Lecture 2: Innovation Management

CS6215 / IT 6215

MANAGEMENT OF TECHNOLOGY AND INNOVATION (MTI)

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Innovation & Invention

- It is important to clarify the use of the term '**new**' in the context of innovation.
- If the idea seems new and different to the individual, it is an innovation.

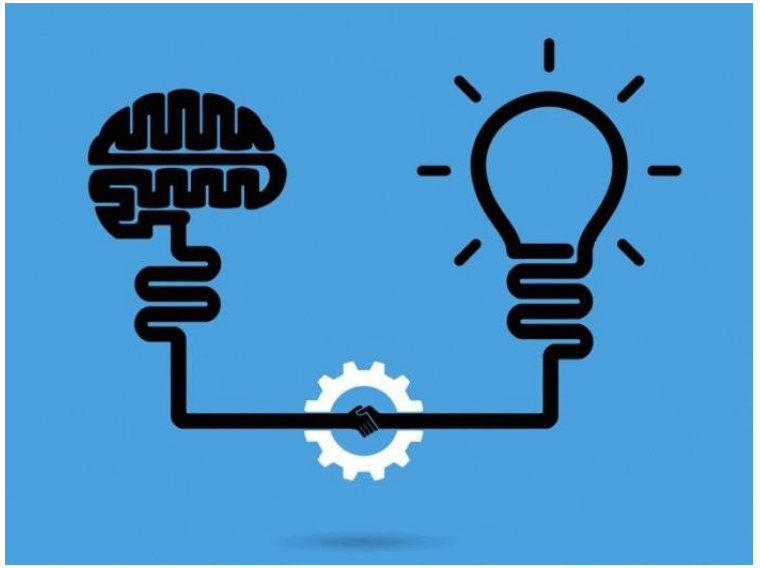
The **conception of new ideas** is the starting point for innovation.

A new idea by itself, whilst interesting, is neither an invention nor an innovation; it is merely a concept, a thought or collection of thoughts.

Innovation & Invention

Invention is the process of converting intellectual thoughts into a tangible new artefact (usually a product or process).

Innovation depends on inventions, but inventions need to be harnessed to commercial activities before they can contribute to the growth of an organization.



Popular Views of Innovation

Traditional arguments about innovation have centered on two schools of thought.

i. Social deterministic school argued that innovations were the result of a combination of external social factors and influences, such as demographic changes, economic influences and cultural changes.

The argument was that when the conditions were right, innovations would occur.

Popular Views of Innovation

ii. Individualistic school argued that innovations were the result of unique individual talents and such innovators are born. Closely linked to the individualistic theory is the important role played by serendipity; more on this later.

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Over the past 10 years, the literature (researches) on what drives innovation has tended to divide into two schools of thought:

The **market-based view** and the **resource-based view.**

Popular Views of Innovation

i. Market-based view argues that **market** conditions provide the context that facilitates or constrains the extent of firm innovating.

The key issue here, of course, is the ability of firms to recognize opportunities in the marketplace.

Cohen and Levinthal (1990) and Trott (1998) would argue that few firms have the ability to scan and search their environments effectively.

Popular Views of Innovation

ii. Resource-based view of innovation focuses on the firm and its resources, capabilities and skills.

It argues that when firms have resources that are valuable, rare and not easily copied they can achieve a sustainable competitive advantage – frequently in the form of innovative new products.

The resource-based view of innovation considers that a market-driven orientation does not provide a secure foundation for formulating innovation strategies.

MODELS OF INNOVATION

MODELS OF INNOVATION

These models are roadmaps or methodologies that companies or organizations use to identify opportunities, generate new ideas, develop them into products or services and finally bring them to the market.

They are used to understand and guide the overall innovation process within organizations.

Each model offers a unique approach to generating new ideas, developing them into products or services, and bringing them to market.

1. Linear Model

Innovation is viewed as a sequential process, starting from basic research, followed by applied research, development, and finally, diffusion or commercialization.

There are two basic variations of this model for product innovation.

i. **Technology Push**
ii. **Market Pull**

1. Linear Model

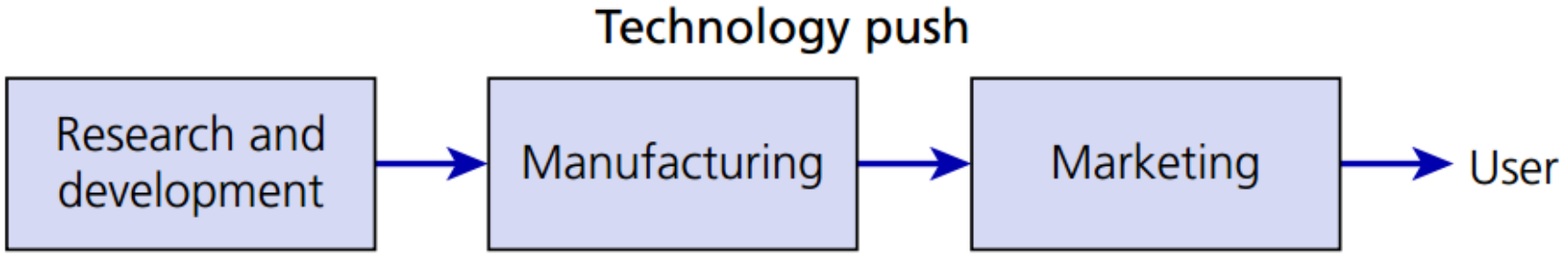
i. Technology Push is an innovation strategy where technological advancements drive the development of new products or services.

Key characteristics of technology push:

i. R&D is the primary driver of innovation.

ii. The focus is on technological advancement, rather than specific market needs.

iii. There's a higher risk of developing technologies that may not find a suitable market or fail to meet customer needs.



1. Linear Model

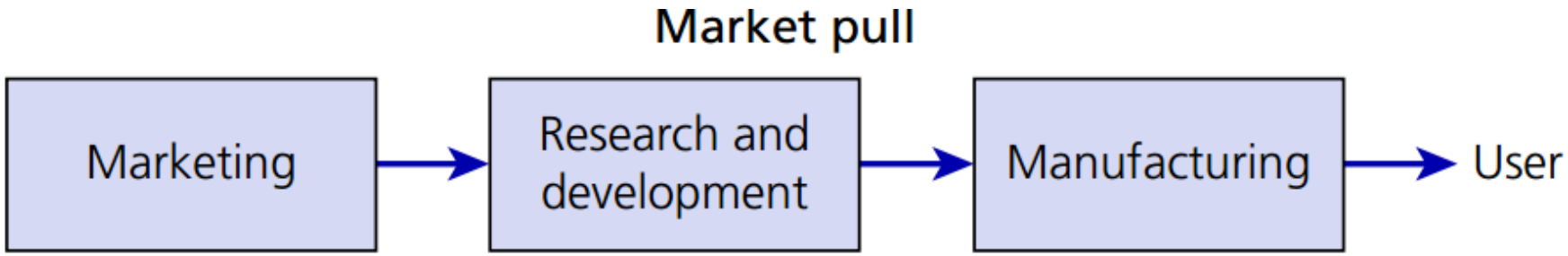
ii. Market Pull is an innovation strategy where market demand drives the development of new products or services.

Key characteristics of market pull:

i. Focuses on understanding and meeting customer needs and preferences.

ii. R&D efforts are directed towards solving specific market problems.

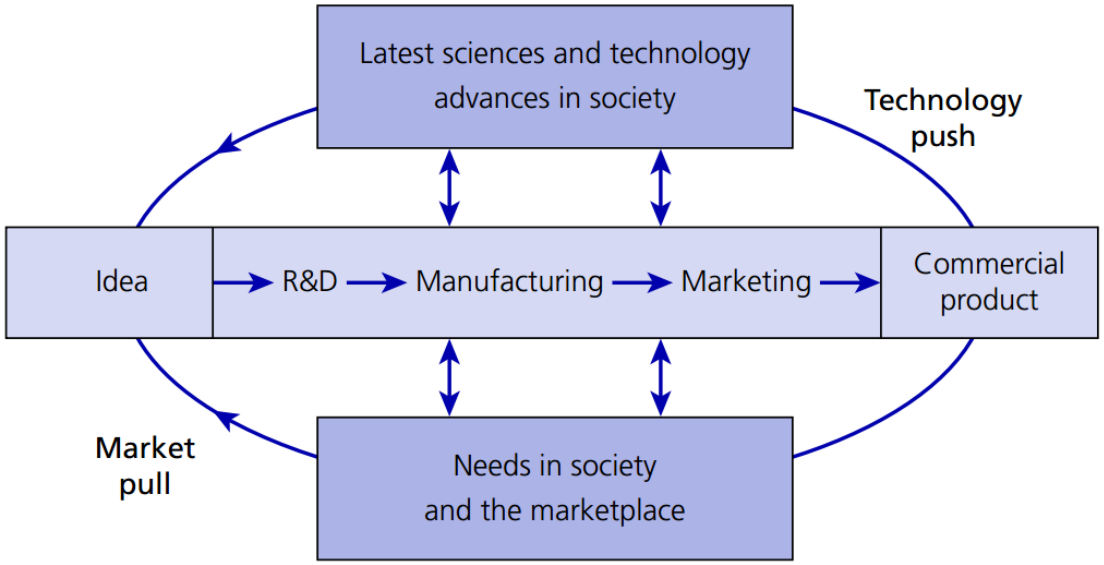
iii. Lower risk of developing technologies that may not find a market, as the market demand is already established.



2. Interactive Model

The interactive model develops links together the technology-push and market-pull models.

It emphasizes that innovations occur as the result of the interaction of the marketplace (feedback), the science base and the organization's capabilities.



3. Stage-Gate Model

This model breaks down the innovation process into distinct stages, separated by decision points (gates).

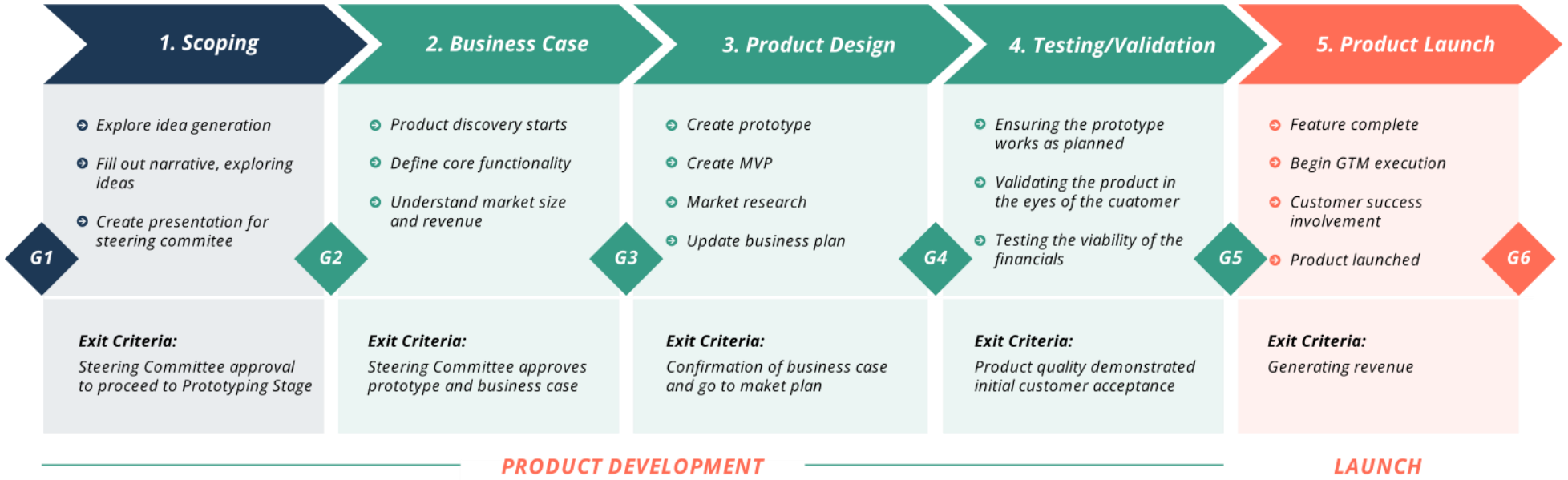
- After each phase, gatekeepers, be they senior managers or members of a steering committee or other board, conduct a gate review where they confirm that the development team has met all of the goals of the different stages of development projects. They then

1) Approve the project scope to continue into the next phase,
2) Discontinue the project, or
3) Request more work and hold another gate review.

- This structured approach reduces risk, improves resource allocation, and ensures rigorous evaluation throughout the innovation process.

Stage-Gate Model

A typical Stage-Gate model of the product development process begins with an ideation or discovery activity where new ideas are formed. If the new product concept is approved, a project enters the Stage-Gate or Phase Gate Process. Typically, there is a pre-phase, which consists of discovery followed by five phases of the Stage-Gate process:



The 6 Stages of Stage-Gate Model

1. Discovery

This initial stage involves generating new ideas and concepts. It focus on identifying potential opportunities.

2. Scoping

Once idea are formed, This stage involves defining the project’s scope, objectives and market analysis.

3. Business Case

Detailed business case is developed. Including financial projections, market analysis and risk assessment. This helps in making decisions about project viability and resource allocation.

The 6 Stages of Stage-Gate Model

4. Development

Involves actual development of the product or service. It includes design, prototyping, testing and manufacturing.

5. Testing and Validation

Before launching product or service must be tested if it meets quality standards and customer expectations.

6. Launch

The final stage involves launching the product or service into the market. This includes marketing, sales and distribution.

4. Lean Startup Model

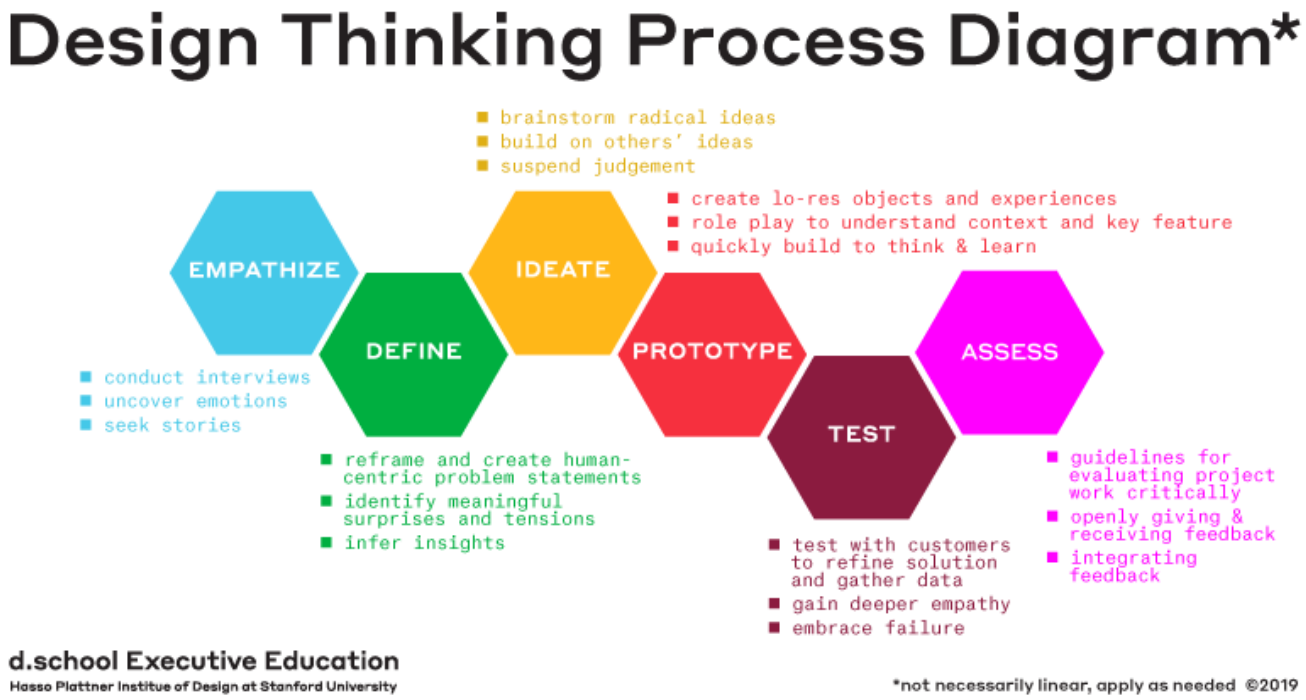
A core component of Lean Startup methodology is **the build-measure-learn feedback** loop.

The first step is figuring out the problem that needs to be solved and then developing a minimum viable product (**MVP**) and learning from customer feedback.

This approach can help to reduce the risk of failure and increase the chances of success.

5. Design Thinking Model

This model emphasizes human-centered design, with a focus on understanding user needs and developing solutions that meet those needs. This approach can help to create innovative products and services that are truly valuable to customers.



Design Thinking Process

1. Empathize

During this stage involves observing what people do and how they interact with their environment gives you clues about what they think and feel within the context of your design challenge.

2. Define

Based on your empathy research, define the core problem you want to solve. This should be a **clear**, **brief**, and **user-centered** problem statement.

Break down the problem into specific needs that your solution should address. This will help you focus your ideation efforts.

Design Thinking Process

3. Ideate

You concentrate on idea generation. We ideate in order to transition from identifying problems to creating solutions for our users. The more ideas you generate, the better your chances of finding a truly innovative solution.

Techniques like **Brainstorming**, **affinity diagram** can be used. These are business tools used to organize ideas and data.

4. Prototype: Build simple, low-fidelity prototypes of your ideas to test and refine them. Prototypes can be sketches, wireframes, mockups, or even physical models. Test your prototypes with users to gather feedback and make improvements. This iterative process allows you to refine your solution based on real-world insights.

Design Thinking Process

5. Test

- Test your final prototype with real users to see how it performs in the real world. This will help you identify any usability issues or areas for improvement.
- Actively seek feedback from users to gain valuable insights into their experience with your solution.
- Use the feedback you gather to make further improvements to your solution.

6. Blue Ocean Strategy Model

This model focuses on creating unchallenged market space, where there is no direct competition. This approach can help to achieve sustainable growth and profitability.

Examples of Successful Blue Ocean Strategies:

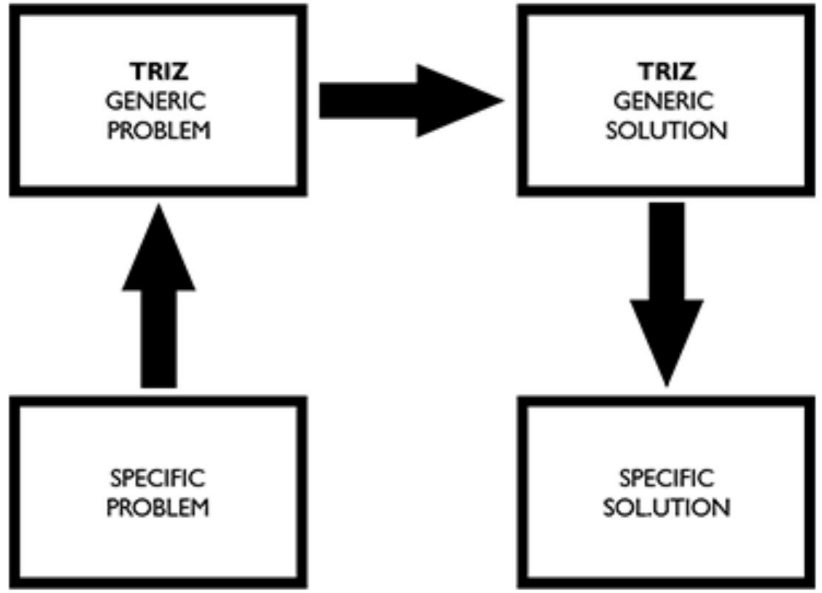
- Southwest Airlines: Created a low-cost, no-frills airline model that disrupted the traditional airline industry.
- Nintendo Wii: Revolutionized the gaming industry with a family-friendly, motion-controlled gaming console.
- Airbnb: Created a platform that connects travelers with unique accommodations, offering a more personalized and affordable alternative to traditional hotels.

7. TRIZ Model

TRIZ is the Russian acronym that stands for what we know as the Theory of Inventive Problem Solving (**TIPS**).

This model is based on the theory of inventive problem-solving, and it uses a systematic approach to identify and solve problems. This approach can help to generate creative and innovative solutions.

TRIZ is particularly suited for systematically generating ideas in the design phase of a product and for working on technical questions that arise in this context.



TYPES OF INNOVATION

TYPES (Based on Degree of Change)

1. Incremental Innovation:

Focuses on making small, continuous improvements to existing products, services, or processes.

Example: Gillette’s constant enhancements to its razors, such as adding more blades or improving lubrication strips.

2. Disruptive Innovation:

Innovations that create new markets or disrupt existing ones by offering more affordable or simpler alternatives to existing products.

Example: Netflix disrupting the traditional video rental market with its streaming service.

TYPES (Based on Degree of Change)

3. Radical Innovation:

Involves significant breakthroughs that lead to entirely new products or services and can create new markets.

Example: The invention of the smartphone, which revolutionized how people communicate and access information.

4. Architectural Innovation:

Involves reconfiguring existing technologies and components to create new products or systems.

Example: The shift from desktop computers to laptops, which involved reconfiguring existing technologies in a new form factor.

Types (Based on Focus Area)

1. **Product Innovation:** Focus on development of new products or significant improvements to existing ones. This type of innovation is often visible to consumers and can directly impact market share and revenue.
2. **Process Innovation:** Focus on implementation of new or significantly improved production or delivery methods. This can lead to increased efficiency, cost reduction, and higher quality products or services.
3. **Organizational Innovation:** Focus on changes in business practices, workplace organization, or external relations. This can include implementing new management structures, creating more efficient workflows, or fostering stronger partnerships.

Types (Based on Focus Area)

4. Social innovation:

Is the process of developing and implementing new ideas to address social problems. It involves creating solutions that are more effective, efficient, and sustainable than existing ones.

Eg.

- Providing financial services (microfinance) to low-income individuals and small businesses, particularly those excluded from traditional banking systems.
- Using technology to solve social issues, such as developing mobile health apps or using data analytics to improve public services.

Types (Based on Focus Area)

5. Marketing Innovation: Focuses on new marketing strategies that improve product promotion and customer engagement. This could involve leveraging digital marketing, adopting new branding strategies, or entering new markets.

6. Technology Innovation: Centers on the integration and development of new technologies to improve products, services, or processes. This type of innovation is crucial for maintaining a competitive edge and driving business growth.

Types (Based on Focus Area)

7. Service Innovation:

Focuses on creating new or improved services to enhance customer satisfaction and business efficiency.

Example: Amazon Prime's subscription service, offering fast shipping, streaming, and other benefits.

OTHER TYPES OF INNOVATION

1. Open Innovation:

Innovation is achieved by leveraging external ideas and collaborations, as well as internal resources. It involves sharing knowledge and technologies with external partners.

Example: Procter & Gamble's Connect + Develop program, which collaborates with external innovators to bring new products to market.

2. Closed Innovation:

Innovation is driven entirely by internal resources and capabilities, with a focus on protecting intellectual property and maintaining control over the innovation process.

Example: A company that relies solely on its internal R&D department for new product development.

OTHER TYPES OF INNOVATION

3. User-Driven Innovation

Innovation driven by user insights, feedback, and direct involvement in the development process.

Example: LEGO's user-driven innovation approach, where enthusiasts contribute ideas for new LEGO sets.

4. Sustainable Innovation

This involves creating products or services that are environmentally friendly and socially responsible.

SOURCES OF INNOVATION

SOURCES OF INNOVATION

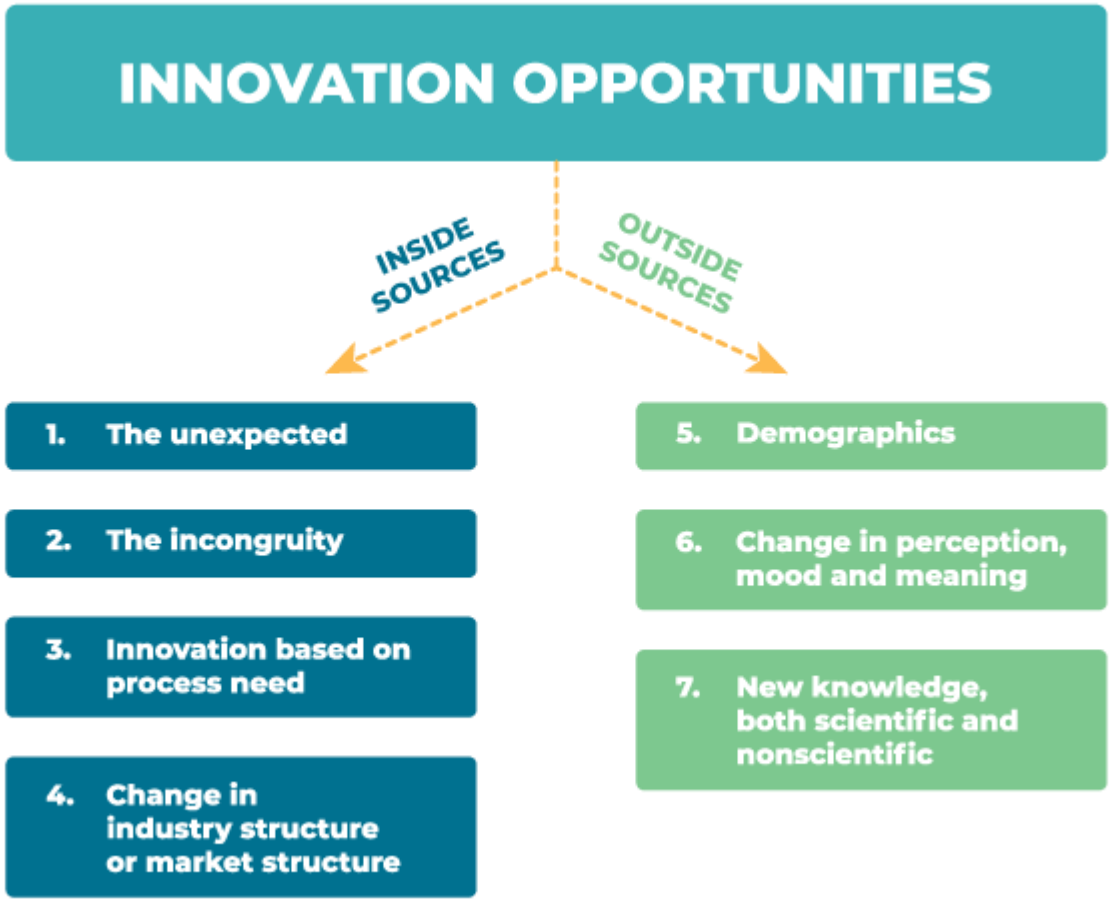
Innovation can emerge from various sources, each contributing unique perspectives and opportunities for growth.

Sources required for the firm to innovate may exist in the firm itself (internal) or from outside the firm (external).

Regardless of the source of innovation the capacity to use the opportunity is related to innovation culture of the firm and people who can think innovatively.

SOURCES OF INNOVATION

These sources are categorized as **Inside** Sources and **Outside** Sources of Innovation.



INSIDE SOURCES OF INNOVATION

1. THE UNEXPECTED

The ever-changing business world is full of surprises. Yet, not only the unexpected failures but also the unexpected success, or even events that occur in the organization can trigger innovative ideas and become the creative sources of innovation. Unexpected situations can have a very powerful influence and can inspire an organization to gain another, new, perspective on the situation.

Example: Microwave Oven

Failure: Percy Spencer at Raytheon was working on microwave-based radar equipment when he noticed a chocolate bar in his pocket had melted.

Innovation: He realized that microwaves could be used to cook food, leading to the invention of the microwave oven.

INSIDE SOURCES OF INNOVATION

2. THE INCONGRUITY

When our reality doesn’t meet our expectations, we can discover new insights and gain new perspectives. It can be a great source of innovative ideas as it compares what is and what everybody else assumes it to be.

Example

Opportunity Identification: Fred Smith recognized the incongruity between the need for quick, reliable delivery and the existing services' limitations.

Solution: He founded FedEx, focusing on overnight delivery to meet the urgent needs of businesses and individuals.

INSIDE SOURCES OF INNOVATION

3. INNOVATION BASED ON PROCESS NEEDS

The weak spots in your organization workflows, processes and systems provide practical opportunities for innovation. Innovation based on process needs is a task-focused rather than situation-focused. It improves the process that already exists, redesigns existing, old processes and reinforces the weak links.

Example:

In the early 20th century, car manufacturing was labor-intensive, slow, and costly. Henry Ford identified the need to make the production process more efficient to reduce costs and increase output. Ford recognized that the existing method of assembling cars could be significantly improved by standardizing and simplifying the process.

INSIDE SOURCES OF INNOVATION

4. CHANGES IN INDUSTRY STRUCTURE OR MARKET STRUCTURE

As the business landscape evolves, every organization has to adapt. Changes in industry shake-up businesses, yet they can inspire people to explore and create new ideas as well. Generally, industry or market structure is ever-changing and it can create great opportunities for innovation in order for organizations to adapt and adjust quickly.

Example: The Rise of Streaming Services.

Reed Hastings, CEO of **Netflix**, recognized the shift in consumer behavior towards on-demand content and the potential of streaming technology. Netflix moved from a DVD rental service to a subscription-based streaming model.

OUTSIDE SOURCES OF INNOVATION

1. DEMOGRAPHICS

Changes in demographics are defined as changes in population, size, age structure, employment, educational status and income. They are the most reliable indicators of future trends and offer diverse opportunities for innovation. Each new generation demands new and unique products and services.

Example: Nintendo recognized the growing demand for health-oriented and family-friendly entertainment. They saw an opportunity to create a gaming console that would appeal to a broader demographic, including those not typically interested in traditional gaming.

OUTSIDE SOURCES OF INNOVATION

2. CHANGES IN PERCEPTION, MOOD AND MEANING

Perception is the way people identify something.

Public perception changes due to cultural changes, globalization and technology developments. Changes in perception are based on the mood rather than on the facts.

Example

Before Airbnb, the typical perception of accommodation during travel was limited to hotels, motels, and traditional bed-and-breakfast establishments. Staying in someone's home was not seen as a viable or desirable option for most travelers.

OUTSIDE SOURCES OF INNOVATION

3. NEW KNOWLEDGE, BOTH SCIENTIFIC AND NONSCIENTIFIC

Every year new ideas are discovered and developed and a lot is added to the existing knowledge base. Knowledge has always been a source of innovation yet knowledge-based innovation has long lead time and convergence of knowledge. Technological and scientific breakthrough are the source of innovation that can’t be neglected. New knowledge can be applied in every aspect of the organization, starting from learning more about emerging trends, customer expectations, knowing how to use new technology, to improving customer service and supply chain.

OTHER POTENTIAL SOURCES OF INNOVATION

1. **Customers:** Expectations and demands of customers are increasing.
2. **Competitors and Suppliers:** New product and service ideas developed based on information received from competitors can produce highly productive and profitable results for the firm.
3. **Universities and Research Canters:** New ideas, technologies or knowledge as a result of scientific studies conducted in universities can be a source of new products and services to be developed by firms.

CASE STUDY: APPLE

Questions

1. The return on investment delivered by Apple has fallen considerably. Explain why.
2. Steve Jobs' impact on Apple is without question. Surely a company of over 100,000 employees is not reliant on one person? How did his death affect Apple?
3. Apple's fortunes have ebbed and flowed over the past 40 years. The past few have seen growth; in your assessment will the next few years see decline?
4. Explain how Jonathan Ive may be responsible for much of Apple's past success and future fortune

CASE STUDY: APPLE

Questions

5. Discuss whether Apple has shunned open innovation and adopted a very closed innovation model.

6. Samsung seems to be nibbling away at Apple's market share. Has Apple mismanaged its outsourcing?

7. How might Apple be able to capture value from the rise of Apple as a lifestyle brand?

8. Discuss how, on the one hand, Apple seems to very good at disruptive innovation, yet it is also accused

of copying others.

9. How do you solve the Apple stores problem?

Until Next Session