

THE ECONOMICS OF INNOVATION

Lecture 1:

Introduction to the Economics of Innovation

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TEACHING STAFF

Module Convenor:

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LEARNING OBJECTIVE

“To help students understand the economic analysis of innovation, and why innovation is so important to companies and to the economy. Economics of Innovation develops some theoretical building blocks for the analysis of innovation AND looks at empirical questions about innovation.”

There is **no main** text for the course.
Optional readings will be introduced gradually.

ASSESSMENT:

- 75% EXAMINATION
- 25% Group Coursework Essay
 - each group will comprise exactly 2 to 3 students

Examination

- 1½ hour examination in December 2015.
- The exam paper will have two sections (A and B) each containing three questions. You are required to answer:
 - TWO questions - one from section A and one from section B.
 - Section A will include three questions which relate mainly to lecture topics 1-5.
 - Section B will include three questions which relate mainly to lecture topics 6-10.

Coursework

- 2500 words
- Sign up for a group of your choice on Moodle by the Friday, 16 October 2015.
- Deadline to submit is 2pm on Friday, 27 November 2015.
- Read the Project Brief for details (attached to module outline)

Lecture 1

Introduction to the Economics of Innovation

Lecture Outline

1. Why should we study the economics of innovation?
2. The merit of the history of economic thought
3. Defining innovation

INNOVATION

definition
success
transformation
business
positioning
idea
goal
improvement
concept
sociology
marketing
creative
strategy
project
design
economics
growth



What is innovation?

Innovations transform (and hopefully improve)
'things' and 'ways of doing things'...
CHEAPER AND/OR BETTER



Innovation is key to **growth, development** and **competitiveness**

“Much of the rise in **living standards** is due to innovation —this has been the case since the Industrial Revolution. Today, innovative performance is a crucial factor in determining **competitiveness** and national **progress**. Moreover, innovation is important to help address **global challenges**, such as climate change and sustainable development. ” OECD, 2007.

Available at: <http://www.oecd.org/science/inno/39374789.pdf>

Why care about innovation?

Knowledge and innovation are the source for
Economic Growth and Competitiveness

Innovation is often directly connected to **Living Standards**

Let's look at what famous economists have said about innovation

“the invention of all those machines by which labour is so much facilitated and abridged seems to have been originally owing to the division of labour”

(A. Smith 1776, p11)



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

‘... All good things that exist are
the fruits of originality’

(Mill, 1859, p.20)

“Hitherto it is questionable if all the
mechanical inventions yet made have
lightened the day's toil of any human
being. They have enabled a greater
population to live the same life of
drudgery and imprisonment, and an
increased number of manufacturers and
others to make fortunes.”

(Mill, 1848, p.751)



- Adam Smith
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- Karl Marx
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- Joseph Schumpeter
- Robert Solow

“The bourgeoisie cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society.”

(Marx and Engels, 1848)



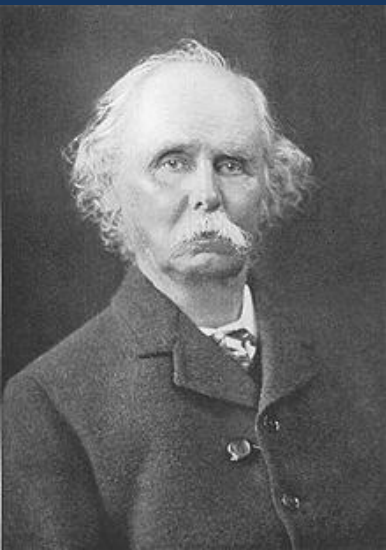
- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“The **firm** cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society.”

- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“In every stage of his progress he is destined to contrive and invent, to engage in new undertakings; and when these are accomplished to enter with fresh energy upon others.”

(Marshall, 1920, p.90)



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“Invention is the mother
of necessity.”

(Veblen, 1914, p.315)



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“(the) process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of creative destruction is the essential fact about capitalism.”

(Schumpeter, 1954, p.83)



- Adam Smith
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- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“We see computers everywhere except in the productivity statistics”

(Solow, 1987, p. 36)



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow
- Paul David
- Richard Nelson

“Path dependency and the economics of QWERTY”

- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow
- Paul David
- Richard Nelson



“Evolutionary Theory of Economic Change ”

(Nelson and Winter, 1982)



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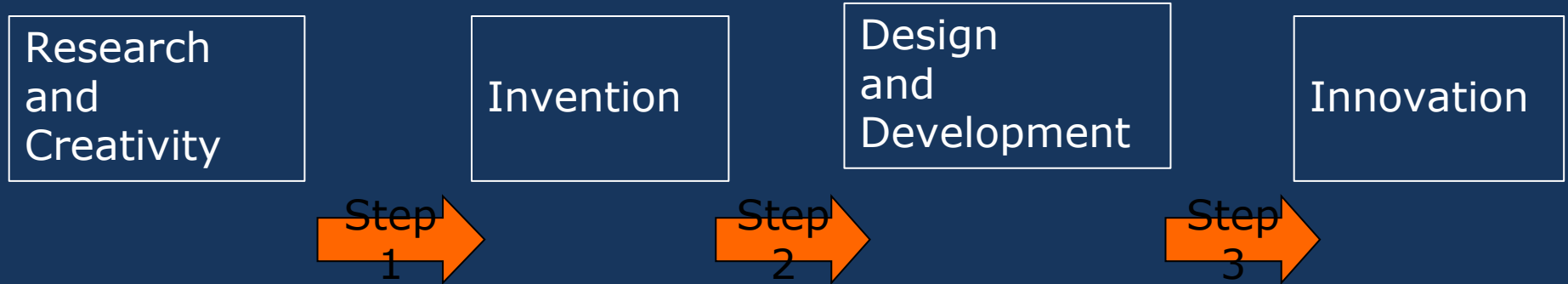
5 themes that dominated the innovation studies

- ✓ Innovation and Wealth Creation
- ✓ Innovation and Competitiveness
- ✓ Innovation and Sustainability
- ✓ Innovation, unexpected side effects and paradoxical non-effects
- ✓ Who is the innovator?

Defining innovation (more formally)

- ✓ The Linear Model of Innovation (I)
- ✓ Innovation as the 'successful' exploitation of new ideas'' (II)

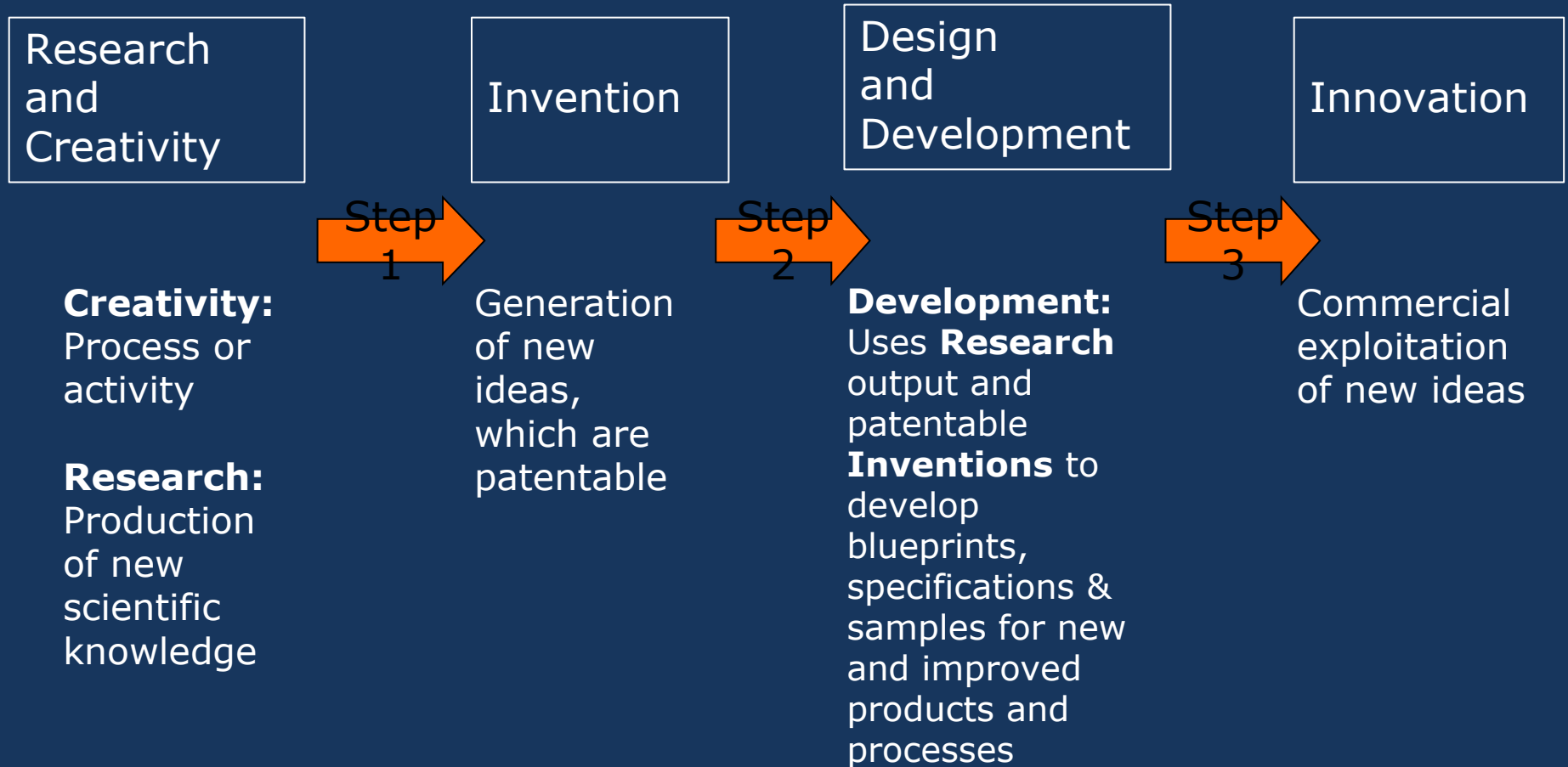
The Linear Model of Innovation



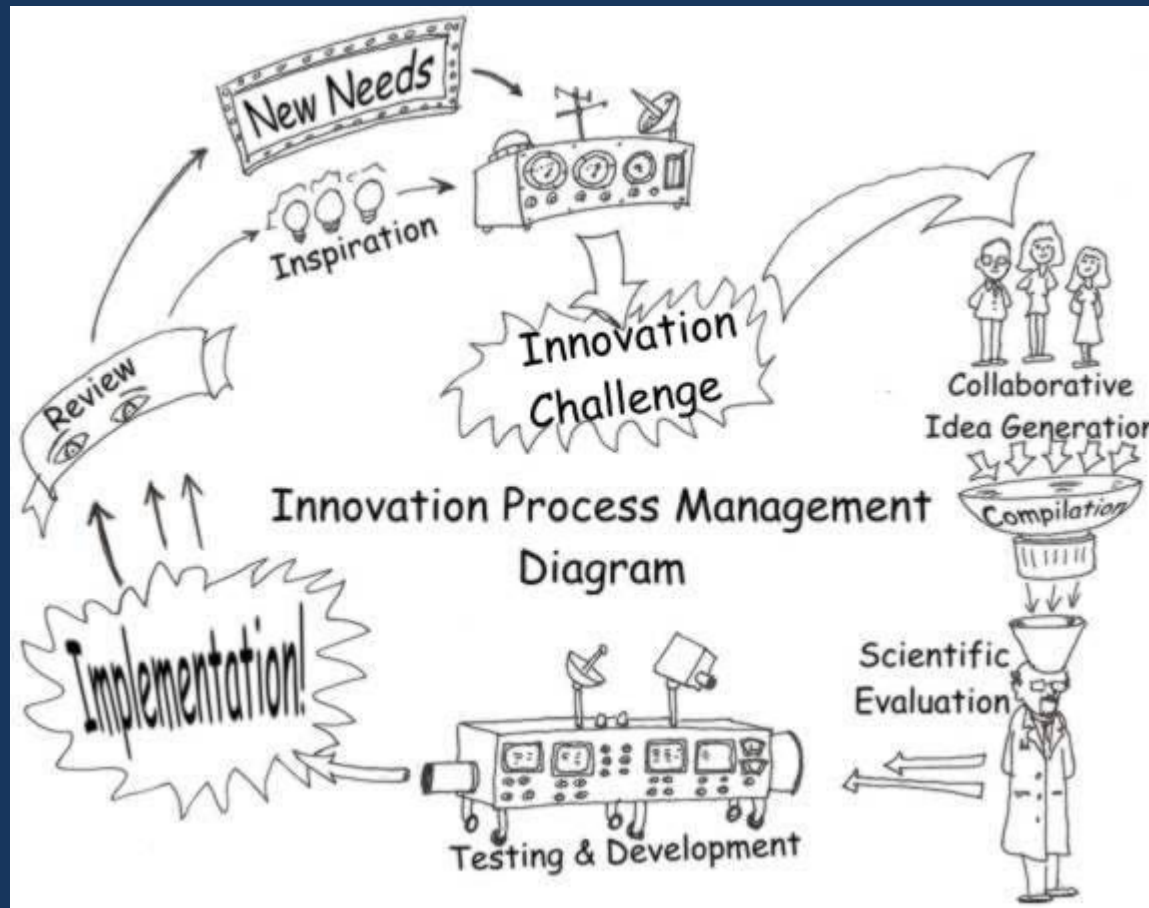
Linear means:

- A line of interconnections from Research/Creativity to Invention to Design/Development to Innovation
- Simplified model; No feedback loops

The Linear Model of Innovation



Innovation is no longer seen as a linear process



Innovation is a non-linear and complex process

Innovation as the 'successful' exploitation of new ideas



SOURCE: Lewis Branscomb and Philip Auerwald, *Between Invention and Innovation: An Analysis of Early-Stage Technology Development*, NIST GCR 02-841, Gaithersburg, MD: National Institute of Standards and Technology, 2002.

Innovation='successful exploitation' of new ideas

Innovation doesn't necessarily entail creating something new. It's not the same as invention.

"Too often the obsession is with inventing something totally unique rather than extracting value from the creative ... " (William Buxton, 2005)

Innovation usually involves a **fresh perspective** on something that already exists.

'I invented nothing new. I simply assembled the discoveries of other men behind whom were centuries of work...Progress happens when all the factors that make for it are ready and then it is inevitable.' **Henry Ford**

Innovation and Technological Change

Do all innovations involve technological change?

Is every technological change also an innovation?

Lecture 1: Introduction to the Economics of Innovation

Summary

1. Why should we study the economics of innovation
2. The merit of the history of economic thought
3. Defining innovation
 - 3.1. The Linear Model of Innovation (I)
 - 3.2. Innovation as the "successful exploitation of new ideas" (III)

**Oh... and
one more
thing**