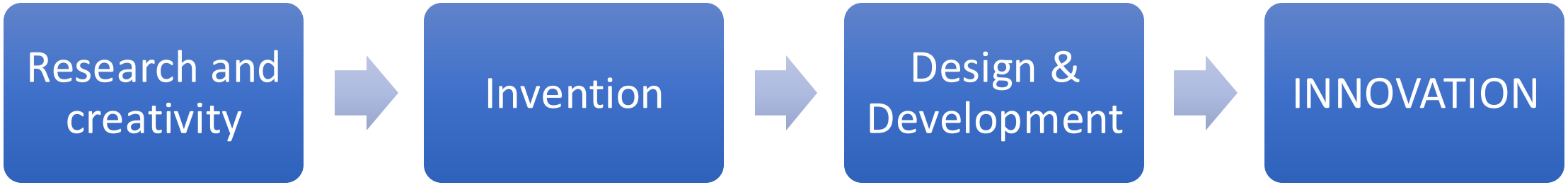
Basic concepts in innovation

The simplistic linear model of innovation

To start → a very simple model of innovation: the 'linear model'

- It means that research and creativity lead to innovation and wealth creation in a 'straight line' and this is a one-way process.



Issues in the innovation chain

Research & Creativity	Invention	Innovation & Technological Change	Market
Autonomous Theory	IP Protection, Formal: Patent Registered Design Trademark Copyright	Innovations: Product Pricing Service Proliferation	Passive Consumers
Combinatorial Theory	IP Protection, Informal: Complexity Lead-Time Confidentiality Secrecy	Innovations: in Process in Organisation in Business Model in Supply Chain in Marketing	Active Consumers
	Open Innovation	Innovations: Incremental Radical Architectural	

THE MAIN LINKS IN THE LINEAR MODEL
What Is Innovation?

A huge variety of definitions but within economists →

A very concise and popular definition: 'The successful exploitation of new ideas'.

This captures two of the essential features of innovation.

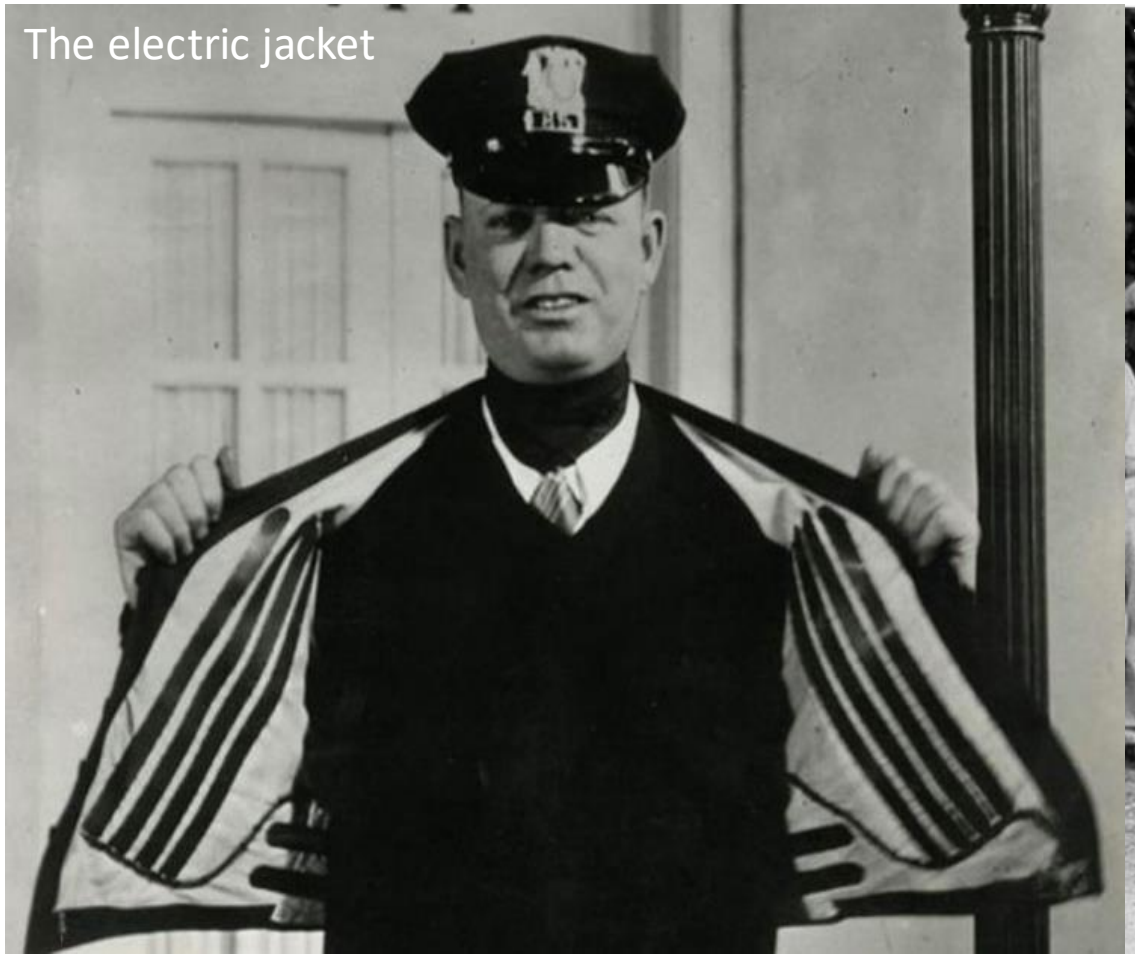
1. It is not just about the generation of new ideas; it is about their commercial exploitation.
2. This definition also helps us to understand the clear distinction made in economics between innovation and invention.

THE MAIN LINKS IN THE LINEAR MODEL

How Does Innovation Differ from Invention?

- Invention is about the generation of new ideas, whether by research or other forms of creativity.
- Inventions are the culmination of research activity and are ideas, sketches or models for a new product or process, that may often be patented. However, invention stops short of commercial use or exploitation. It is when the new idea is used in the market that we have innovation.
- Innovation is the commercial application of invention.
- Many inventions never turn into innovations, and for those that do, there can be a long and complex chain of events between invention and innovation – rather more complex than our simple model suggests.

Inventions that never became innovations



What is an imitation?

The word imitation often crops up in the discussion of invention.

If company B copies a successful innovation by company A, then we call that imitation.

The time lag between innovation and imitation can be very variable, depending as it does on patent rights, lead-times and so on.

THE MAIN LINKS IN THE LINEAR MODEL
What Is Creativity? How Does it Differ from Invention?

‘Creativity’ and ‘invention’ are sometimes used interchangeably.

But ‘creativity’ is the process or activity, and ‘invention’ is the result.

Creativity is a long and sometimes painful process.

Some would say it is better described as an ‘activity’ than a ‘process’ because there are no rules for creativity.

By contrast, an invention can be described on paper – and indeed will have to be if the inventor wishes to patent it.

The Schumpeterian approach

According to Schumpeter, an innovation fed a process of *creative destruction* by causing continuous disturbances in the economic system.

He assigned the key role in economic growth to the **disruptive activity of entrepreneurs.**

The source of these disturbances was innovation generated, as Schumpeter said:

> "competition from the new commodity, the new technology, the new source of supply, the new type of organisation, competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives".

There is recent empirical evidence, to suggest that the extent of creative destruction is linked to the rate of growth.

THE MAIN LINKS IN THE LINEAR MODEL
The concept of **creative destruction**

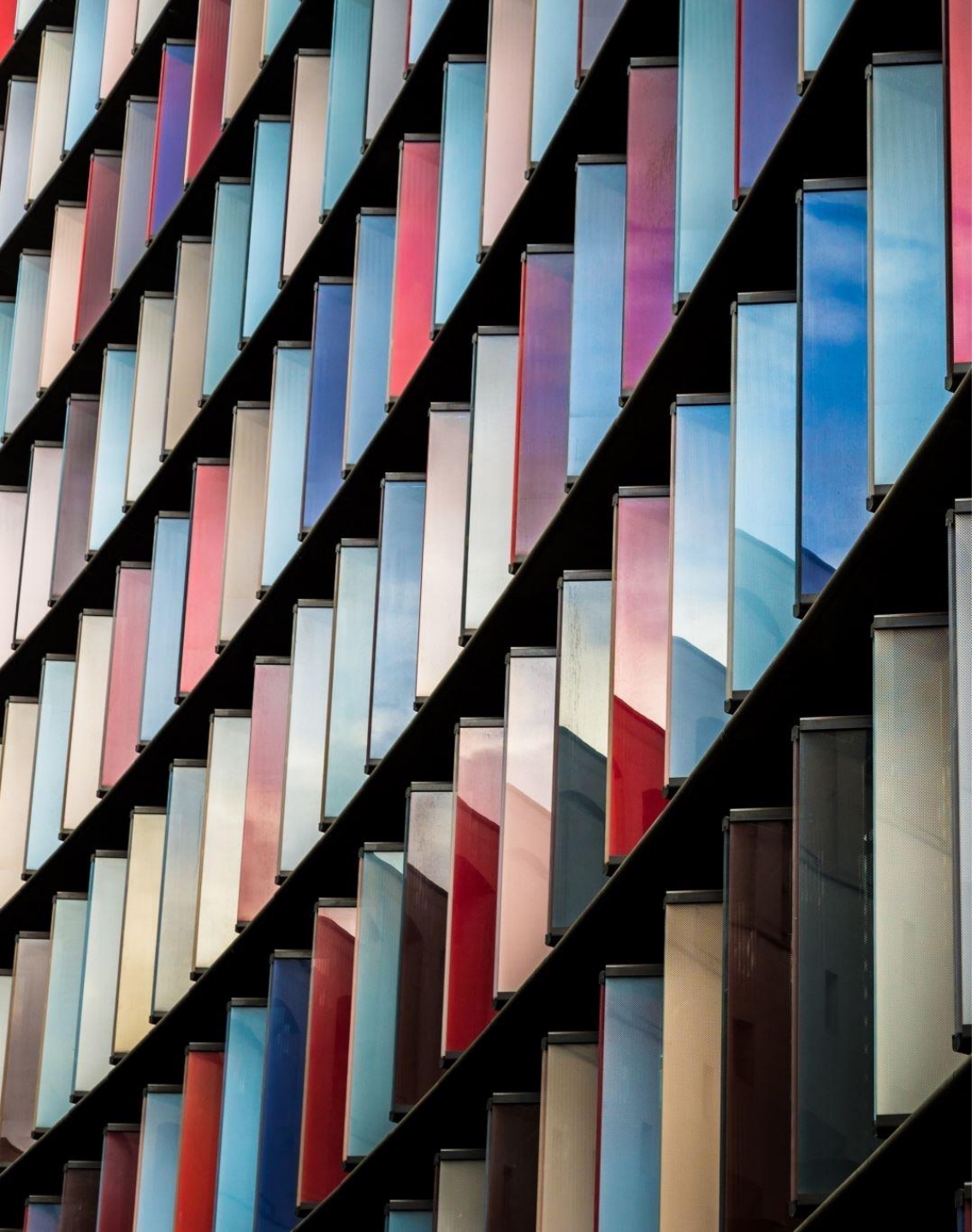
- The concept of creative destruction is one of the most important in the economics of innovation.
- The innovator creates something – competitive advantage, probably and possibly wealth – but in doing so destroys something else, often the competitive position of a rival firm.
- So innovation creates and destroys at the same time, but with luck the value of creation will exceed the value of destruction.

THE MAIN LINKS IN THE LINEAR MODEL

Research and Development (R&D)

Research and development are two different activities → in an industrial context most corporate spending on R&D should properly be described as D rather than R.

- **Basic research** produces new scientific knowledge, hypotheses and theories and these are expressed in research papers, while inventive work drawing on this basic research produces patentable inventions.
- **Development work** takes this stock of knowledge and patentable inventions as its raw materials and develops blueprints, specifications and samples for new and improved products and processes



THE MAIN LINKS IN THE LINEAR MODEL
Design or Development?

Design according to the Design Council (1995) and experts:

- **Michael Wolff:** Design is **vision, process, and result**.
- **John Harvey Jones:** 'Design adds the extra dimension to any product.'
- **Bernsen (1987):** In a global market, design differentiates products through **functionality, aesthetics, communication, and brand identity**.
- Design is a key channel for **commercial innovation**, alongside technological development.

Is there a Difference between Innovation and Technological Change?

Innovation is a wider concept than technological change → technological change is a sub-set of innovation.

All technological changes are innovations, but not all innovations involve technological change. Some innovations may involve new packaging and new design but not any new technology.

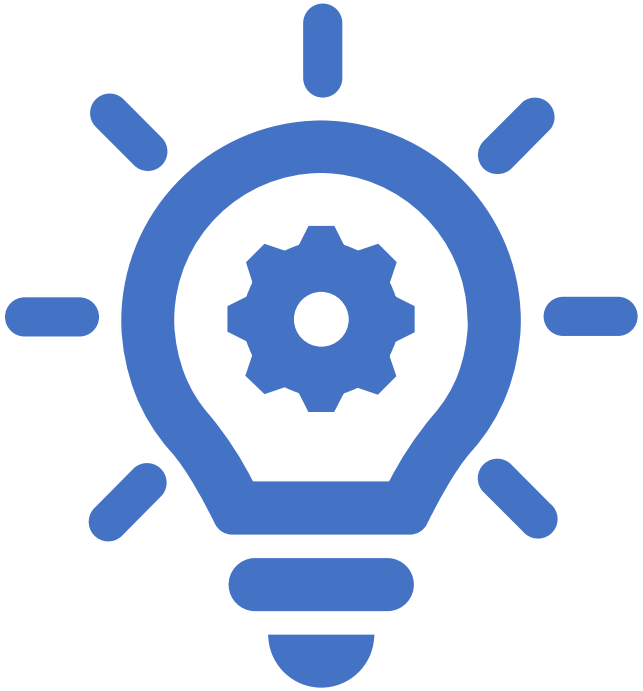
- The various generations of iPad are a good example of this. As innovations, these were very successful. But this was not because they embodied new technology →The iPad just used existing technology, but packaged and designed the product in a most imaginative way.

DIFFERENT FORMS OF INNOVATION

Schumpeter (1954), the most influential writer about innovation, demonstrated that innovation could take many forms:

- introducing new commodities;
- qualitatively better versions of existing ones;
- finding new markets;
- new methods of production and distribution;
- new sources of production for existing commodities;
- introducing new forms of economic organisation.

Following on from this, economics has developed quite a detailed terminology to describe different types of innovation.



Product or Process Innovation?

Some have suggested that the distinction between product and process innovation is not a useful or important one because the same thing can be a product innovation to one person and a process innovation to another.

BUT

Not everyone agrees with that.

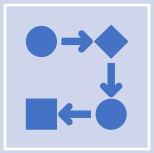
The distinction between product and process innovation is a very important one.

- Eg. A new improved computer may be a product innovation to the company selling it, but it is a process innovation to the operations manager using the new computer to run a more efficient production line.

Product or Process Innovation?

A pure process innovation simply changes the way in which a product is made, without changing the product itself (except perhaps the price at which it will be sold).

A pure product innovation, on the other hand, creates a new or improved product for sale without any change in the production process – except that more inputs (labour, machine time and materials) may be required.



Many if not most innovations embody some of each. Often a new and improved process will lead to incidental improvements in the product, and even more frequently a new product will require some innovations in the production process.

Different Types of Product Innovation: *THE PRODUCT INNOVATION*

We describe a product in terms of a list of features or characteristics.

We can then compare different varieties of the same product in terms of their different scores on all these characteristics.

- This allows to make a distinction between product innovations that:
  - affect only one characteristic,
  - product innovations that affect several characteristics,
  - product innovations that introduce just one new characteristic
  - and product innovations that introduce so many new characteristics → the innovation of a completely new product.

Different Types of Product Innovation: *THE SERVICE INNOVATION*

Different firms may have competitive distinction by innovations in the service they offer rather than innovations in the product per se.

This growth in the service element is partly a consequence of increasing specialism and division of labour.

Services have features and characteristics too, and can be analysed in the same way as product innovations and we can analyse combined product/service innovations in the characteristics approach.

Division of Labor: Adam Smith emphasized the importance of the division of labor in promoting economic efficiency. He argued that when workers specialize in specific tasks, it leads to increased productivity. This specialization can be seen as a form of innovation, as it allows individuals to focus on improving and refining their skills in a particular area.

Different Types of Product Innovation: *THE PRODUCT PROLIFERATION*

A rather special type of product innovation is known in economics as product **proliferation**.

This is the idea that we fill up a product space with lots of slightly different versions of the same product.

The innovation here is not so much the innovation in any one product, which may be unexceptional, but the strategy of filling the space.

Different Types of Product Innovation: *THE PRODUCT PROLIFERATION*

Different Types of Product Innovation: *THE PRODUCT PROLIFERATION*

Why do companies do it?

There are two reasons:

- companies find it is profitable to segment markets;
- Offering a menu of slightly different varieties of the same basic product at different prices is an efficient way to segment markets.

In economics, we would say that this is price discrimination by product differentiation. The potentially anti-competitive reason is that companies seek to fill up the product space so as to make it hard for others to enter.

Different Types of Product Innovation: *THE BRAND PROLIFERATION vs EXTENSION*

Brand proliferation is the opposite of brand extension.

- In **brand extension**, new items are added using an existing brand name and several products are offered under the same brand name

- in **brand proliferation**, more items are added to the product line with different brand names. In other words, the firm has several brands in the same product line or product category. It means that the list of independent brands increases.

Different Types of Product Innovation: *THE PRODUCT EXTENSION*

The launch of a new item involves initial costs and risks related to failure, but if a brand is already known and enjoys the trust of the consumer, it is much easier to get noticed by exploiting the reputation of the parent brand.

Risk: the failure of a new product, or its inconsistency with the company's core business

What Is Product Differentiation?

- Product differentiation is the key aspect(s) distinguishing one company's products or services from its competition. Successful product differentiation leads to brand loyalty and an increase in sales.
- A product differentiation strategy involves identifying and communicating the unique qualities of a product or company while highlighting the distinct differences between that product or company and its competitors. Product differentiation goes hand in hand with developing a strong value proposition so that a product or service is attractive to a target market or audience.
- If successful, product differentiation can create a competitive advantage for the product's seller and ultimately build brand awareness.

Product Proliferation, is sometimes a strategy to avoid Imitation of Differentiated-Product

Dominant incumbents can use product proliferation to occupy a region of the product space and deter rivals from imitating their products.

- In part, this is because product proliferation makes the introduction of close substitutes comparatively less profitable;
- In part, it is because the strategy conveys a threat of retaliation to potential imitators. Yet this threat is only credible if the proliferator has high costs of exit from the occupied region of space.

Product proliferation is the strategy whereby a firm extends its product offer in a market or submarket so as to saturate the product space and minimize unmet demand.

This is a common strategy in industries characterized by non-price competition, where large incumbents often use it to maintain an oligopolistic market structure

Proliferation and diversification

Diversification : entering new categories

Proliferation: extending the firm's offerings in specific categories without altering the firm's scope.

Product proliferation occurs when organizations market many variations of the same products. This can be done through different colour combinations, product sizes and different product uses. This produces diversity for the firm as it is able to capture its sizable portion of the market.

Different Types of Product Innovation: *THE INNOVATIVE PRICING*

What is innovative pricing?

It is a new way of charging for a product or service.

Eg. It is commonly used by mobile phone operators.

Innovative pricing does not mean any change to the product or service, but simply means a different way of charging for the service.

Nevertheless, innovative pricing is an innovation in terms of what the customer faces in the marketplace and not an innovation in the way something is produced.

It is closer to product innovation than process innovation.

Different Types of Product Innovation: *THE INNOVATIVE PRICING*

Why do companies use innovative pricing?

- because it offers a subtle way of achieving more effective price discrimination;
- for the same competitive reasons that companies make other innovations --> it may allow the innovator to under-cut a rival in a price-sensitive market segment without cutting prices across the board.