



Your Guide to Innovation.

Making sense of it all.

Dr. Dorel Iosif

CEO & Board Director - Cognisium

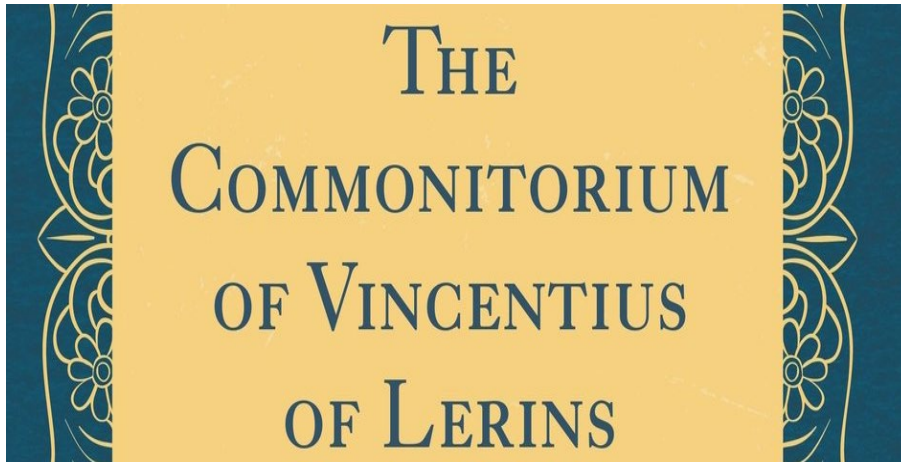
Managing Partner - Lavaux Global

Topics

- History of Innovation
- Closed and Open Innovation
- Case Study: US Defence Advanced Research Projects Agency (DARPA)
- Practical Advice for Innovation Set-up



A Brief History of Innovation



Vincent de Lerins

c. 434



Galileo Galilei

1564 - 1642



What is Innovation?

Innovation is the creation of a viable offering.

Innovation

.. 1934, Schumpeter: “new combinations” of new or existing knowledge, resources, equipment, and other factors

.. and arranging the economic requirements for implementing an invention.

Invention

.. an act of “intellectual creativity” and novelty.

.. Bohr’s quadrant in Stokes matrix.



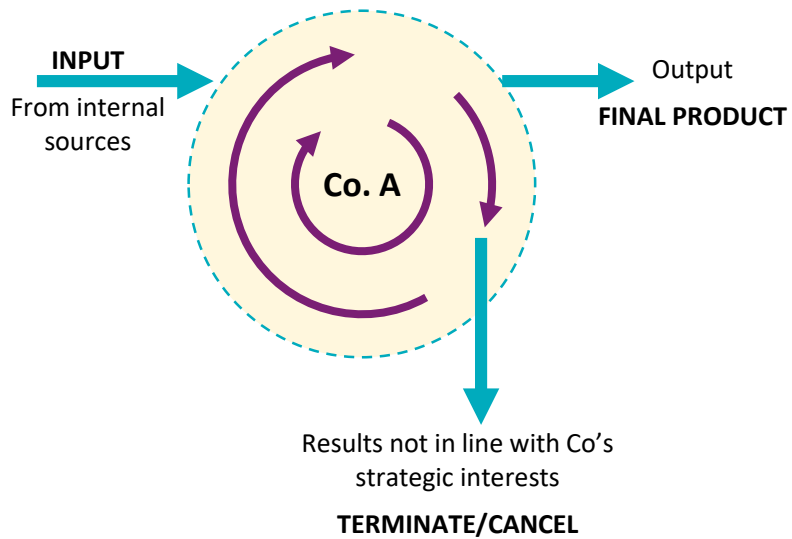
Closed vs Open Innovation

- The smart people in the field work for us.
- Not all the smart people work for us, we must tap into the knowledge and expertise outside our ecosystem.
- To profit from R&D, we must discover it, develop it, and ship it ourselves.
- External R&D can create significant value: internal R&D is needed to claim some portion of that value.
- If we discover it ourselves, we will get it to the market first.
- We don't have to originate the research to profit from it.

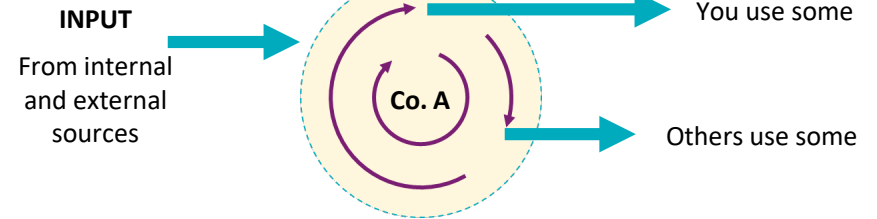


Open Innovation

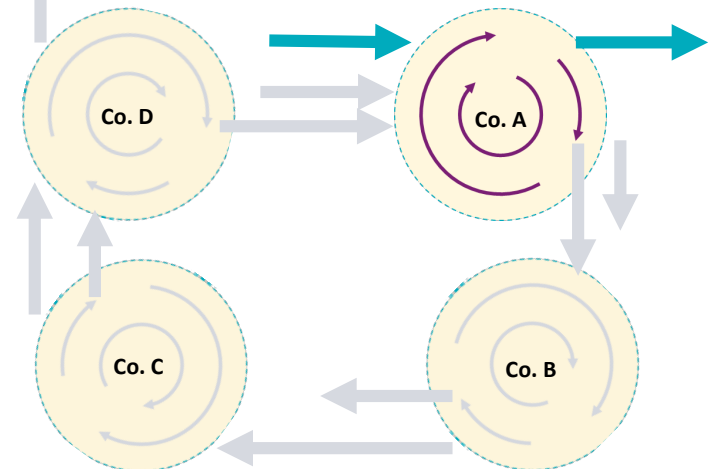
Closed Innovation Model



OPEN Innovation Model



OPEN Innovation Network Model

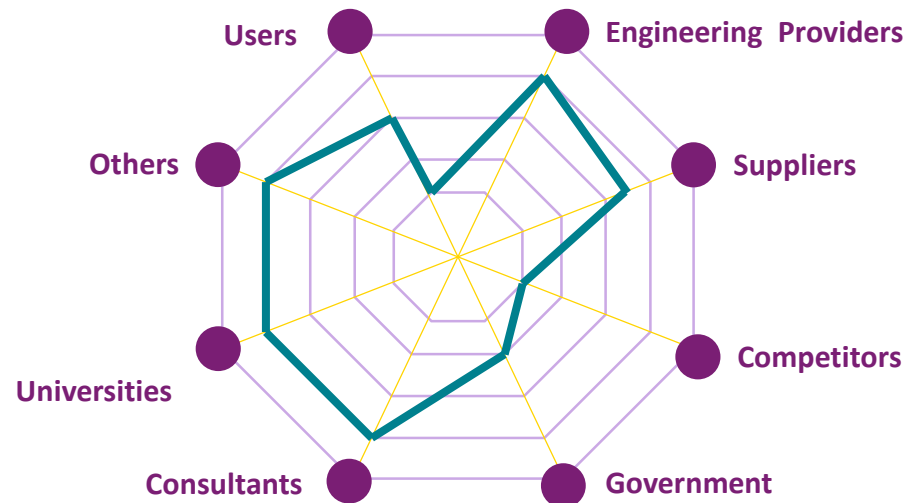


Main Partners in Open Innovation

Open business model implies a new approach to Intellectual Property (IP) management.

Companies must **bypass defensive reactions** to consider IP as a strategic asset, allowing interaction with their environment.

PE and VC firms can play an important role in the OI process providing not only funds, but also competencies and networks to entrepreneurs.



1. How to choose the right business partner?
2. How to shift mindset and culture?
3. How to protect IP?



A Simplistic View

How much do you focus on:

Technological innovation

vs.

Business Model Innovation

Requires
NEW
Business Models

DISRUPTIVE

- Open Source Software
- Vide On Demand
- Ride-sharing Services

ARCHITECTURAL

- Pharma - Personalised Medicine
- Kodak - Digital Imaging
- Newspapers- Internet Search

Leverage
EXISTING
Business Model

ROUTINE

- BMW- Next-Gen 3 Series
- Vanguard – A New Index Fund
- Pixar – A new 3D Animated Film

RADICAL

- Pharma Co's– Biotechnology
- Aircraft Manf – Jet Engines
- Telcos – Fiber-Optic Cable, 5G

Technological Breakthrough

Gary Pisano, HBS



Thorough View - 11 Types of Innovation

CONFIGURATION

- PROFIT MODEL
- NETWORK
- STRUCTURE
- PROCESS

FOCUSED ON THE INNERMOST WORKINGS OF AN ENTERPRISE AND ITS BUSINESS SYSTEM.

OFFERING

- PRODUCT BREAKTHROUGH
- PRODUCT PERFORMANCE
- PRODUCT SYSTEM

FOCUSED ON AN ENTERPRISE'S CORE PRODUCT/SERVICE OR A COLLECTION OF ITS PRODUCTS OR SERVICES

EXPERIENCE

- SERVICE
- BRAND
- CHANNEL
- CUSTOMER ENGAGEMENT

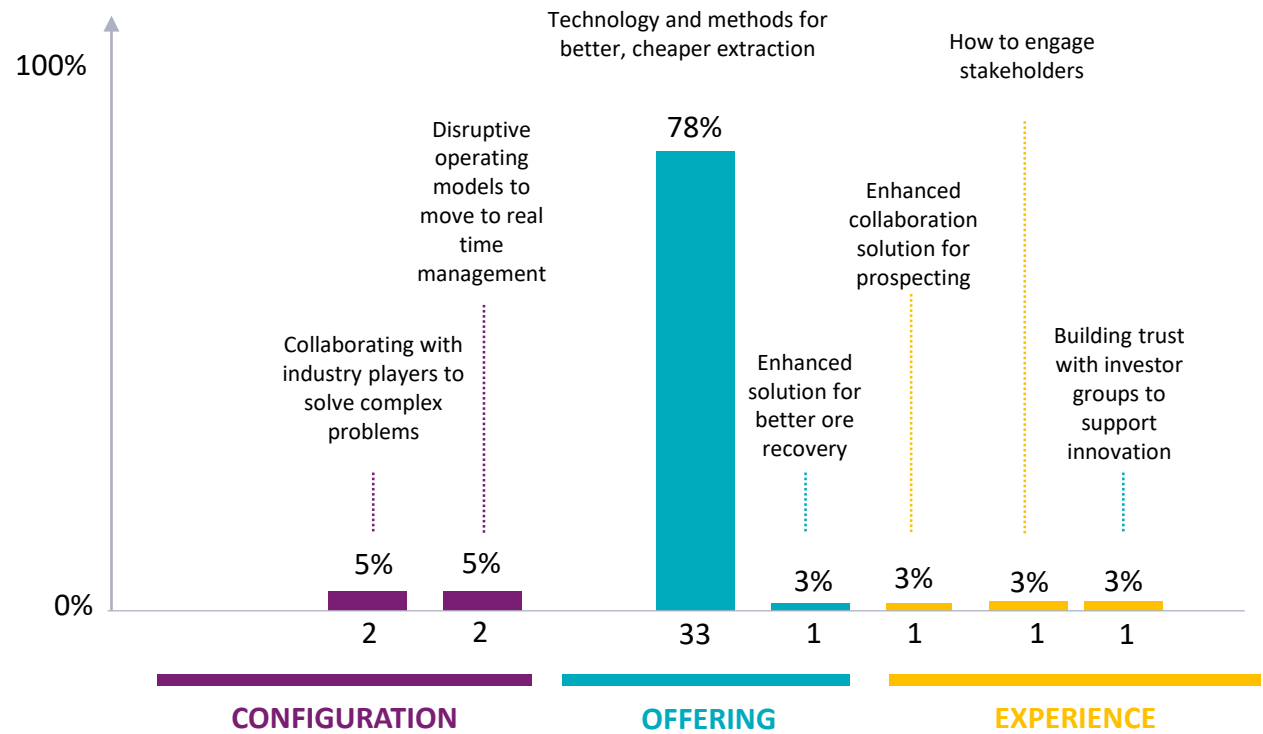
FOCUSED ON CUSTOMER-FACING ELEMENTS OF AN ENTERPRISE AND ITS ECOSYSTEM



Innovation in Mining

Study conducted by the Prospectors and Developers Association of Canada (PDAC)

19 mining companies



41 instances of innovation

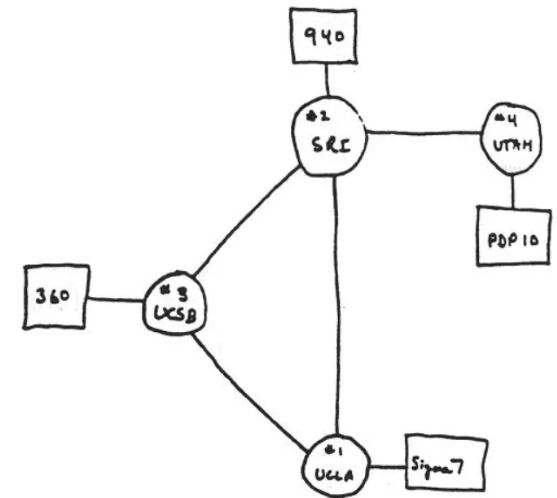


Defense Advance Research Project Agency DARPA

The **most innovative** enterprise unit in modern history

December 5, 1969—the U.S. Department of Defense's Advanced Research Projects Agency (ARPA) connected four computer network nodes at the University of California, Los Angeles, (U.C.L.A.), the Stanford Research Institute (S.R.I.) in Menlo Park, Calif., U.C.

Sigma 7 computer at UCLA's Network Measurement Center that Vint Cerf connected to ARPANET.



THE ARPA NETWORK

DEC 1969

4 NODES

Early sketch of ARPANET's first four nodes

Courtesy of Alex McKenzie



DARPA - Innovations

The **most innovative** enterprise unit in modern history

DARPA Budget : ~3bn /200 projects

Google R&D Budget : ~32bn

- The Internet
- Multiplexed Information and Computing Service MULTICS (The Cloud)
- Global Positioning Satellites GPS
- Stealth Technology
- UAV (drones)
- MEMS
- Cognitive Assistant that Learn and Organizes CALO (precursor to Siri)
- Aspen Movie Maps with MIT – precursor to Google Maps

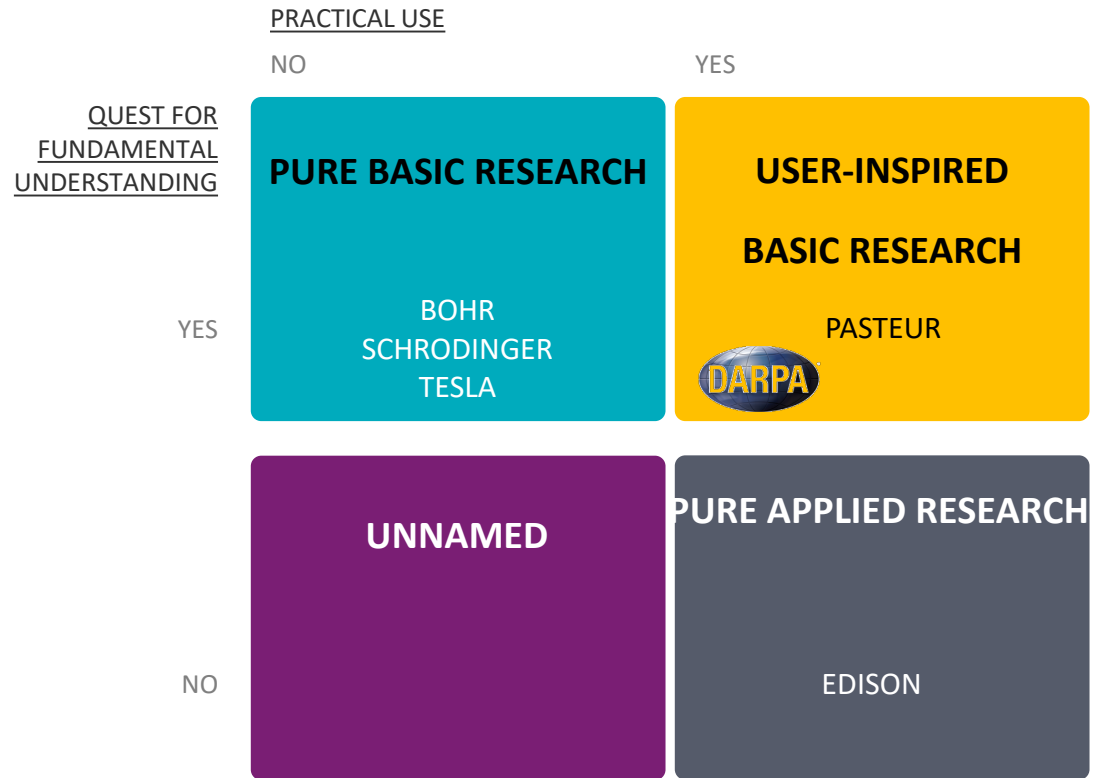


DARPA – Innovation Model

1. Ambitious Goals

2. Temporary Project teams

3. Independence



Donald Stokes (Princeton) 4 Quadrants



Practical Advice – Innovation Set-up

THE ISSUE

Traditional approach to Corporate R&D have difficulty to consistently deliver breakthrough innovations.

WHY IT OCCURS

Compromises made to reduce risk or to avoid disrupting existing businesses result in evolutionary- but rarely breakthrough-innovations.

THE SOLUTION

A “special forces style” development group modeled after DARPA. Key elements include:

- Tackling projects that advance science and solve significant issues
- Assembling the best minds from industry, academia for limited periods to create diverse, agile and scalable teams
- Allow independence from the mainstream organization in project selection and execution.

DARPA, Regina Dugan Framework



Practical Advice – Innovation Set-up

PRE- ORGANISING

DEFINE A PROJECT

TIME LIMITS

TEAM

PROJECT LEADER

INDEPENDENCE

PRE- ORGANISING

DEFINE A PROJECT

TIME LIMITS

Are you living in Pasteur's quadrant?

Corporate sends the R&D to BU to be funded – wrong approach

Aim: to create a small dedicated independent organisation to work in Pasteur's quadrant

1- Recognise that a technological or scientific field has emerged or reached an inflexion point, that it can solve a practical problem of importance

2- Willingness to uncover an emerging user need that existing technologies are unable to address.

Fixed duration and tenures (3-5 years) → create a sense of urgency

Forces team as a whole to benchmark progress and challenge “how things have always been done”.

Allows company to alter its portfolio of projects faster and reassign work.



Practical Advice – Innovation Set-up

PRE- ORGANISING

DEFINE A PROJECT

TIME LIMITS

TEAM

PROJECT LEADER

INDEPENDENCE

TEAM

Co-opt partners from industry, academia, government*

Collaboration to be encouraged peer to peer, without formal “all-team” involvement

Create fast iterative cycles of collaboration
Members work in their respective organisations.

PROJECT LEADER

Find them through extended network (academia, industry).
Outsiders take greater risk.

Ambidextrous, handle technical details able to make all major decision without BU interference

Confidence, resilience, deep domain expertise, speaking engagements

INDEPENDENCE

Function in ways different from parent company

Breakthroughs may lead to new business that requires departures from current business model

Establish a multi-year budget with critical mass and give control

Reports to CEO



Thank you.

Dr Dorel Iosif

Managing Partner - Lavaux Global

CEO, Board Director - Cognisium

dorel@cognisium.com



