressure and showed how the device reduced stress, making the solution more persuasive.

5.1.2 Pixar Pitch Framework for Structuring Narratives

Pixar, known for creating memorable movies, uses a **simple storytelling formula** that also applies in business pitches.

- **Framework:**
  1. **Once upon a time…** (Introduce context)
  2. **Every day…** (Show the routine/problem)
  3. **One day…** (Trigger event/change)
  4. **Because of that…** (Consequences)
  5. **Until finally…** (Resolution/solution)
- **Why it works:**
  - Simple and memorable structure.
  - Creates emotional connection.
  - Builds a natural flow from problem → solution → impact.

Example:

For a food delivery startup:

- *Once upon a time,* busy professionals struggled to find time for cooking.
- *Every day,* they ordered unhealthy fast food.
- *One day,* our app introduced healthy meals with 20-minute delivery.
- *Because of that,* customers ate better without losing time.
- *Until finally,* the city embraced healthier living.

Did You Know?

"The famous Pixar storytelling formula ("Once upon a time… Every day… One day… Because of that… Until finally…") has been adopted by companies like **Google and LinkedIn** to train their employees in crafting persuasive presentations."

5.1.3 Hero's Journey and Its Relevance in Business Pitches

The **Hero's Journey** is a storytelling model often used in myths and films, but it is also powerful in business communication.

- **Stages Relevant to Business:**
    1. **The Ordinary World:** Introduce the everyday problem.
    2. **The Call to Adventure:** Present the challenge or gap.
    3. **The Hero's Struggle:** Show difficulties in solving the problem.
    4. **The Transformation:** Reveal how the innovation solves the issue.
    5. **The Return with Reward:** Highlight benefits for the user or society.
- **Why it's useful:**
    - Casts the **user** or **customer** as the "hero," not the company.
    - Makes the pitch engaging and memorable.
    - Shows the value of innovation through a journey, not just data.

Example: In a pitch for an educational app, the "hero" is the student struggling with exam prep. The app becomes the "guide" that helps them overcome stress and succeed.

"Activity: Crafting a Hero's Journey Pitch"

Instruction to Students:

1. Choose a product or service idea (real or imagined).
2. Frame a **Hero's Journey pitch** where the *customer* is the hero and your product is the *guide*.
    - Ordinary World: What problem does the customer face in daily life?
    - Call to Adventure: What change or challenge pushes them to act?
    - Struggle: What obstacles do they face without your solution?
    - Transformation: How does your product/service help overcome it?
    - Return with Reward: What benefits does the customer finally enjoy?
3. Write your pitch in **5–7 sentences** following this journey.
4. Present it as if you are pitching to a potential investor or customer.

5.1.4 Crafting Compelling Narratives for Stakeholders

When addressing stakeholders (investors, clients, users, or team members), the story must be tailored to their priorities.

- **Steps to Craft a Stakeholder Narrative:**
    1. **Know your audience:** Investors want growth potential, users want benefits, employees want clarity of purpose.
    2. **Frame the problem:** Start with a relatable pain point.
    3. **Show the solution:** Introduce the product or service clearly.
    4. **Highlight impact:** Explain measurable value and emotional benefit.
    5. **Call to action:** Make the next step obvious (invest, adopt, approve).
- **Techniques:**
    - Use data inside a story (e.g., "Every day, 1 million people face this issue…").
    - Add emotional hooks (real stories of users).
    - Keep it concise and structured.

Example: A sustainability startup pitching to investors might say:

"Every year, 8 million tons of plastic enter the ocean. Our innovation turns waste into reusable packaging. In pilot projects, we reduced plastic use by 60%. With your support, we can scale this globally."

5.2 Emotional Design in Narratives

Emotional design in narratives is about **moving beyond rational explanations** and creating connections that appeal to the human heart and mind. While facts inform, emotions persuade. When stories evoke emotions like trust, empathy, excitement, or hope, they become memorable and impactful. In business and design, emotional storytelling ensures that ideas do not just make sense, but also **feel relevant and inspiring**.

5.2.1 Understanding User Emotions in Storytelling

- **Why emotions matter in decision-making**

  Research in neuroscience shows that even logical decisions rely on emotional input. People are more likely to support or adopt ideas that "feel right."
    - *Example:* A customer buying a car is not only persuaded by mileage and safety data, but also by how confident, proud, or secure the car makes them feel.
- **Types of emotional triggers in narratives**

1. **Joy and Surprise:** Creates delight, making the audience smile or feel excited.

Example: Ads showing surprise reunions with loved ones after a long trip.

2. **Fear and Urgency:** Shows risks of inaction.

Example: Cybersecurity campaigns highlight how easy it is to get hacked.

3. **Hope and Aspiration:** Inspires people to imagine a better future.

Example: Education platforms showing how students' lives improve after learning new skills.

4. **Empathy and Relatability:** Helps people see themselves in the story.

Example: A bank ad showing parents saving for their child's dreams.

- **Application in design storytelling**

  Instead of simply saying, "Our app has a 2-second response time," a company might share: *"Imagine a mother in an emergency who gets instant access to a doctor within two seconds."* This paints an **emotional picture** of why speed matters.

5.2.2 Designing for Empathy and Connection

Empathy means going beyond demographics and understanding **what users feel, fear, and hope for**. Stories designed with empathy make audiences think, "This is about me."

- **Principles of empathetic design storytelling:**
  1. **Listen first:** Use interviews, surveys, and observations to discover real pain points.
  2. **Frame the user as the hero:** The product should be the "guide," not the hero.
  3. **Show shared struggles:** Highlight universal experiences (stress, time pressure, joy of success).
  4. **Offer relief and hope:** Present the product as the solution that restores balance.
- **Example in practice:**
  - A mental health startup avoids technical jargon. Instead, it shares stories like: *"We know what it feels like to lie awake at 2 a.m., anxious and alone. That's why we connect you instantly to a counselor who listens."*
- **Why it works:**

  This approach builds trust, reduces resistance, and makes innovation feel personal rather than abstract.

5.2.3 Using Visuals, Metaphors, and Analogies

Facts may be forgotten, but vivid imagery and relatable comparisons stay in memory. Visuals and linguistic tools like metaphors and analogies make stories **easier to grasp and emotionally engaging**.

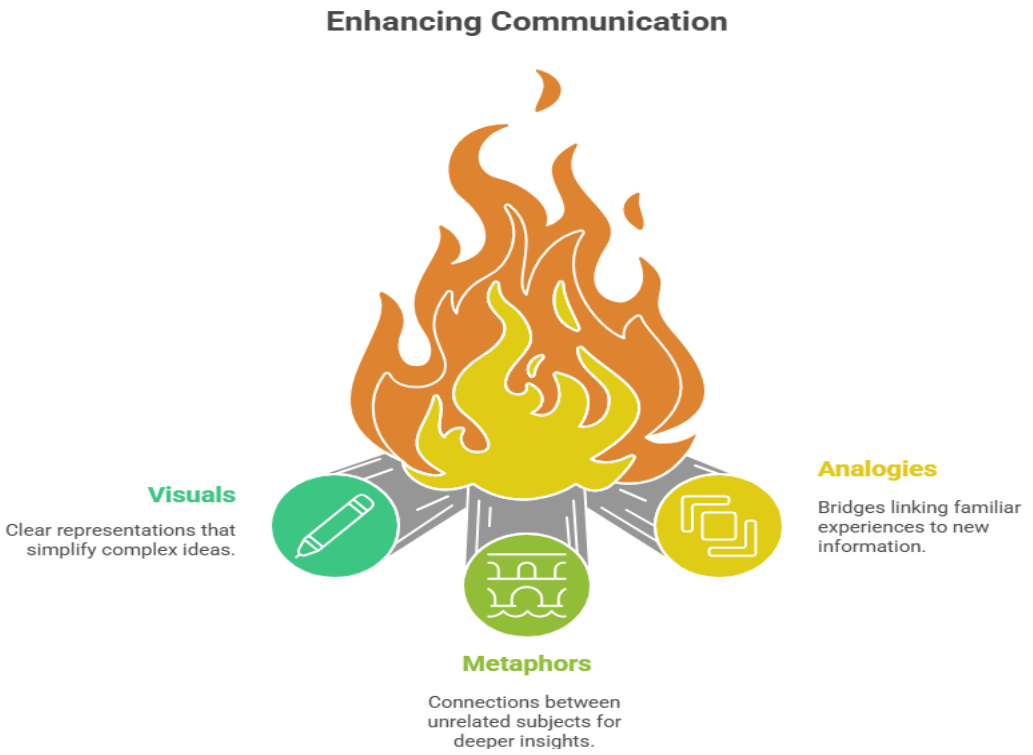

Figure 5.1

- **Visuals**
  - Use charts, photos, and videos to "show, not tell."
  - Example: Instead of saying "Our solution reduces carbon footprint," show two contrasting images: a polluted city skyline vs. a clear sky.
- **Metaphors**
  - Explain something unfamiliar by comparing it to something familiar.
  - Example: "Our cybersecurity system works like a digital lock on your front door—always protecting you, even when you're asleep."
- **Analogies**
  - Highlight similarities to known processes to simplify complex concepts.
  - Example: Cloud storage explained as "a digital backpack you can carry anywhere without feeling its weight."
- **Why it works:**

  Visuals appeal to the senses, metaphors appeal to imagination, and analogies create clarity—all of which strengthen emotional connection.

Did You Know?

"Cognitive scientists have found that people are **22 times more likely** to remember a fact if it is told through a story with metaphors, compared to when it is shared as plain data. This is why brands often use analogies like "cloud storage is your digital locker."

5.2.4 Case Examples of Emotional Storytelling in Products/Services

1. **Apple** – *Creativity and Lifestyle*
    - Apple rarely markets technical specifications first. Instead, campaigns like *"Shot on iPhone"* highlight personal memories, creativity, and moments captured by users, making the phone feel like a tool for life, not just technology.
2. **Nike** – *Perseverance and Empowerment*
    - "Just Do It" commercials show athletes overcoming struggles, whether it's physical disability, social barriers, or personal doubts. Shoes are not the star; human resilience is.
3. **Coca-Cola** – *Happiness and Togetherness*
    - Ads focus on sharing Coke with family and friends, positioning the drink as part of joyful experiences, not just refreshment.
4. **Airbnb** – *Belonging*
    - Instead of selling rooms, Airbnb sells the idea of "belonging anywhere," telling stories of travelers who find home-like comfort in foreign lands.
5. **Procter & Gamble (P&G)** – *Proud Sponsor of Moms*
    - During the Olympics, P&G ads show mothers supporting their children through struggles, highlighting gratitude and emotional bonds rather than product features.

Lesson: Emotional storytelling does not replace data—it enhances it by making people care about the numbers, the product, and the mission.

5.3 Pitching for Impact

A **pitch** is a concise and persuasive communication aimed at convincing stakeholders—whether investors, customers, or partners—about the value of an idea, product, or service. Pitching for impact means going

beyond presenting information: it's about structuring the message so that it is **clear, memorable, and motivating**.

5.3.1 Structuring a Clear and Persuasive Pitch

A successful pitch has a clear flow that builds logic and emotion together.

Typical Structure:

1. **Hook:** Start with a strong opening—statistics, a powerful question, or a story.
2. **Problem:** Define the challenge in relatable terms.
3. **Solution:** Present the product or service as the answer.
4. **Value:** Highlight what makes it unique and impactful.
5. **Evidence:** Use data, testimonials, or case studies for credibility.
6. **Call to Action:** Ask for investment, adoption, or partnership.

Example:

- Hook: "Every year, 8 million tons of plastic end up in the ocean."
- Problem: "Traditional packaging is unsustainable."
- Solution: "Our startup produces biodegradable packaging at 40% lower cost."
- Value: "It's cheaper, scalable, and environmentally safe."
- Call to Action: "We are seeking $2 million to scale operations nationwide."

5.3.2 Tailoring the Pitch for Investors, Customers, and Partners

Different audiences care about different things, so the same pitch must be adapted.

- **Investors:**
  - Focus on growth potential, profitability, and scalability.
  - Example: Show market size, financial projections, and exit opportunities.
- **Customers:**
  - Highlight benefits, usability, and how the product improves their life.
  - Example: Emphasize convenience, savings, or emotional satisfaction.
- **Partners (suppliers, collaborators, distributors):**
  - Stress long-term collaboration, shared values, and mutual benefits.
  - Example: Outline reliability, cost-sharing, and synergy opportunities.

Tip: The **core story remains the same**, but the emphasis changes depending on the audience.

5.3.3 Communicating Value Propositions and Impact

A value proposition explains **why someone should choose your solution** over alternatives. It should be short, clear, and outcome-focused.

- **Elements of a Strong Value Proposition:**
    1. **Problem solved:** What challenge do you address?
    2. **Unique solution:** How do you solve it differently or better?
    3. **Tangible impact:** What measurable benefits result?
- **Framing Impact:**
    - Social impact: "Our water filters give rural families safe drinking water."
    - Economic impact: "Our AI tool reduces operating costs by 30%."
    - Personal impact: "Our app saves busy parents 5 hours every week."

Example: Tesla's value proposition isn't just "electric cars." It's about *"high-performance, sustainable transport that accelerates the world's transition to clean energy."*

5.3.4 Common Pitfalls in Pitches and How to Avoid Them

Even strong ideas fail if the pitch is poorly delivered. Some common pitfalls include:

1. **Information Overload**
    - Problem: Including too many details confuses the audience.
    - Solution: Keep it focused on essentials, with supporting data in backup slides.
2. **Weak Storytelling**
    - Problem: Over-reliance on numbers without a human story.
    - Solution: Add user experiences, anecdotes, or relatable examples.
3. **Ignoring the Audience**
    - Problem: Using the same pitch for all stakeholders.
    - Solution: Customize based on what matters most to each audience.
4. **Unclear Ask**
    - Problem: Not specifying what you want (investment, partnership, purchase).
    - Solution: End with a strong, precise call to action.
5. **Overpromising**
    - Problem: Making unrealistic claims damages credibility.
    - Solution: Be ambitious but back claims with data and proof.

Example of failure: A startup pitch focusing only on futuristic features without clarifying how they will execute—leaving investors doubtful.

5.4 Designing for Long-Term Impact

Designing for long-term impact means going beyond short-term functionality or profit. It emphasizes how products, services, and systems affect **society, culture, environment, and future generations**. Designers today must integrate **responsibility, sustainability, and ethical considerations** into their innovations.

5.4.1 Social and Cultural Dimensions of Design

- **Why it matters:**
  Design does not exist in isolation—it shapes and is shaped by social and cultural contexts. Ignoring these dimensions can lead to solutions that are technically sound but socially irrelevant or even harmful.
- **Social Dimensions:**
  - Addressing inclusivity (design for diverse abilities, genders, and age groups).
  - Improving accessibility (products usable by people with disabilities).
  - Supporting equity (affordable solutions for marginalized communities).
- **Cultural Dimensions:**
  - Respecting traditions, values, and local practices.
  - Avoiding designs that unintentionally offend or exclude cultural groups.
  - Incorporating cultural identity into product storytelling.

Example: Mobile banking apps in developing countries include support for regional languages and simple navigation to ensure that even first-time users can access financial services.

5.4.2 Designing for Sustainability and Ethical Responsibility

- **Sustainability in Design:**
  - Use of renewable materials.
  - Energy-efficient production processes.
  - Circular design: products that can be reused, repaired, or recycled.
- **Ethical Responsibility:**
  - Fair labor practices in supply chains.
  - Transparent communication (no false claims in marketing).
  - Data privacy and protection in digital products.

Example: Patagonia, a clothing brand, promotes long-lasting apparel and even encourages customers to repair products instead of buying new ones—aligning with environmental responsibility.

Did You Know?

"Patagonia, the outdoor clothing brand, once ran an ad that said, **"Don't Buy This Jacket"**, encouraging customers to repair old clothes instead of buying new ones. This counterintuitive storytelling-built trust and strengthened its reputation for environmental responsibility."

5.4.3 Measuring Social and Cultural Impact

Design is not just about usability or aesthetics—it should aim to create **positive change in people's lives**, especially in social innovation, public services, education, healthcare, or sustainability. However, for this change to be meaningful, it must be **measurable**. Measuring **social and cultural impact** helps teams understand **how their solutions affect individuals, communities, and systems** over time.

Why Measure Impact?

- To assess whether the solution is **actually improving lives**, not just performing functionally
- To guide **future improvements** and design iterations
- To demonstrate **accountability** to funders, partners, or communities
- To **build trust** with stakeholders by showing real results
- To identify and **mitigate unintended consequences**

Methods of Measuring Social and Cultural Impact

A combination of **qualitative** (story-based) and **quantitative** (data-based) methods provides a more complete picture.

1. Surveys and Interviews

- Collect user perceptions, satisfaction, and emotional responses
- Identify behavior changes or improvements in quality of life
- Can be structured (scored) or open-ended (narrative)

Example: Asking caregivers if a telehealth app made them feel more supported and in control.

2. Usage Data and Metrics

- Track number of users, frequency of use, drop-off rates, and feature engagement
- Useful for seeing if a tool is being adopted and sustained

Example: A rural learning app shows daily logins from students across districts over 3 months.

3. Social Indicators

- Broader societal-level data such as:
    - Literacy rates
    - Access to clean water
    - Reduced dropout rates
    - Increased access to healthcare
- May be tracked by NGOs, governments, or independent studies

Example: Comparing pre- and post-intervention school attendance rates in villages using the educational app.

4. Cultural Fit and Acceptance

- Community attitudes and willingness to integrate the solution into daily life
- Observed through pilot studies, community discussions, or feedback loops

Example: A sanitation product designed for urban slums is well-adopted because it respects local customs around hygiene.

5. Case Studies and Testimonials

- Collect detailed, real-world stories that illustrate impact on individuals or families
- Offers **emotional and contextual depth** not found in numbers

Quote from user: "Since we started using the app, my daughter doesn't miss school, and I can see her scores improving."

6. Participatory Feedback Mechanisms

- Co-evaluation with users, community leaders, or field staff
- Encourages **ownership and inclusivity** in impact assessment

Example: Community review boards in tribal areas help evaluate a health awareness program's reach and relevance.

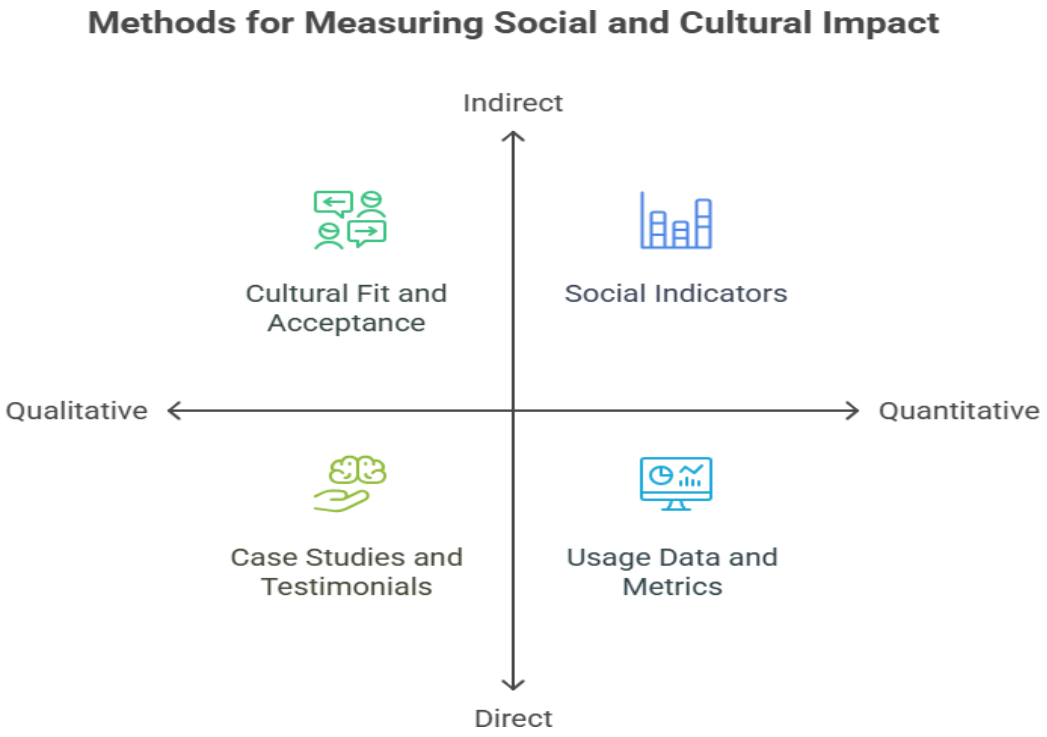

Figure 5.1

Challenges in Measuring Impact

Challenge	**Mitigation Strategy**
Impact is **long-term and slow**	Set short-, mid-, and long-term indicators
Hard to **isolate cause**	Use control groups or before-after comparisons
Data may be **incomplete or biased**	Combine multiple sources and triangulate findings
Cultural change is **hard to quantify**	Use qualitative stories and ethnographic insights
Risk of **overclaiming** impact	Be honest about what has and hasn't worked

Real-World Example

Project: Rural Education App

- **Goal:** Improve student engagement and outcomes in low-resource schools

- **Quantitative Indicators:**
  - 25% increase in school attendance
  - Improved test scores in English and Math
- **Qualitative Indicators:**
  - Parental feedback reporting increased motivation among children
  - Teachers observed greater participation in class
- **Cultural Fit:**
  - App includes regional languages and works offline, increasing acceptability
  - Audio-based content supports non-literate parents in helping their children

Best Practices for Measuring Social and Cultural Impact

Practice	Description
Define success early	Set clear, measurable goals during the design phase
Use mixed methods	Combine numbers and narratives for a holistic view
Engage the community	Include users in shaping what success looks like
Monitor continuously	Don't just evaluate at the end—track impact over time
Report transparently	Share both positive outcomes and areas needing improvement

5.4.4 Embedding Impact into Business and Service Models

- **Why embedding matters:**

  Long-term impact cannot be an afterthought; it must be built into the core of a business model.
- **Ways to Embed Impact:**
  1. **Mission-Driven Design:** Define social or environmental goals as part of the company's mission.
  2. **Shared Value Models:** Align profit with positive social outcomes.
  3. **Continuous Feedback Loops:** Regularly gather community insights to adapt services.
  4. **Partnerships:** Collaborate with NGOs, governments, and local groups to expand impact.
- **Example:**
  - **TOMS Shoes** built "One for One" into its model: for every pair sold, one pair was donated.
  - **Grameen Bank** embedded microfinance into its business model to empower rural women economically.

Knowledge Check 1

Choose the correct option:

1. Which of the following best describes the purpose of business storytelling?
   A) To replace data with fictional stories
   B) To communicate ideas in a relatable, persuasive way
   C) To avoid logical reasoning in business communication
   D) To make presentations longer and detailed
2. The Pixar Pitch framework is structured around which sequence?
   A) Problem → Solution → Call to Action
   B) Once upon a time… → Every day… → One day… → Because of that… → Until finally…
   C) Hook → Data → Impact → Ask
   D) Hero → Struggle → Transformation → Reward
3. In the Hero's Journey applied to business pitches, who is usually cast as the "hero"?
   A) The investor
   B) The product
   C) The customer
   D) The entrepreneur
4. Which of the following storytelling tools makes abstract concepts more relatable by comparing them to familiar ones?
   A) Visuals
   B) Data charts
   C) Metaphors and analogies
   D) Bullet points
5. Which audience primarily looks for profitability, growth potential, and scalability in a pitch?
   A) Customers
   B) Partners
   C) Investors
   D) Employees

5.5 Summary

- This chapter highlighted how **storytelling, emotion, pitching, and impact-driven design** come together to shape innovation. It began with **business storytelling** as a tool to communicate ideas persuasively, then explored how **emotional design in narratives** deepens user connection. Next, the chapter examined **pitching for impact**, focusing on clear structures, tailored messaging, and avoiding common pitfalls. Finally, **designing for long-term impact** emphasized social, cultural, and ethical responsibility in shaping sustainable innovations.
- Together, these concepts show that lasting innovation is not just about solving problems—it is about **inspiring people, earning trust, and embedding positive change into society**.

5.6 Key Terms

1. **Business Storytelling** – Using narratives to communicate ideas, vision, and value in a relatable way.
2. **Pixar Pitch** – A narrative framework structured as "Once upon a time… One day… Because of that… Until finally…"
3. **Hero's Journey** – A storytelling model where the user is framed as the hero and the product as a guide.
4. **Emotional Design** – Crafting stories or products that connect with users' feelings such as trust, empathy, or hope.
5. **Metaphors & Analogies** – Linguistic tools to simplify complex ideas through relatable comparisons.
6. **Value Proposition** – A clear statement explaining the unique benefits of a product or service.
7. **Pitching** – Concise and persuasive communication aimed at convincing stakeholders.
8. **Social Dimensions of Design** – The way design decisions affect inclusivity, accessibility, and equity.
9. **Cultural Dimensions of Design** – Ensuring designs respect traditions, values, and diversity.
10. **Sustainability in Design** – Creating products and services with minimal environmental impact and ethical responsibility.

5.7 Descriptive Questions

1. Explain the importance of storytelling in design and innovation with an example.
2. Describe the Pixar Pitch framework and its relevance in business communication.
3. How does the Hero's Journey model strengthen business pitches?
4. Discuss the role of empathy in emotional design and user connection.
5. What is the significance of visuals, metaphors, and analogies in storytelling?
6. How should pitches be tailored differently for investors, customers, and partners?
7. Define a value proposition and explain its role in pitching for impact.
8. What are the social and cultural dimensions of design, and why are they important?

9. How can businesses measure social and cultural impact of their innovations?
10. Evaluate Tesla's approach to storytelling and cultural impact with reference to this chapter's concepts.

5.8 References

1. Denning, S. (2011). *The Leader's Guide to Storytelling: Mastering the Art and Discipline of Business Narrative*. Jossey-Bass.
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5. Christensen, C. M. (1997). *The Innovator's Dilemma*. Harvard Business Review Press.
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Answers to Knowledge Check

Knowledge check 1

1. B) To communicate ideas in a relatable, persuasive way
2. B) Once upon a time… → Every day… → One day… → Because of that… → Until finally…
3. C) The customer
4. C) Metaphors and analogies
5. C) Investors

5.9 Case Study

Tesla – Storytelling, Pitching, and Designing for Cultural Impact

Introduction

Tesla is more than just an electric vehicle company—it is a brand built on **powerful storytelling, impactful pitching, and a commitment to cultural transformation**. From Elon Musk's investor pitches to Tesla's marketing campaigns, the company demonstrates how narrative and design can drive long-term social and cultural change.

Background

When Tesla entered the automobile market, skepticism was high: electric cars were seen as slow, impractical, and unattractive. Instead of focusing only on specifications, Tesla reframed the conversation. Their narrative was not just about cars—it was about **accelerating the world's transition to sustainable energy**.

This vision became Tesla's story, influencing every pitch, product, and strategy.

Problem Statement 1: Market Resistance to Electric Cars

Most people associated electric cars with low speed, limited range, and high cost.

Solution:

Tesla positioned its cars as high-performance vehicles that were **desirable first, sustainable second**. By telling stories of speed (Model S outrunning sports cars) and innovation, Tesla shifted the emotional narrative.

MCQ:

How did Tesla overcome skepticism toward electric cars?

A) Focused only on government subsidies

B) Highlighted high performance and innovation

C) Reduced marketing and relied only on engineers

D) Ignored cultural perceptions of cars

Problem Statement 2: Investor Doubt in Scalability

Investors doubted whether Tesla could compete with established automakers.

Solution:

Elon Musk used **pitching frameworks** combining storytelling and data. He explained Tesla's

mission (story), showed demand projections (data), and laid out a roadmap from premium cars to mass-market vehicles (logic).

MCQ:

What approach did Elon Musk use to convince investors?

A) Only technical details and specifications

B) Only emotional appeal without data

C) A mix of storytelling, data, and logical roadmap

D) Avoiding future planning in pitches

Problem Statement 3: Embedding Cultural Impact

Electric mobility needed to be more than a product—it had to become a cultural shift.

Solution:

Tesla embedded **long-term impact** into its business model. From building supercharger networks to open-sourcing patents, Tesla's actions told a story of global leadership in sustainability, not just profit.

MCQ:

How did Tesla embed cultural impact into its strategy?

A) By focusing only on selling luxury cars

B) By limiting innovation to internal use

C) By building ecosystems (chargers, patents, sustainability vision)

D) By ignoring environmental responsibility

Conclusion

Tesla's journey shows how **storytelling, pitching, and cultural design impact** reinforce one another. Storytelling reframed the electric car as exciting, pitching persuaded investors through a blend of data and vision, and embedding long-term cultural impact made Tesla a global leader in sustainability.

This case proves that innovation is not only about products—it is about **creating movements that inspire, persuade, and last**.

Unit 6: Emerging Trends in Product & Service Design

Learning Objectives

1. Define the structure and functions of the money market, distinguishing it from capital markets.
2. Identify and describe the characteristics, participants, and instruments of the Indian money market.
3. Explain the features, maturity periods, and issuance process of Treasury Bills (T-Bills) and Commercial Papers (CP).
4. Compare different short-term money market instruments such as Commercial Bills, Certificates of Deposit (CDs), and Call/Notice Money, focusing on liquidity, risk, and yield.
5. Illustrate how Collateralised Borrowing and Lending Obligations (CBLO) function in secured interbank lending, including the role of collateral.
6. Evaluate the suitability of different money market instruments for banks, corporates, and government entities in managing short-term funding requirements.
7. Apply knowledge of money market operations to interpret market trends and assist in short-term investment or borrowing decisions.

Content

6.0 Introductory Caselet

"The Silent Assistant: A Conversation between Aarav and His Professor"

Background:

Aarav, a final-year engineering student, notices how AI tools are becoming part of daily life—from voice assistants setting alarms to recommendation engines suggesting music and movies. Yet, he wonders whether these systems truly "understand" users or simply automate tasks.

One evening, while working late in the university lab, Aarav shares his doubts with his professor. The professor smiles and replies:

"AI is not just about replacing human effort—it is about designing experiences where intelligence is woven into the product from the very beginning. The real challenge is not whether AI can answer a question, but whether it can anticipate needs, adapt to context, and build trust with users."

Over the next few weeks, Aarav explores how businesses are shifting from adding AI as an afterthought to creating **AI-first products and services**—designed around intelligence, adaptability, and continuous learning. He realizes that this shift represents not just a technological upgrade, but a new philosophy of design.

Critical Thinking Question:

How does designing with an AI-first approach differ from simply adding AI features to an existing product?

6.1 Designing for AI-First Products & Services

An **AI-first approach** means that artificial intelligence is not an "add-on" but the **core foundation** of how a product or service is conceived, developed, and delivered. Unlike traditional design, where AI may appear as a feature at the end, AI-first design **starts with intelligence as the driver of user experience**.

Key Characteristics of AI-First Design

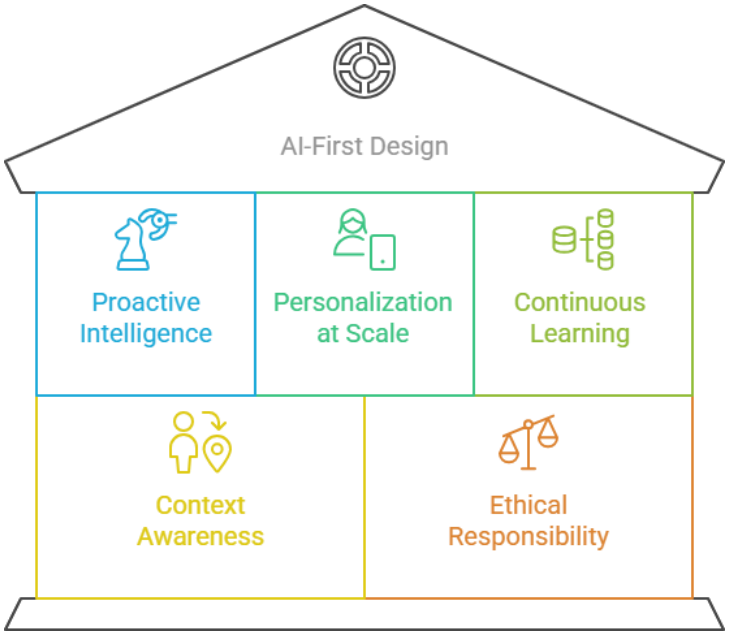

Figure 6.2

1. **Proactive Intelligence**
    - AI anticipates user needs before they are explicitly expressed.
    - Example: Google Photos automatically categorizing memories, or Netflix predicting shows users will enjoy.
2. **Personalization at Scale**
    - Experiences are tailored individually, even across millions of users.
    - Example: Spotify's "Discover Weekly" playlist is unique for every listener, updated by AI.
3. **Continuous Learning**
    - The product improves with time as more data is collected.
    - Example: Chatbots that become better at answering queries as they interact with more users.
4. **Context Awareness**
    - AI adapts based on location, device, or situation.

- Example: A smart thermostat adjusting temperatures differently in summer evenings vs. winter mornings.

5. **Ethical Responsibility**
   - Designing AI-first products also means addressing fairness, transparency, and user trust.
   - Example: An AI loan approval system must avoid bias and explain its decisions clearly.

Why AI-First Matters

- **Shift in User Expectations:** People no longer want static apps—they expect adaptive, intelligent experiences.
- **Competitive Advantage:** Companies adopting AI-first design differentiate themselves by offering smarter, more efficient services.
- **Scalability:** AI allows services to handle complexity and large user bases without proportional increases in human resources.

Example Applications

- **Healthcare:** AI-first diagnostic tools detect diseases early by analyzing scans faster and more accurately than human specialists.
- **Retail:** Personalized recommendations and dynamic pricing driven by AI.
- **Transport:** Autonomous vehicles designed entirely around AI decision-making.
- **Education:** Adaptive learning platforms that modify lessons based on student progress.

6.1.1 Characteristics of AI-First Design

AI-first design is built on the idea that **intelligence is at the core of the product or service**, not just an added feature. Key characteristics include:

1. **Proactive Intelligence** – Systems anticipate user needs instead of waiting for commands. *Example:* Gmail's Smart Compose predicts entire sentences as users type.
2. **Continuous Learning** – AI adapts and improves with more data over time. *Example:* Google Maps constantly updates traffic predictions based on live user data.
3. **Context Awareness** – Products adjust based on user location, behavior, or environment. *Example:* A smartwatch detecting if the user is running, walking, or sleeping and adapting functions accordingly.
4. **Scalability** – AI enables services to handle millions of users with minimal manual effort. *Example:* ChatGPT answering unique queries for users worldwide simultaneously.

5. **Ethical Responsibility** – Designing for fairness, transparency, and accountability. *Example:* AI hiring tools being checked for bias to ensure fair recruitment.

Did You Know?

"Google Maps' live traffic predictions are powered by AI analyzing data from **over 1 billion Android devices**, making it one of the largest real-time AI-first design implementations in the world."

6.1.2 Personalization, Prediction, and Automation

AI-first products stand out because they deliver **personalized, predictive, and automated experiences**.

- **Personalization**
  - Customizes experiences for individual users.
  - *Example:* Netflix recommending unique shows for each subscriber.
- **Prediction**
  - Forecasts what users will need or want before they ask.
  - *Example:* Amazon predicting what items a user may reorder based on past behavior.
- **Automation**
  - Handles repetitive or complex tasks without manual intervention.
  - *Example:* Autonomous vehicles navigating traffic, or banking apps automating monthly bill payments.

Why it matters: These three features reduce user effort, create delight, and increase product stickiness.

6.1.3 Human-AI Collaboration in Design

AI-first does not mean replacing humans—it means **augmenting human capabilities**.

- **Designer as Guide:**
  Designers must decide how AI supports, rather than overwhelms, human decision-making.
- **Human-in-the-Loop Systems:**
  AI makes recommendations, but humans take final decisions in critical contexts.
  Example: In healthcare, AI scans may suggest possible diseases, but doctors confirm the diagnosis.

- **Co-Creation:**

  AI tools can accelerate creativity by generating ideas that humans refine.

  Example: Canva's AI-powered design suggestions help non-designers create professional layouts.
- **Trust and Transparency:**

  Users need to understand how AI decisions are made. Clear explanations build confidence.

  Example: LinkedIn explaining why certain job postings are recommended to a user.

6.1.4 Case Examples of AI-First Products

1. **Spotify (Personalization at Scale)**
   - Uses AI to analyze listening habits and deliver customized playlists like *Discover Weekly*.
2. **Tesla Autopilot (Prediction & Automation)**
   - AI predicts traffic conditions and automates driving decisions, enabling semi-autonomous travel.
3. **Duolingo (Adaptive Learning)**
   - Lessons adapt in difficulty based on user progress, keeping learners challenged but not overwhelmed.
4. **Amazon Alexa (Context Awareness)**
   - Learns user habits over time—like preferred music, shopping items, or daily routines—and automates responses.
5. **Grammarly (Human-AI Collaboration)**
   - AI suggests corrections, tone adjustments, and clarity improvements while the human user makes final choices.

6.2 Sustainability & Circular Design Principles

Sustainability and circular design principles emphasize creating products and services that minimize waste, extend lifecycles, and reduce environmental harm. Instead of the traditional **"take–make–dispose"** model, designers now focus on systems where resources are used efficiently and reintroduced into the economy.

6.2.1 Concept of Circular Economy in Design

- **Definition:**

  The circular economy is a system where resources are kept in use for as long as possible, extracting maximum value, and then regenerated at the end of their lifecycle.

- **Core Principles:**
    1. **Eliminate Waste and Pollution** – Prevent problems at the design stage.
    2. **Keep Products and Materials in Use** – Through reuse, refurbishment, and recycling.
    3. **Regenerate Natural Systems** – Support ecosystems rather than deplete them.
- **Example:** Philips offers "lighting-as-a-service," where customers pay for light but Philips retains ownership of equipment, ensuring parts are reused and recycled.

Did You Know?

"The **Ellen MacArthur Foundation** estimates that shifting to a circular economy could generate **$4.5 trillion in economic benefits by 2030**, showing that sustainability is not just ethical but also highly profitable."

6.2.2 Designing for Repair, Reuse, and Recycling

- **Design for Repair:**
  Products should be easy to fix instead of being discarded.
  Example: Fairphone designs smartphones with modular parts that users can replace.
- **Design for Reuse:**
  Products or packaging can be reused multiple times, extending value.
  Example: Refillable water bottles and reusable shopping bags.
- **Design for Recycling:**
  Materials should be chosen and designed so they can be recycled efficiently.
  Example: Aluminum cans are infinitely recyclable without losing quality.

Key Idea: Products should be designed for **longer lifespans**, not short-term disposal.

"Activity: Redesigning Everyday Products for Sustainability"

Instruction to Students:

1. Select a product you use daily (e.g., smartphone, laptop, water bottle, or clothing item).
2. Analyze its current lifecycle: How is it made, used, and eventually disposed of?
3. Redesign the product using **repair, reuse, and recycling principles**:
    - What parts could be made modular or easier to repair?

- How could it be reused in different contexts?
- What materials could be chosen for easier recycling?

4. Write a **short 300-word report** or create a sketch showing your redesigned product and explain how it extends the product's life and reduces waste.

6.2.3 Sustainable Materials and Manufacturing

As global concerns about climate change, pollution, and resource depletion intensify, **sustainable design** has become a critical responsibility for designers, engineers, and manufacturers. Sustainable materials and manufacturing practices aim to **minimize environmental harm** throughout a product's life cycle—right from raw material sourcing to production, use, and disposal.

Sustainable product design is not just about reducing impact—it is also about creating **long-term value**, improving **supply chain responsibility**, and responding to **increasing consumer demand for ethical products**.

1. Sustainable Materials

Sustainable materials are those that have a **low environmental footprint** across their entire life cycle. They are often renewable, recyclable, biodegradable, or made from waste.

Key Characteristics

- Require **less energy or water** to produce
- Cause **minimal pollution** during extraction and processing
- Support **reuse, recycling, or composting** at the end of life
- Are often sourced **ethically and responsibly**

Examples of Sustainable Materials

Material	Description	Applications
Biodegradable Plastics	Break down naturally without leaving harmful residues	Packaging, disposable utensils
Bamboo	Fast-growing, renewable, requires no fertilizers or pesticides	Furniture, textiles, toothbrushes
Hemp	Durable, low water consumption, grows without pesticides	Fabrics, bio-composites, bags
Recycled Textiles	Made from post-consumer or industrial fabric waste	Fashion, upholstery, footwear

Mycelium (Mushroom Leather)	Grown from fungi, compostable, animal-free alternative to leather	Packaging, bags, wallets
Recycled Metals and Glass	Use less energy compared to raw extraction; infinitely recyclable	Electronics, containers, construction

Designers are increasingly turning to **bio-based**, **plant-derived**, or **post-consumer waste** materials to reduce dependency on virgin resources and lower emissions.

2. Sustainable Manufacturing

Sustainable manufacturing involves the use of **eco-efficient processes and systems** that reduce negative environmental and social impacts, while conserving energy and natural resources.

Core Principles of Sustainable Manufacturing

1. **Use of Renewable Energy**
    - Manufacturing powered by solar, wind, or hydro energy reduces reliance on fossil fuels and lowers greenhouse gas emissions.
2. **Minimizing Energy and Water Consumption**
    - Implementing **energy-efficient machinery**, **closed-loop cooling systems**, and **smart sensors** to monitor usage helps reduce waste.
3. **Carbon Emission Reduction**
    - Shorter, localized supply chains reduce transportation-related emissions.
    - Lightweight or compact product designs can further reduce shipping impact.
4. **Waste Reduction and Circularity**
    - Using scrap materials, reusing industrial waste, and designing for disassembly or recycling are all part of a circular design mindset.
5. **Cleaner Production Processes**
    - Reducing or eliminating the use of toxic chemicals and solvents
    - Investing in **clean technologies** and **low-emission production lines**

3. Social and Ethical Considerations

Sustainability also includes **fair labor practices**, **safe working conditions**, and **community impact**. Responsible manufacturers must:

- Ensure **ethical sourcing** of raw materials (e.g., conflict-free minerals)
- Provide **safe and fair employment** in factories
- Respect **indigenous rights** and **land use practices** when sourcing natural materials

Real-World Example

Adidas x Parley for the Oceans

Adidas partnered with Parley to develop footwear made from **recycled ocean plastic waste**. The initiative not only reduced marine pollution but also demonstrated how large-scale manufacturing can align with environmental goals. Millions of pairs of shoes have been sold using this model, proving that **sustainability and innovation can co-exist**.

Challenges in Sustainable Manufacturing

Challenge	Mitigation Strategy
Higher upfront costs	Long-term savings and increased brand value
Limited availability of eco-materials	Investing in material innovation or forming supplier partnerships
Lack of consumer awareness	Education, transparency, and clear communication
Complex supply chain integration	Using digital tools for supply chain traceability

6.2.4 Business Benefits of Sustainable Design

Sustainable and circular design is not only good for the planet—it also delivers business advantages.

1. **Cost Savings:** Efficient resource use and recycling reduce raw material expenses.
2. **Brand Reputation:** Customers increasingly prefer eco-friendly brands.
3. **Regulatory Compliance:** Governments promote stricter sustainability standards.
4. **Market Differentiation:** Innovative sustainable products stand out from competitors.
5. **Long-Term Value:** Products designed for durability foster customer loyalty.

Example: Tesla benefits from positioning itself as both innovative and sustainable, leading to stronger customer engagement and investor trust.

6.3 Ethical Design & Inclusivity

Ethical design ensures that products and services are created with fairness, transparency, and responsibility in mind. Inclusivity goes further by ensuring **all people—regardless of age, ability, gender, culture, or location—can access and benefit** from the design. Together, they shape innovations that are **not only functional but also just and equitable**.

6.3.1 Principles of Ethical Design

Ethical design is grounded in values that prioritize human well-being over profit or convenience.

Figure 6.2

- **Core Principles:**
    1. **Transparency:** Users should know how products work and how their data is used.
    2. **Fairness:** Avoid exploiting vulnerabilities or excluding groups.
    3. **Accountability:** Designers and organizations must take responsibility for consequences.
    4. **Sustainability:** Protect people and the planet in design choices.
    5. **User Autonomy:** Empower users to make informed decisions without manipulation.
- **Example:** Apple introduced *App Tracking Transparency* so users can choose whether apps collect their data.

6.3.2 Accessibility and Inclusive Product Development

Modern product development must prioritize **accessibility** and **inclusion** to ensure that solutions are usable by **everyone**, regardless of ability, location, age, language, or socio-economic background. While accessibility often focuses on removing barriers for people with disabilities, inclusive design goes further—it aims to create **equitable experiences** by considering a wide range of **human diversity** in ability, culture, identity, and context.

Building inclusive products is not only an ethical responsibility but also enhances innovation, expands market reach, and improves overall user experience.

Understanding Accessibility

Accessibility refers to the design of products, services, or environments so that they are usable by people with **disabilities**, including:

- Visual (e.g., blindness, low vision)
- Auditory (e.g., deafness, hearing loss)
- Motor (e.g., limited mobility, tremors)
- Cognitive (e.g., learning difficulties, memory impairments)

Common Accessibility Features

Feature	Purpose
Screen Readers	Convert on-screen text into audio for visually impaired users
Subtitles and Captions	Provide audio information as text for users with hearing loss
Keyboard Navigation	Enables use without a mouse, helpful for users with motor impairments
Adjustable Font Sizes	Supports users with low vision or dyslexia
High-Contrast and Dark Modes	Improves legibility in various lighting conditions
Voice Input/Command Features	Helps users with limited hand movement interact with systems

What Is Inclusive Design?

Inclusive design takes a **broader, proactive approach**—it doesn't just respond to special needs; it **anticipates diversity** in users and designs from the outset to be as inclusive as possible.

Inclusive Development Practices

Practice	Benefit
Involve diverse users in testing	Surfaces challenges early from different perspectives
Design for variable connectivity	Supports both urban and rural users (e.g., low-bandwidth versions)
Support multiple languages and scripts	Expands accessibility for non-native speakers
Consider cultural sensitivities	Avoids inappropriate symbols, colors, or gestures across regions
Flexible layouts and content formats	Adapts to different devices, screen sizes, or assistive tech
Use plain and simple language	Makes content easier to understand for all education levels

Why Accessibility and Inclusion Matter

- **Legal Compliance**: Many countries have laws mandating digital accessibility (e.g., ADA in the U.S., RPWD Act in India, WCAG guidelines globally).
- **Wider Reach**: One billion people globally live with some form of disability—designing for them expands your market.
- **Improved Usability**: Features like captions or dark mode benefit all users, not just specific groups.
- **Brand Trust and Equity**: Inclusive design reflects social responsibility and builds a positive brand image.

Real-World Example

Microsoft's Xbox Adaptive Controller

- Designed specifically for gamers with limited mobility.
- Supports external switches, buttons, and joysticks based on user needs.
- Developed in collaboration with advocacy groups and real users.
- Demonstrates that inclusive products can be **innovative, scalable, and empowering**.

Another example is **Google Maps** introducing features like wheelchair-accessible routes and voice-guided navigation for visually impaired users—useful for **all kinds of situational or permanent limitations**.

Best Practices for Accessibility and Inclusion

Action	Description
Follow Accessibility Guidelines	Use standards like **WCAG 2.1** for web and app accessibility
Test with Real Users	Go beyond checklists—observe how diverse users actually interact with your product
Use Semantic Markup	Helps screen readers understand structure and content
Avoid Relying on Color Alone	Combine color with labels or patterns for users with color blindness
Add Accessibility Tags and Metadata	Improve discoverability and usability of images, videos, and documents

6.3.3 Addressing Bias in AI and Digital Products

Artificial Intelligence (AI) and digital technologies are increasingly embedded in daily life—from job recruitment platforms and health diagnostics to banking, e-commerce, and social media. However, these systems are **not inherently neutral**. They often **inherit and amplify biases** from the data they are trained on or from the assumptions made during their development.

Why Bias Matters

Unchecked bias in AI systems can lead to:

- **Unfair or discriminatory outcomes**
- **Erosion of user trust**
- **Legal and reputational consequences**
- **Reinforcement of systemic inequalities**

Addressing bias is not just a technical challenge—it is a **moral, social, and design imperative**.

Types of Bias in AI

AI bias can manifest in several ways, often reflecting historical or societal imbalances:

Type of Bias	Description	Example
Gender Bias	AI performs better for one gender due to skewed training data	Voice assistants responding more accurately to male voices
Racial Bias	Systems underperform on or misidentify people of certain racial groups	Facial recognition failing to recognize darker skin tones
Socioeconomic Bias	Algorithms favor users from wealthier backgrounds or specific geographies	Loan approval tools rejecting applicants from poor neighborhoods
Cultural Bias	AI fails to understand local context or customs	Content moderation mislabeling culturally specific expressions
Disability Bias	Systems are not designed to accommodate different physical or cognitive abilities	Virtual assistants unable to understand speech impairments
Age Bias	Older adults are underrepresented in usability or behavioral data	Interfaces too complex or fast-paced for senior users

Sources of AI Bias

1. **Biased Training Data**: If datasets are not representative of all users, the system will perform poorly for underrepresented groups.
2. **Labeling Errors**: Human annotators may bring unconscious bias into the way data is tagged.
3. **Algorithmic Design Choices**: The way models are optimized may inadvertently prioritize accuracy over fairness.
4. **Lack of Diverse Perspectives**: Homogeneous development teams may overlook ethical implications or edge cases.

Strategies to Address Bias

Designers, engineers, and policymakers can work together to minimize and manage AI bias through a combination of technical, ethical, and organizational strategies:

1. Use Diverse and Representative Datasets

- Ensure that training data reflects the full range of user demographics, behaviors, and contexts.
- Actively seek data from underrepresented populations.
- Audit datasets for missing or skewed categories before training begins.

2. Audit Algorithms Regularly

- Conduct **bias testing** across different user segments.
- Use fairness metrics (e.g., equal false positive rates across groups).
- Implement **third-party audits** or ethics review boards for high-stakes systems (e.g., hiring, lending, healthcare).

3. Build Explainable AI (XAI)

- Develop systems that offer **transparent reasoning** for their decisions.
- Let users understand why an output was generated (e.g., why a loan was denied).
- Improve accountability and user trust.

4. Involve Multidisciplinary Teams

- Blend technical roles (data scientists, engineers) with experts in:
    - **Ethics**
    - **Social science**
    - **Disability advocacy**
    - **Legal and regulatory affairs**
- Diverse teams are better equipped to surface ethical blind spots and social impact concerns.

5. Engage Users in Design and Testing

- Include people from **various gender identities, age groups, ethnicities, and accessibility needs**.
- Co-design features and review decision logic with affected communities.

6. Promote Inclusive Defaults and Interfaces

- Avoid making assumptions about users' identity, language, culture, or access levels.
- Provide **customization** and **opt-out** options where appropriate.

Real-World Example

LinkedIn Job Recommendations

LinkedIn’s algorithms once unintentionally reinforced gender stereotypes—for example, suggesting higher-paying technical roles more often to male users. Upon review, LinkedIn re-engineered the

recommendation system to remove features that led to biased patterns, incorporating **fairness checks** and **user feedback loops**.

Other notable examples include:

- **Apple Card** controversy, where women reportedly received lower credit limits than men with similar financial profiles.
- **Amazon's AI recruiting tool**, which was scrapped after it learned to devalue resumes containing the word "women's."

Ethical Frameworks and Legal Implications

Governments and organizations are now pushing for **AI ethics frameworks** and **algorithmic accountability**:

- **EU AI Act**: Proposes a legal framework classifying AI systems by risk and regulating them accordingly.
- **OECD AI Principles**: Emphasize fairness, transparency, and robustness.
- **India's National Strategy for AI (NITI Aayog)**: Calls for inclusive development and bias mitigation.

Companies that fail to address bias risk:

- Violating anti-discrimination laws
- Facing public backlash
- Undermining user safety and rights

6.3.4 Global Standards and Regulations on Inclusive Design

Governments and organizations worldwide have developed standards to ensure inclusivity and ethical responsibility.

- **Key Standards:**
  - **WCAG (Web Content Accessibility Guidelines):** International rules for accessible websites.
  - **ADA (Americans with Disabilities Act):** Requires digital and physical accessibility in the U.S.
  - **ISO 9241-210:** International standard for human-centered design.
  - **EU AI Act:** Regulates transparency, safety, and fairness in AI applications.
- **Why it matters:**

  Following these standards protects organizations from legal risks, ensures broader adoption, and strengthens trust with users.

- **Example:** Government websites in many countries must comply with WCAG to ensure equal access to information for all citizens.

6.4 Future of Ecosystems

The future of design and innovation lies in **ecosystems**—networks of interconnected platforms, technologies, and stakeholders that work together to create value. Unlike standalone products, ecosystems evolve continuously, adapt to external shocks, and integrate diverse innovations.

6.4.1 Platformization and Interconnected Systems

- **Platformization:**
  Refers to shifting from standalone products to platforms that allow multiple participants (users, businesses, developers) to interact.
- **Key Features:**
  1. Multi-sided interactions (producers and consumers connect directly).
  2. Data-driven growth and personalization.
  3. Shared infrastructure for scaling.
- **Example:**
  - **Amazon:** Not just an online store, but a platform hosting third-party sellers, advertisers, and logistics providers.
  - **Apple App Store:** Connects developers with millions of iPhone users, creating a thriving app ecosystem.
- **Interconnected Systems:**
  Platforms increasingly integrate across industries—health apps syncing with insurance systems, smart homes linking to energy grids.

6.4.2 Open Innovation and Co-Creation Models

Innovation is no longer confined within company walls. Modern businesses increasingly recognize the value of **collaboration**, not only with other organizations but also with their customers. Two powerful models that support this shift are **open innovation** and **co-creation**.

These approaches move beyond traditional R&D by integrating **external expertise**, **user insight**, and **collective creativity** into the innovation process.

1. Open Innovation

Open Innovation is the practice of sourcing ideas, technologies, and capabilities from **outside the organization**, breaking the mindset that only internal teams should generate innovation.

"Not all the smart people work for us." – Henry Chesbrough (father of Open Innovation)

Key Features of Open Innovation

- Encourages **knowledge flow across organizational boundaries**
- Includes partnerships with:
  - Startups
  - Research institutes or universities
  - Freelance developers or inventors
  - Industry competitors (in pre-competitive areas)
- Focuses on **shared development**, **licensing**, **joint ventures**, or **external sourcing**

Benefits

Benefit	Description
Accelerated Innovation	Faster product development by leveraging external expertise
Cost Savings	Reduces internal R&D costs
Broader Problem Solving	Taps into diverse thinking and solutions
Access to Emerging Tech	Identifies innovations early by collaborating with startups and labs

2. Co-Creation

Co-Creation goes one step further by **actively involving customers** and end-users in the **design, development, or refinement** of products and services.

Why Co-Creation Matters

- Customers are **experts in their own needs**
- Engaging them early ensures relevance, usability, and emotional connection
- Builds a sense of **ownership and loyalty**

Forms of Co-Creation

Model	How it Works	Example
User Submissions	Users propose product ideas or features	LEGO Ideas: Fans submit and vote on new sets
Crowdsourcing	Gather input from large communities (e.g., design, feedback)	Threadless: T-shirt designs from users

Beta Testing / Pilots	Users test early versions and suggest improvements	Software beta programs like Gmail or iOS
Co-Design Workshops	Collaborative sessions with users during the design phase	Healthcare services designed with patients

3. Combined Benefits

Open innovation and co-creation are **complementary strategies** that can be used together to:

1. **Increase speed-to-market** by leveraging both internal and external capabilities
2. **Reduce the risk of failure** by validating ideas with users early
3. **Enhance product-market fit** through direct user engagement
4. **Drive social impact** by including diverse voices in innovation
5. **Strengthen brand value** by being transparent and collaborative

Real-World Examples

- **LEGO Ideas Platform**:
  Fans submit designs; those receiving 10,000+ votes are reviewed by LEGO. Some become real products, with creators credited and rewarded. This nurtures a strong fan community and consistent innovation.
- **Procter & Gamble – Connect + Develop**:
  P&G sources over 50% of innovations from outside. They partner with scientists, entrepreneurs, and institutions to co-create technologies across categories (e.g., skincare, oral hygiene).
- **Local Motors (USA)**:
  Created the first 3D-printed car through community co-creation involving engineers, designers, and car enthusiasts worldwide.
- **Unilever Foundry**:
  Partners with startups globally to solve specific brand challenges through open calls and pilot programs.

Challenges and How to Manage Them

Challenge	**Mitigation Strategy**
IP and Ownership Conflicts	Clear contracts and licensing agreements
Quality Control	Structured filtering and review processes
Overload of Ideas	Use scoring, voting, or AI to prioritize valuable inputs

Cultural Misalignment	Train internal teams to be open to external collaboration

When to Use Open Innovation and Co-Creation

Scenario	Recommended Approach
New market exploration	Open innovation
Improving an existing product	Co-creation
Rapid prototyping and testing	Co-creation with pilot users
Tapping into cutting-edge tech	Open innovation via partnerships
Engaging brand communities	Co-creation contests or platforms

6.4.3 Designing Resilient and Adaptive Ecosystems

Resilience means the ability to **withstand disruptions** (economic crises, pandemics, climate events) while continuing to function. Adaptiveness is the ability to **evolve with changing conditions**.

- **Principles of Resilient Design:**
    1. Redundancy – Backup systems and suppliers to avoid single points of failure.
    2. Flexibility – Modular design that can adapt to new technologies.
    3. Diversity – Involving multiple players and perspectives.
    4. Learning Loops – Systems that gather feedback and evolve.
- **Example:**
    - During COVID-19, digital ecosystems like Zoom, Slack, and Microsoft Teams scaled rapidly to keep global businesses running.
    - Supply chain platforms redesigned themselves to source from multiple regions instead of relying on one geography.

6.4.4 The Role of Emerging Technologies (IoT, AR/VR, Blockchain)

Emerging technologies act as the **backbone of future ecosystems**, enabling new connections and trust across industries.

- **IoT (Internet of Things):**
    - Connects devices and systems for real-time data exchange.
    - Example: Smart cities using IoT sensors for traffic management and energy savings.
- **AR/VR (Augmented & Virtual Reality):**
    - Creates immersive experiences for work, education, and entertainment.

  - Example: AR in retail lets customers “try” furniture at home before buying (IKEA Place app).
- **Blockchain:**
  - Ensures transparency, security, and decentralization in ecosystems.
  - Example: Supply chain ecosystems using blockchain to track goods from origin to delivery.
- **Integration Impact:**

  These technologies make ecosystems more **interconnected, secure, and adaptive**, supporting industries like healthcare, finance, education, and urban planning.

Knowledge Check 1

Choose the correct option:

1. Which of the following is a core feature of AI-first design?

   A) Manual customization only

   B) Static, one-size-fits-all experiences

   C) Proactive intelligence that anticipates user needs

   D) Designing products without data
2. Which principle is central to the circular economy in design?

   A) Maximizing short-term profits

   B) Take–make–dispose lifecycle

   C) Eliminating waste and keeping resources in use

   D) Focusing only on digital products
3. A smartphone designed with **modular, replaceable parts** best demonstrates which principle?

   A) Designing for repair

   B) Designing for fast disposal

   C) Platformization

   D) Blockchain integration
4. Which of the following materials is commonly considered sustainable in manufacturing?

   A) Single-use plastic

   B) Bamboo

   C) Non-recyclable Styrofoam

   D) Lead-based components
5. Ethical design emphasizes:

   A) Prioritizing profits above user well-being

B) Transparency, fairness, and accountability

C) Ignoring cultural differences for uniformity

D) Designing products with hidden algorithms

6.5 Summary

- This chapter explored how design is evolving to address the challenges and opportunities of the 21st century. It began with **AI-first products and services**, highlighting personalization, prediction, and human-AI collaboration. It then introduced **sustainability and circular design principles**, emphasizing repair, reuse, recycling, and eco-friendly materials. The section on **ethical design and inclusivity** discussed transparency, accessibility, and the importance of addressing bias in AI. Finally, the chapter examined the **future of ecosystems**, focusing on platformization, co-creation, resilience, and the role of emerging technologies such as IoT, AR/VR, and blockchain.
- Together, these elements illustrate that modern design is not only about creating products but about shaping **responsible, adaptive, and future-ready systems**.

6.6 Key Terms

1. **AI-First Design** – Approach where intelligence is built into the core of a product or service.
2. **Continuous Learning** – AI systems improving performance over time through data.
3. **Circular Economy** – Economic system where resources are reused, repaired, and recycled.
4. **Design for Repair** – Creating products that are easy to fix instead of discard.
5. **Sustainable Materials** – Resources that have minimal environmental impact (e.g., bamboo, recycled plastics).
6. **Ethical Design** – Designing with fairness, transparency, and responsibility in mind.
7. **Accessibility** – Ensuring products are usable by people with disabilities.
8. **Bias in AI** – Systematic unfairness in algorithmic outputs due to skewed data.
9. **Inclusive Design** – Designing products that can be used by diverse user groups and cultures.
10. **Platformization** – Turning products into platforms that enable interactions between multiple stakeholders.
11. **Open Innovation** – Collaborative innovation involving external contributors.
12. **Resilient Ecosystems** – Systems capable of adapting to disruption and uncertainty.
13. **IoT (Internet of Things)** – Network of interconnected devices exchanging real-time data.
14. **Blockchain** – Decentralized digital ledger enabling transparency and trust.
15. **AR/VR** – Immersive technologies enhancing digital and real-world experiences.

6.7 Descriptive Questions

1. Define AI-first design and explain how it differs from adding AI features to existing products.
2. Discuss the role of personalization, prediction, and automation in AI-first services.
3. Explain the concept of the circular economy in design with real-life examples.
4. How can design for repair, reuse, and recycling reduce environmental impact?
5. Discuss the importance of sustainable materials in manufacturing.
6. What are the key principles of ethical design? Provide practical examples.
7. How can accessibility and inclusive design improve user experience?
8. Explain how bias in AI can be addressed during product development.
9. What are global standards and regulations guiding inclusive design?
10. Analyze the role of platformization in shaping future business ecosystems.
11. Discuss open innovation and co-creation models with suitable examples.
12. What principles make ecosystems resilient and adaptive?
13. Evaluate the role of IoT, AR/VR, and blockchain in ecosystem design.
14. How do sustainability and ethics contribute to long-term business value?
15. Using Patagonia as an example, explain how sustainability and ethics can shape global ecosystems.

6.8 References

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Answers to Knowledge Check

Knowledge check 1

1. C) Proactive intelligence that anticipates user needs
2. C) Eliminating waste and keeping resources in use

3. A) Designing for repair
4. B) Bamboo
5. B)Transparency, fairness, and accountability

6.9 Case Study

Patagonia – Sustainability, Ethical Design, and Shaping the Future of Ecosystems

Introduction

Patagonia, a global outdoor clothing brand, has built its identity not only on quality products but also on its **commitment to sustainability, ethics, and ecosystem thinking**. Unlike many corporations focused purely on profit, Patagonia integrates environmental and social responsibility into its core business model.

Background

Founded in 1973, Patagonia has consistently aligned its brand with environmental activism. Its philosophy is grounded in **reducing waste, promoting circular design, ensuring ethical responsibility, and supporting global sustainability movements**. This approach has turned the company into a benchmark for responsible innovation.

Problem Statement 1: Environmental Waste from Fast Fashion

The apparel industry is one of the largest polluters globally. Most brands operate on a "fast fashion" model of short-term trends and wasteful production.

Solution: Patagonia embraced **circular design** by producing durable products, offering repair services, and promoting the reuse of clothing through its "Worn Wear" program.

MCQ:

How did Patagonia address the issue of environmental waste?

A) Increased production of cheaper clothes

B) Promoted frequent wardrobe changes

C) Adopted circular design through repair and reuse programs

D) Ignored the problem to focus on profits

Problem Statement 2: Ethical Concerns in Global Supply Chains

Many fashion brands face criticism for unfair labor practices and poor working conditions.

Solution: Patagonia committed to **ethical sourcing** and transparency. It publishes detailed reports of its supply chains and ensures suppliers meet fair labor standards.

MCQ:

What step did Patagonia take to ensure ethical responsibility?

A) Hiding details of supply chains

B) Outsourcing labor without checks

C) Publishing supply chain transparency reports

D) Reducing worker wages to cut costs

Problem Statement 3: Shaping Ecosystems Beyond the Company

Patagonia wanted to extend its impact beyond products, influencing broader **cultural and environmental ecosystems**.

Solution: Patagonia pledged **1% of sales to environmental causes**, supported activist movements, and inspired other companies to adopt sustainable practices.

MCQ:

How did Patagonia embed long-term cultural and environmental impact?

A) By investing only in advertising

B) By pledging profits to environmental causes and activism

C) By reducing its product quality

D) By focusing only on domestic markets

Conclusion

Patagonia demonstrates that **sustainability, ethical design, and ecosystem thinking** can be powerful drivers of business success. Its circular economy practices reduce waste, its transparent supply chains ensure ethics, and its activism shapes cultural ecosystems. The company proves that long-term value comes not from exploiting resources, but from **protecting people and the planet while inspiring global change**.