2023-2024

Innovation and entrepreneurship

Nadia GAHLAM

Unit 1: Innovation

1. Definition

Innovation is considered as both the process and outcome of creating or inventing something new and valuable that produces broader effects in the economy and technological advances (Edwards-Schachter, 2018).

Freeman (1974, p. 22) defined innovation related to invention as intrinsic to technological change: "an invention is an idea, a sketch, or a model for a new or improved device, product, process, or system."

Freeman (1974, p. 22) maintains, "an innovation in the economic sense is accomplished only with the first commercial transaction."

Porter (1990) defined innovation as "a new way of doing things (termed invention by some authors) that is commercialized" (p. 780).

For Peter Drucker (1984), "*innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced. Entrepreneurs need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation, and they need to know and apply the principles of successful innovation*." Drucker add a link between entrepreneurship and innovation as a new business opportunity.

An innovation "is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (Oslo Manual, 2005, p. 46)

2. Typologie of innovation

The most popular interpretating of 'innovation' was by Joseph Schumpeter (1934). He takes it as what he named "new combinations" and he distinguish the innovation from the invention. According to Schumpeter, the innovation is a function that carried out within the economic sphere with a commercial intention. Invention is not systematically followed up by commercialization. It is the process which allow to generate new ideas and put them into commercial practice.

These new combinations can give us the five types of innovation according to Schumpeter:

- Innovation of product or service
- Innovation of market
- Innovation of organization's method
- Innovation of materials' source
- Innovation of production's process

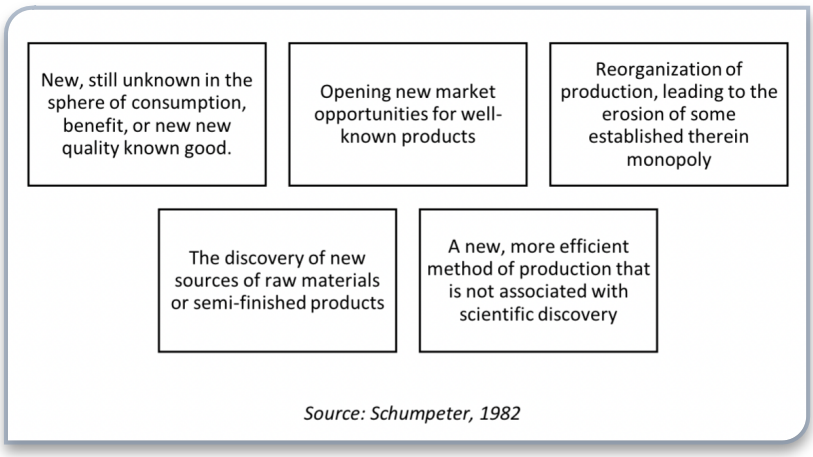

Fig 1: Schumpeter's typologies of innovation

Today we can speak about many typologies of innovation according to:

2.1.The field of the innovation:

- **Product innovation:** creating or improving good or services. It may be developing new features, enhancing performance, or introducing new offerings.
  Iphone *- it combined a phone, ipod and a computer in one product. It transforms how people communicate, access information and use technology in their daily live.*
  3D printing *– it transforms manufacturing processes of many products.*
  Tesla electric cars *– it offers a hight performance electric cars offering longer driving ranges and advanced autonomous driving features.*

- **Service innovation:** improving the quality, efficiency or delivery of services. E.g: including digital technologies.
  Uber *– using app for connecting drivers and customers.*
  Airbnb *– it revolutionized the hospitality sector by allowing individuals to rent out their homes to travelers.*
  Netflix – *it shifted from a DVD rental service to a subscription-based streaming platform.*

- **Organizational innovation:** reshaping the organizational structure or process to improve productivity and foster creativity and collaboration.
  Google's 20% time *– employees spend 20% of their worktime on projects of their choice in order to foster innovation and pursue their ideas.*

- **Marketing innovation:** involving innovative approaches to promoting goods and services like branding strategies, advertising campaigns...
  Instagram *– a platform for brands products.*
  SmartBuyGlasses *– The brand uses virtual reality to try and choose glasses.*

- **Process innovation:** improving the way tasks or activities to increase efficiency, reduce costs… It can be by including new technologies in the fabrication process, optimizing supply chain logistics…
  Ford vehicle manufacturing- *Henry Ford's invention of the world's first moving assembly line.*

- **Business model innovation:** rethinking the ways a company creates, delivers and captures value.
  Uber, Air B&B, Alibaba.

- **Technological innovation:** using new technologies to create new solutions according to science advancements.
  Smartphones, electric vehicles, artificial intelligence, IoT (Internet of Thinks)…

- **Open innovation:** a collaborative approach that involves sourcing ideas, technologies or solutions from external partners (customers, universities, institutions…).

- **Social innovation:** addressing societal challenges and improving the well-being of communities. It aims to solve social problems.

- **Sustainable innovation:** aims to develop products, processes, or business models that may solve both social and environmental problems.

2.2.The nature of the innovation

- **Radical (disruptive) innovation:** introducing new and groundbreaking ideas or technologies that can disrupt existing markets or business models. It creates new industries.

Fig 2: Example of a radical innovation

Radical innovation" refers to the type of innovation that involves significant and disruptive changes to products, services, processes, or business models. It often represents a deviation from established norms and can transform an industry or market. Radical innovation introduces groundbreaking and novel concepts, technologies and

approaches, can have far-reaching impact, can disrupt existing markets or business models, and can involve higher risks than incremental innovation. It creates new industries.
Iphone is an exemple of a disruptive innovation. Airplans, cars…

- **Incremental innovation:** It refers to a type of innovation involving small, incremental improvements, enhancements, or changes to existing products, services, processes, or business models. Unlike radical innovation, which represents a radical departure from the status quo, incremental innovation builds on existing knowledge, practice, and technology. The emphasis is on iterative changes to improve and optimize existing solutions rather than introducing entirely new concepts.

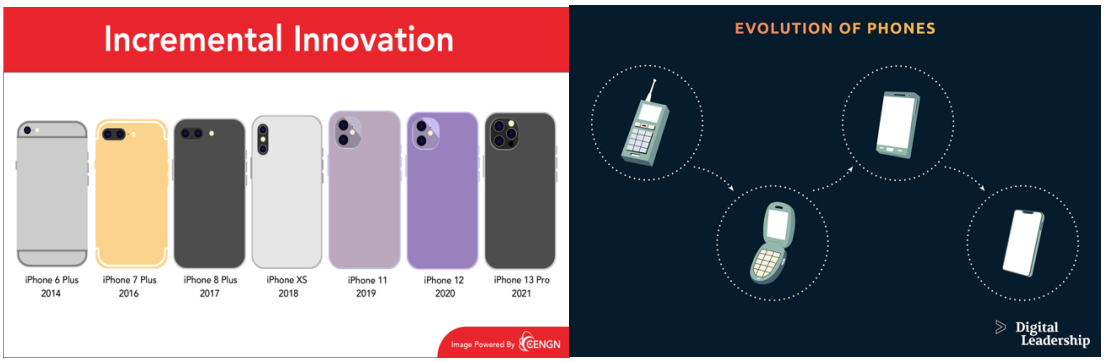

Fig 3: Example of incremental innovation

Incremental innovations are usually low risk and are often employed to improve the performance, quality and efficiency of products and services while maintaining continuity with established products.
Iphone 14 is an example of an incremental innovation comparing with the Iphone 12 for e.g.

Successful organizations mix these innovation types to stay competitive.

3. Innovation models

3.1.Technology push / Market pull (1st & 2nd generation)

This model is strongly influenced by Schumpeter.
It is a concept where innovation is primarily driven by advancements and capabilities in technology. In this model, technological developments or breakthroughs are starting point for creating new products, services, or solutions. The emphasis is on pushing technology into the market to see how it can be applied.

TECHNOLOGY PUSH MODEL

MARKET PULL MODEL

Fig 4: The linear model

Introduced in the 60's, in the 'Market Pull' innovation model, innovation is mainly driven by identified market needs and demands. In this model, the starting point for innovation is a thorough understanding of what customers or the market require, and then efforts are made to develop products, services, or solutions that meet those needs. The goal is to extract innovation from the market rather than forcing technology into it.

This innovation processes are linear models.

While the Technology Push model is valuable for driving innovation, it's not without its challenges. Without a clear understanding of market needs and demands, there is a risk of developing technology that may not find a practical application or market fit. Including market-driven approaches in this model is often beneficial to ensure that the technology meets real-world needs. So, we need a coupling model of innovation.

3.2. Coupling model (3rd generation)

The coupling model is offering an interaction between different elements. A link appears here for the first time between R&D and Market. This innovation model involves coupling a technological and market factor.

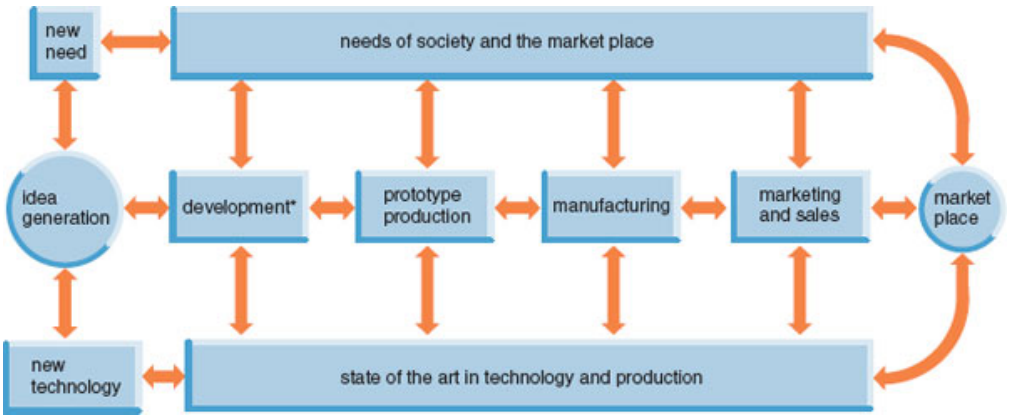

Fig 5: Rothwell's coupling model (1992)

Rothwell's coupling model makes technology in front of market because a real interaction between both is important and in the different steps of the innovation' process.

3.3. Integrated model (4th generation)

Introduced in the 80's by Rosenberg, this model involves different departments of the organization. It provides a flexible framework for organizations and acknowledges that innovation is not confined to one department, but it requires a coordinated efforts in the organization.

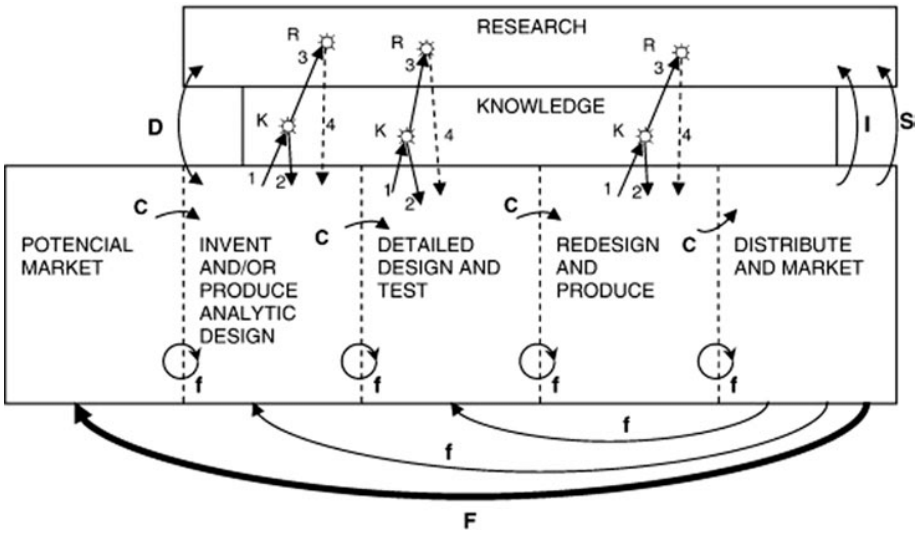

Fig 5: Rosenberg's integrated model (1985)

This model was introduced while US manufacturing companies underwent a big competition from Japanese compagnies (Rothwell, 1994). It was largely inspired by the Toyota innovation model.

3.4. Network model (5th generation)

Also known as the Networked Innovation Model or Systems Integration and Networking (SIN), this innovation model aims to consolidate externals and internals factors. It emphasizes the importance of collaboration and information exchange in the ecosystem. So, the innovation isn't a result of internal R&D but it involves a network of participants like suppliers, partners, and competitors.

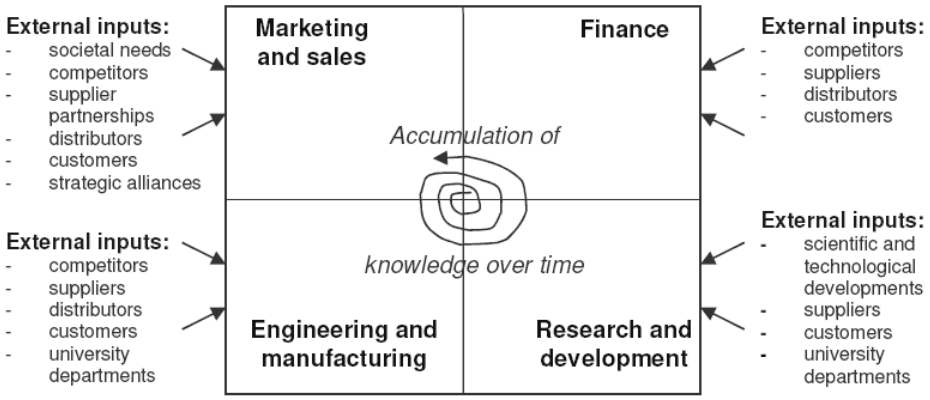

Fig 6: A network model innovation (Trott, 2005)

3.5. Open innovation (6th generation)

In the same field, Henry Chesbrough (2003) suggests that innovation rests on internal and external flows of information. According to him, in closed innovation R&D performs internally and guarantee the legal protection of innovation, but it reduces business opportunities. Open Innovation focuses on the identification of new opportunities as a result of knowledge coming from outside the company (Bénézech, 2012).

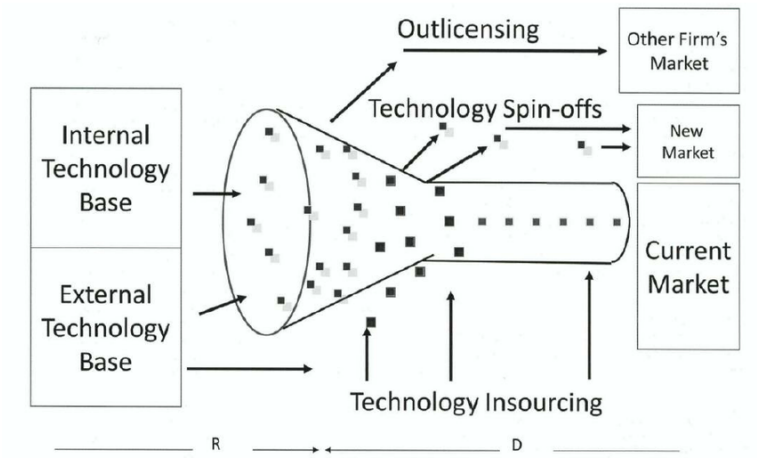

Fig 7: The open innovation (Chesbrough, 2012)