



Mahidol University  
Faculty of Science

# Innovation R&D

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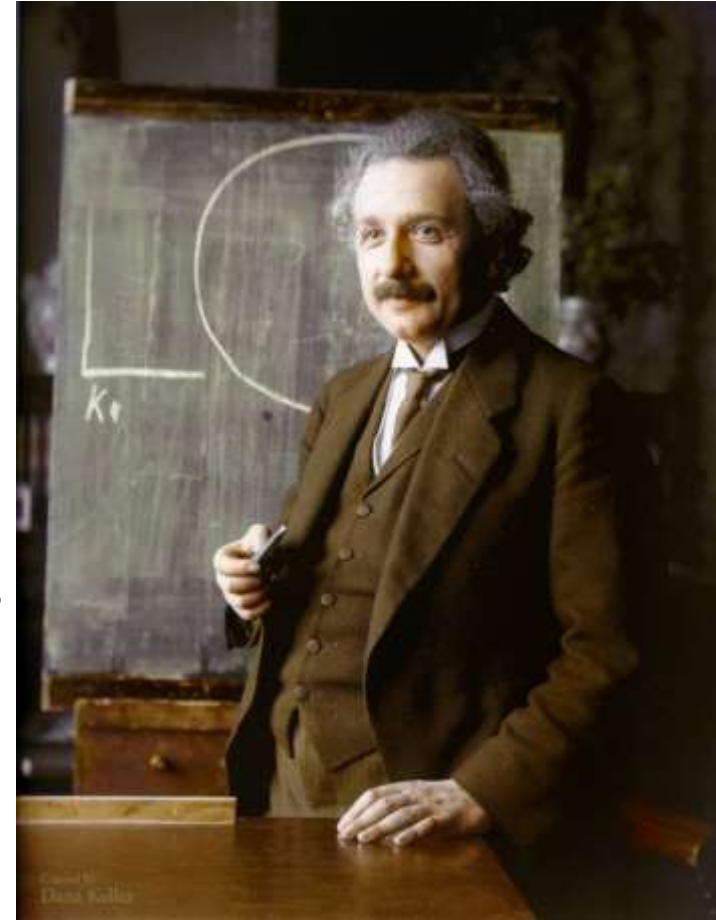


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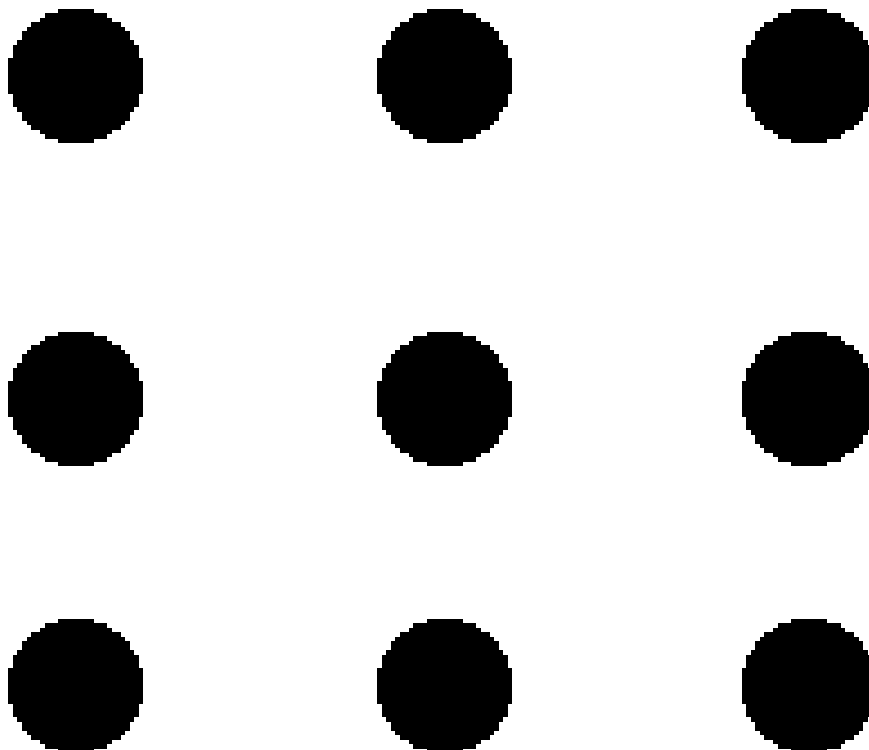


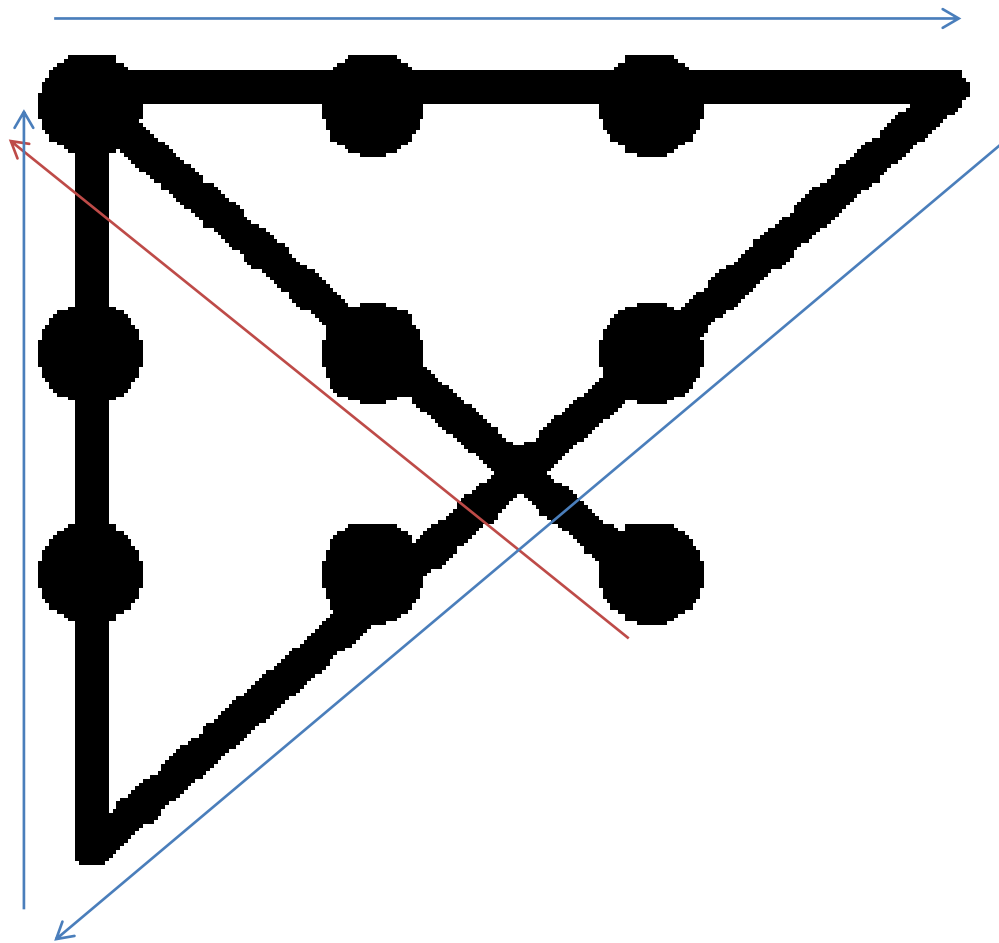
*“Problems cannot be solved by thinking within the framework within which the problems were created”*

Albert Einstein

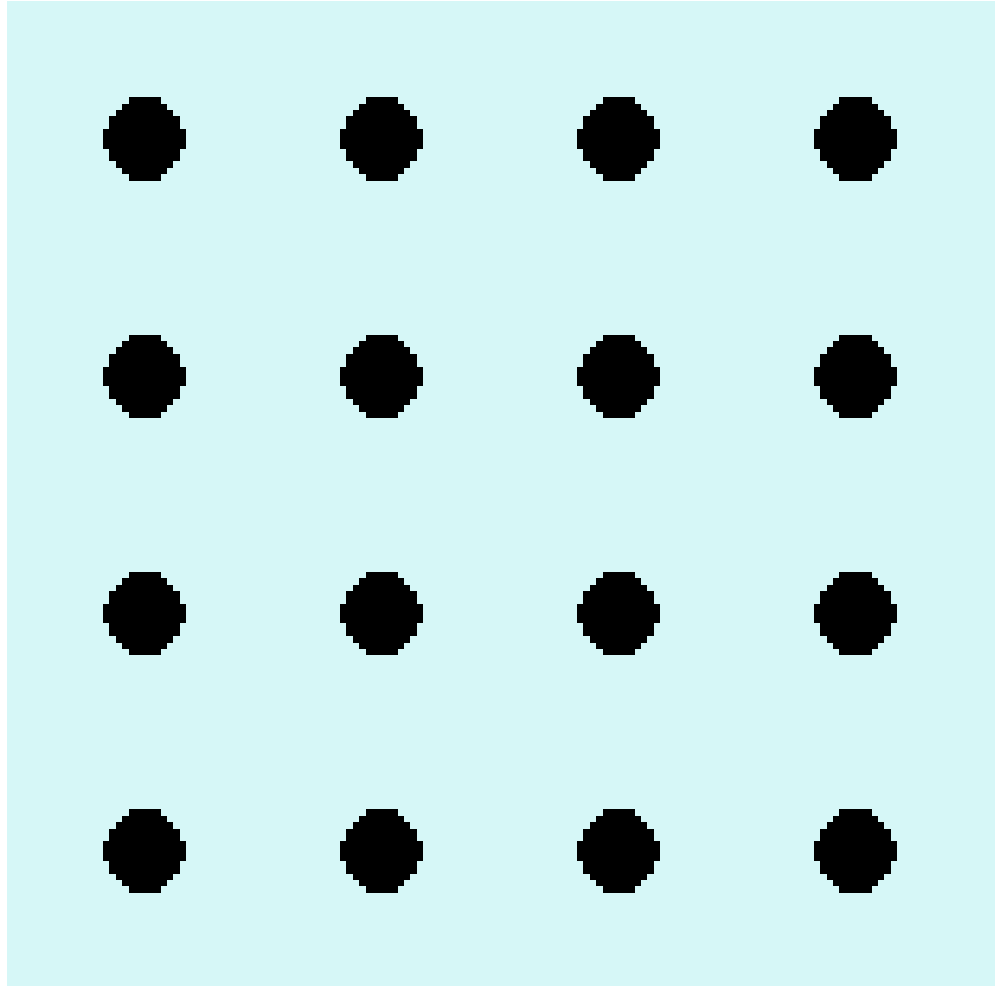


**Think outside the box**

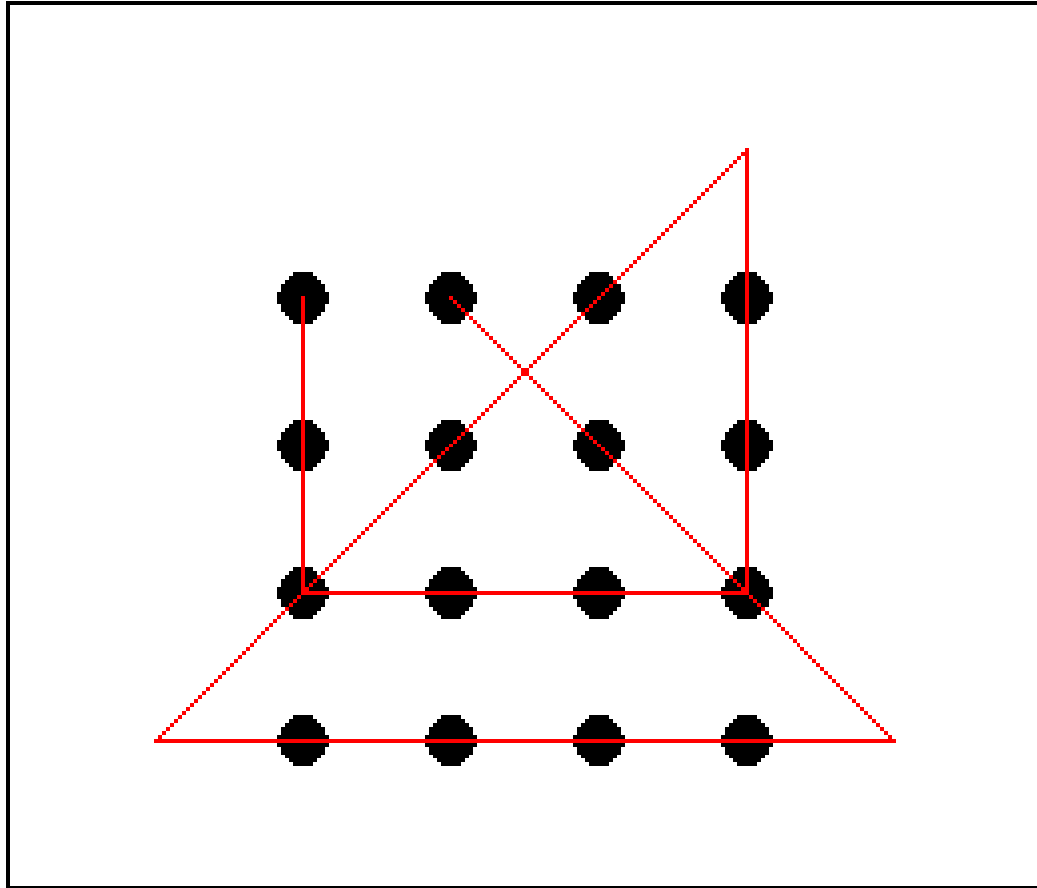




16 dots, 6 lines



<http://www.sciencenewsforkids.org/articles/20041027/PuzzleZone.asp>



# What is innovation?

- **Innovation** is the process and outcome of creating something new, which is also of value.
- Innovation involves the **whole process** from opportunity identification, ideation or invention to development, prototyping, production marketing and sales, while entrepreneurship only needs to involve commercialization (Schumpeter).



# What is innovation?

- Today it is said to involve the **capacity to quickly adapt** by adopting new innovations (products, processes, strategies, organization, etc)
- Also, traditionally the focus has been on new products or processes, but recently new **business models** have come into focus, i.e. the way a firm delivers value and secures profits.

# What is innovation?

- Schumpeter argued that innovation comes about through new combinations made by an entrepreneur, resulting in
  - a new product,
  - a new process,
  - opening of new market,
  - new way of organizing the business
  - new sources of supply

Innovation =  
Creativity +  
Commercialization

# Dimensions of innovation

There are several types of innovation

- Process, product/service, strategy,

which can vary in degree of newness:

- Incremental to radical,

and impact:

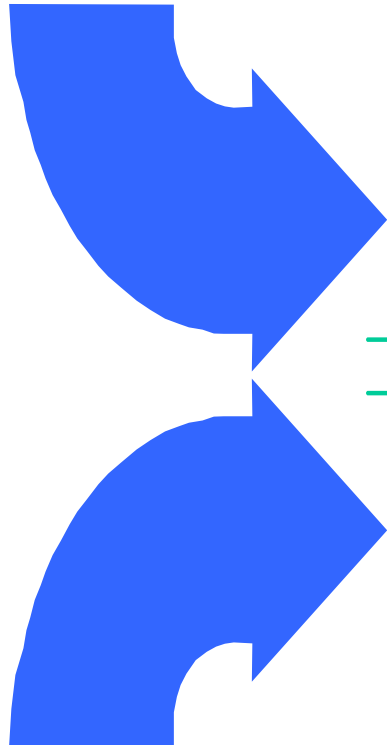
continuous to discontinuous

# Drivers for innovation

- Financial pressures to reduce costs, increase efficiency, do more with less, etc
- Increased competition
- Shorter product life cycles
- Value migration
- Stricter regulation
- Industry and community needs for sustainable development
- Increased demand for accountability
- Demographic, social and market changes
- Rising customer expectations regarding service and quality
- Changing economy
- Greater availability of potentially useful technologies coupled with a need to exceed the competition in these technologies

# Core process of product innovation ...

Technological Innovations



Investments

New products  
which meet  
Customer  
satisfaction

Customer Needs

An Innovative Product - Emergency flashlight, the world's most reliable flashlight, guarantees light without batteries, forever !



# Environmental/Demographic Changes

## Environmental

- Health consciousness leads to Kraft's 'fat free' ice-cream
- 'Green' consciousness leads to change in solvent based to water based paints
- Increase in crime leads to new security devices (e.g. remote control security systems)

## Demographic

- Ageing of population leads to residential care insurance
- Both parents working leads to new types of convenience foods
- Baby boomers having their own children leads to new types of family car (e.g. Renault Espace)



# Evolution of the



Alexander  
Graham Bell's  
Phone  
1876



Old Phone

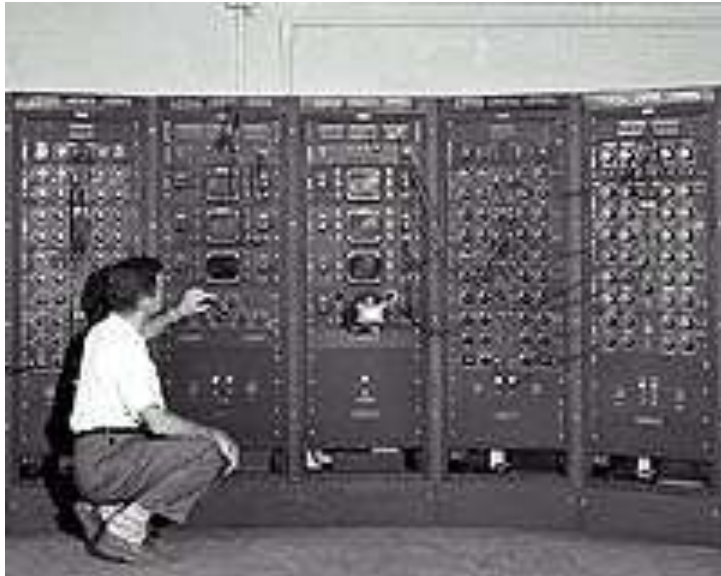


1<sup>st</sup> Cell Phone  
March 6, 1983



Razr 2006

# Telephone



Old  
Computers

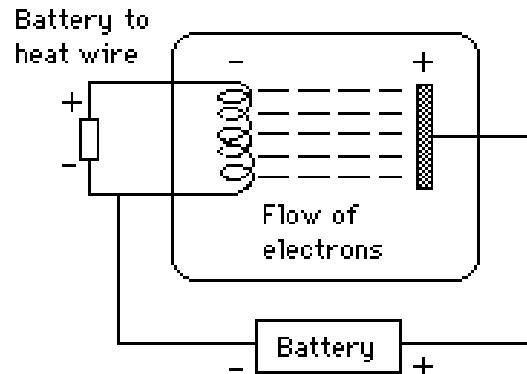


Dell  
Computers  
2006



# Discovery

- Discovery is the primary process used in science to uncover new knowledge.
- Thomas Edison invented over 1000 patents, but only made one scientific discovery. This discovery was called the “Edison Effect”.



# Creativity

- The ability to see a problem in several dimensions.
- The ability to truly understand the problem at hand.



# Inventors

- Thomas Edison
- Benjamin Franklin
- Alexander Graham Bell
- Henry Ford



"INSANITY  
IS DOING THE  
SAME THING OVER  
AND OVER AND  
EXPECTING A  
DIFFERENT RESULT."

--ALBERT EINSTEIN

