



EPFL

- Taxonomies – from value generation to value distribution
- Innovation spillovers

Stratégies de Spécialisation Intelligente

Typology based on value generation

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Product innovation

Introduction of a good or service that is new or significantly improved (functional changes)

Higher diversity of products/services – better matching to various segments of consumers – uncovered needs are met

Process innovation

Implementation of a new or significantly improved production or delivery method (including organizational changes)

It can decrease unit production or delivery costs and enable the production of new (or significant improvements of) products or services

(Business or Social) Model innovation

Introduction of a new way to organize an activity or of an entirely new activity – combining new product & process and new user experiments

It offers a new model for economic activity – which is likely to generate value for consumers, to find new way to reach out to customers and to secure business (social) returns

System innovation

Introduction of systemic changes involving aligned incentives, technologies and services to generate system level transformations e.g. sustainable mobility in city X

It generates conditions for systemic transformations according to a socially desirable goal

Effects on welfare

The effect of innovation on economic welfare will be discussed in Chapter 3

Learning to analyse innovation value – involving not only value creation but also:
*destruction (winners and losers)
*externalities (environmental and more)

Typology based on value generation - cont

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Product innovation includes differentiation

Within an existing class of products, products with different characteristics and prices are generated
Market for clothes washing products: liquid powders, concentrates and non con., biological or non bio.

Vertically differentiated – at a given price – all buyers prefer one rather than the other variant
Vertical differentiation involves new higher quality but also new lower quality which implies a lower price (public transport – 1st, 2nd and 3rd class)

Horizontally differentiated – at a given price, one variant is preferred by some consumers, and the other variant is preferred by some others

The introduction of new horizontally or vertically differentiated products is defined as horizontal product innovation and vertical product innovation respectively as improving economic welfare
Vertically differentiated can improve welfare greatly (increase the number of consumers),
Horizontally differentiated improves at margin

The case of breakfast cereals: 80 brands by 1973 – the goal is saturating the market to deter competitive entry

Product proliferation – segments market – deters entry by rivals



An example of a great vertical differentiation

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What is low cost?

Cheap is not a good definition

It involves an extreme simplification of product or services.

Compared to the mainstream offer – richer and more complex – the low cost process eliminates all secondary attributes to focus on the main value

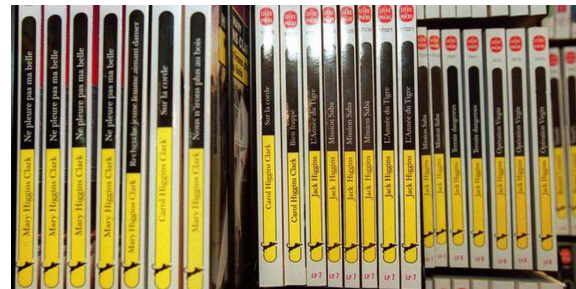
Some low cost innovations meet limits which are hard to overcome – low cost flight: a great innovation but are the prices right? If they are too low (because of pollution and emission), they need to be increased but then it is no longer low cost
A difficult trade off between two good things

Some low cost innovations are just great!

They increase access while not producing any negative effects (but they can be disruptive)

A great entrepreneurial drive!

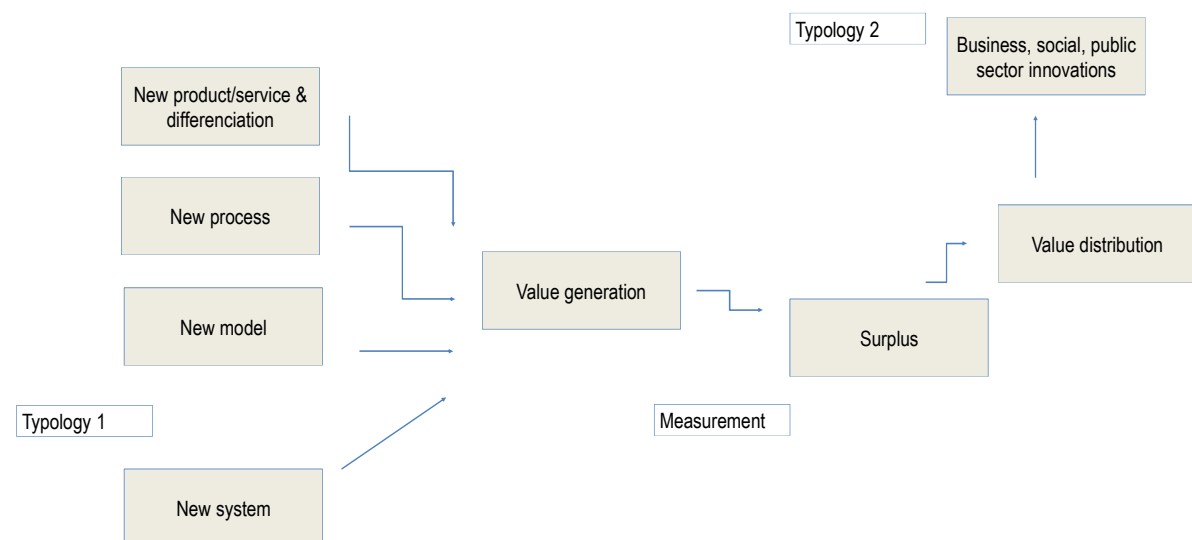
Against an elitist attitude regarding culture which was dominating in certain social groups
Produces an incredible democratization



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From value generation to value distribution

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Typology based on value distribution

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I innovate to make a profit

Business innovation = a significant fraction of the value is expected to be captured by the private innovator

I innovate to serve a social needs

Social innovation = either by choice or by necessity most value of the innovation will go to society

I coordinate and incentivize private and social innovations in technologies, institutions and social practices to generate systemic changes

Public sector innovation

A **business innovation** generates value which is translated into consumer surplus and profit

Social innovation generates value which is translated into « social impact » i.e. no profit (then what mechanism, institution is funding the innovation)?

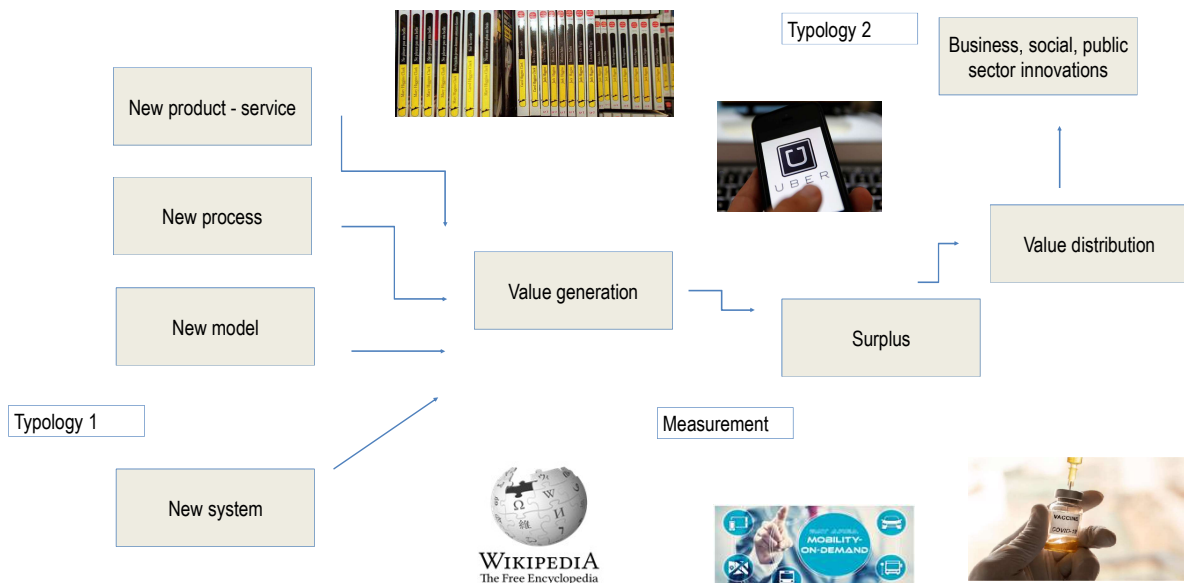
Public sector innovation generates value which is shared by all stakeholders (Uber, Imagine Cargo, an E-bike start up and the users)



Social innovation can be generated through an individual initiative (a social entrepreneur) and can target a granular goal
Public sector innovation is initiated by the public sector and targets systemic transformations

From value generation to value distribution

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Poll - Can you guess Britain's most famous innovation?

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Product/service innovation

Grand Theft Auto
Bank of England

Process innovation

Steam engine
Spinning jenny
London Bridge

Model innovation

Copyright
Tesco
Football

And the winner is....

Is a new book an innovation?

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- Yes it is!
 - A new idea, materialized under the form of a new product (a book) and adopted by the market
 - It can be as expensive to create new film as a new drug and this involves activities similar to R&D – creative thought, experimentation, selection, adoption in the economy
 - It can have a significant market impact
 - « *Despite the huge financial impact and considerable sales of the work of J.K. Rowling, this work has not been considered (in economics) to be an innovation. This is undesirable* » (P.Stoneman)
- But
 - Most innovations we analyze involve changes which are functional in nature
 - A new book, a new film, a new video-game involve changes which are non-functional
- Soft innovation
 - Innovation in goods and services that primarily impacts upon **sensory perception**, aesthetic appeal or intellectual appeal rather than functional performance

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Soft innovation

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Innovations which are non functional in nature in both culture and other industries
= soft innovation

Innovation in goods and services that primarily impacts upon sensory perception, aesthetic appeal or intellectual appeal rather than functional performance
New content generation

Aesthetic innovations in industry the output of which is not aesthetic but functional
Products in these industries may have many non functional elements
Marketing innovation

Innovations in product that are not considered functional in nature but offer aesthetic appeal – a new aesthetic product – book, music, film, fashion, art, videogame

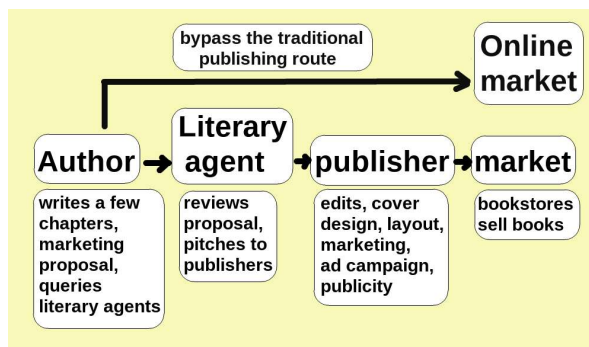
Video games
Advertising market
Design industry
Book market
Film industry
Music industry
Architecture market
Broadcasting
Performing arts
Art market

Changes of an aesthetic/intellectual nature are considered significant if they are economically important (they are innovation) – market share as a proxy
Harry Potter is an innovation – the NZZ of today is not (relative to the NZZ of yesterday)

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Soft innovations have found new climbing holds – a cost story

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Digitizations minimized all costs (of creating, duplicating and distributing soft innovations)

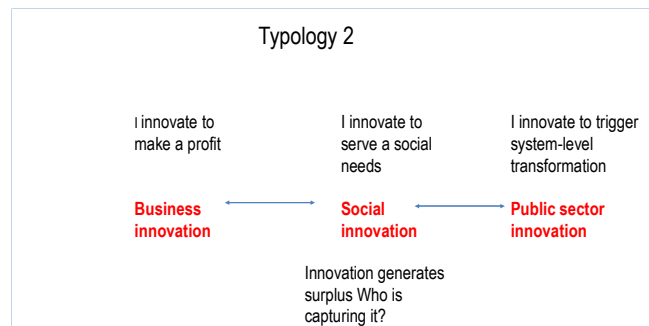
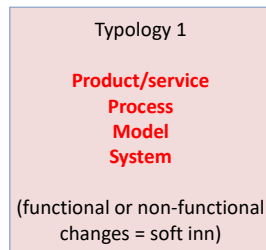
As all costs have declined, huge expansion of these creative outputs

An explosion of movies, TV programs, on-line videos, music production, new books

but the fixed cost of imagining a good story and writing it remains

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Innovation creates value (typology 1) and the value is captured by private innovator or goes to society or both (typology 2)



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- Taxonomies – from value generation to value distribution
- **Innovation spillovers**

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Positive spillovers

- Spillovers – the benefits of an innovation spill-over and goes beyond the innovative firm to benefit to the rest of society (which was not contributing to the innovation and don't pay for these benefits)
- A part of the value of the considered innovation is not fully incorporated in market prices
- This is an important concept for business innovation since it is an unpriced value which is not intentional

- Innovation generates 'larger' improvements than what is valued through market prices

- Innovative product will generally be sold at a price that does not fully capture all of the superiority of the new product relative to what was available before
- A new product/service can be created at some upfront cost (paid once) but its gains appear substantial and durable (can change life for ever – refrigerator, zoom, transport innovation)

Market spillovers

- Innovation as source of inspiration, new ideas for others

- Communication spillovers: knowledge of innovation will tend to spread, reducing any desire of the entrepreneur to prevent such spread

Knowledge spillovers

- Innovation as enabling further innovations and new applications

- The innovation improves conditions and quality of life (e.g. computer)

Intertemporal spillovers

Market spillovers

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- Innovative product will generally be sold at a price that does not fully capture all of the superiority of the new product relative to what was available before
- A new product/service can be created at some upfront cost (paid once) but its gains appear substantial and durable (can change life for ever – refrigerator, zoom, transport innovation)
- Zoom or Teams, etc.. have transformed life
 - in university: travels; access to top scholars for committees; international meetings; improve teaching for some segments of students. Just for Professors' travel, it saves: 3.750.000... and EPFL pays annually.....??



Ambivalence of spillovers:
a good and a bad thing

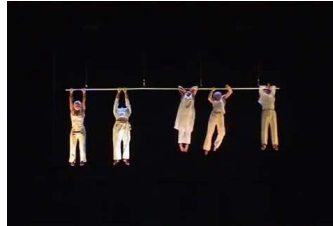
Knowledge spillovers

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- Product innovation – patents are imperfect



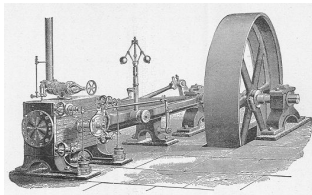
- Creative industries – no IP and weak 'secrets': Choreographer Yoann Bourgeois suspected of multiple plagiarism



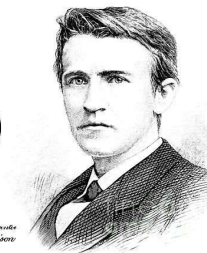
Remedies – secrecy but doesn't work in many contexts; intellectual property right system but imperfect (many issues); lead time – the firm focuses on instantaneous appropriability – norm-based intellectual property

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Intertemporal spillovers



T. A. Edison
Electric-Lamp
Patented Jan. 27, 1880.
No. 223,898.



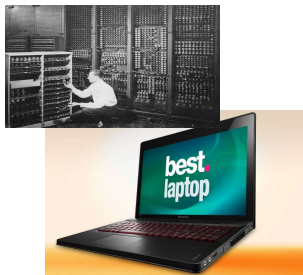
General purpose technologies are tracing the whole economy towards new modes of invention, production, consumption and delivering eventually high productivity gains

Whole periods of tech progress, innovation and economic growth appear to be driven by a few key technologies

Harry Pot- or Compu- ter?

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- Soft innovations can generate some spillovers as they suggest ideas for other works, but these are inherently fairly limited
- Should we revise our assessment about Harry Potter *versus* Steam Engine? « *What makes tech innovation potentially generate large spillovers is the essentially unlimited scope of potential applications* » A.Jaffe



Advantages for
computer:
Vertical improvement
and horizontal
propagation

