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TIPS ON TECHNOLOGY COMMERCIALIZATION AND LEVERAGING OF INTELLECTUAL PROPERTY RIGHTS: AN EYE OPENER FOR UNIVERSITY ACADEMIA

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ABSTRACT

Technology commercialization is the process of transforming an idea or scientific discovery into new or improved product, process or service. Technology commercialisation process is complex, non-linear, with false starts, dead ends, changes in direction and feedback loops. It requires different skill sets, namely: scientific, technical, business and marketing. There are various options for realizing value, namely: licensing, start-up and alliance. An idea or discovery, by itself, has no direct economic value, but rather economic value is created when an idea or discovery finds an application and gets translated into a product, process or service. Commercialization provides returns to public investment in research and ensures that new and promising ideas become seeds to innovative products and services. Commercialization leads to creation of new ventures which are needed for competitiveness and economic growth. Technology commercialisation happens post-research and has about 6 major steps: discovery, proof of concept, product development, market-ready product, marketed innovation, and demand for innovation. The circle repeats once it reaches this end. Discovery/conceptualisation phase has shown that ideas evolve through constant iteration between a new technological capability and market need. Researchers generate new technological possibilities that are embodied in new discoveries and methods. Research could be triggered by real or perceived market needs or by researcher's own convictions or interests. Proof of concept entails evaluation of the technological feasibility and commercial viability of a technology. Product development refers to the entire process of: identifying a market opportunity; creating a product to appeal to the identified market; testing/trials; and modifying and refining the product. This paper will present tips on how University academia could move from plain research engagement to research outputs implementation or transfer for commercialisation.

Keywords: *Intellectual Property rights, Licensing, Technology transfer, Patenting*

INTRODUCTION

Technology commercialization is the process of transforming an idea or scientific discovery into new or improved product, process or service. The process is complex, non-linear, with false starts, dead ends, changes in direction and feedback loops. It requires different skill sets: scientific, technical, business, marketing. There are various options for realizing value, namely: licensing, start-up, alliance. This paper covers: Technology commercialization scope; Importance of technology commercialization;

Technology process; Options for technology commercialization; Agents in technology commercialization; and Determinants of commercialization success.

IMPORTANCE OF TECHNOLOGY COMMERCIALIZATION

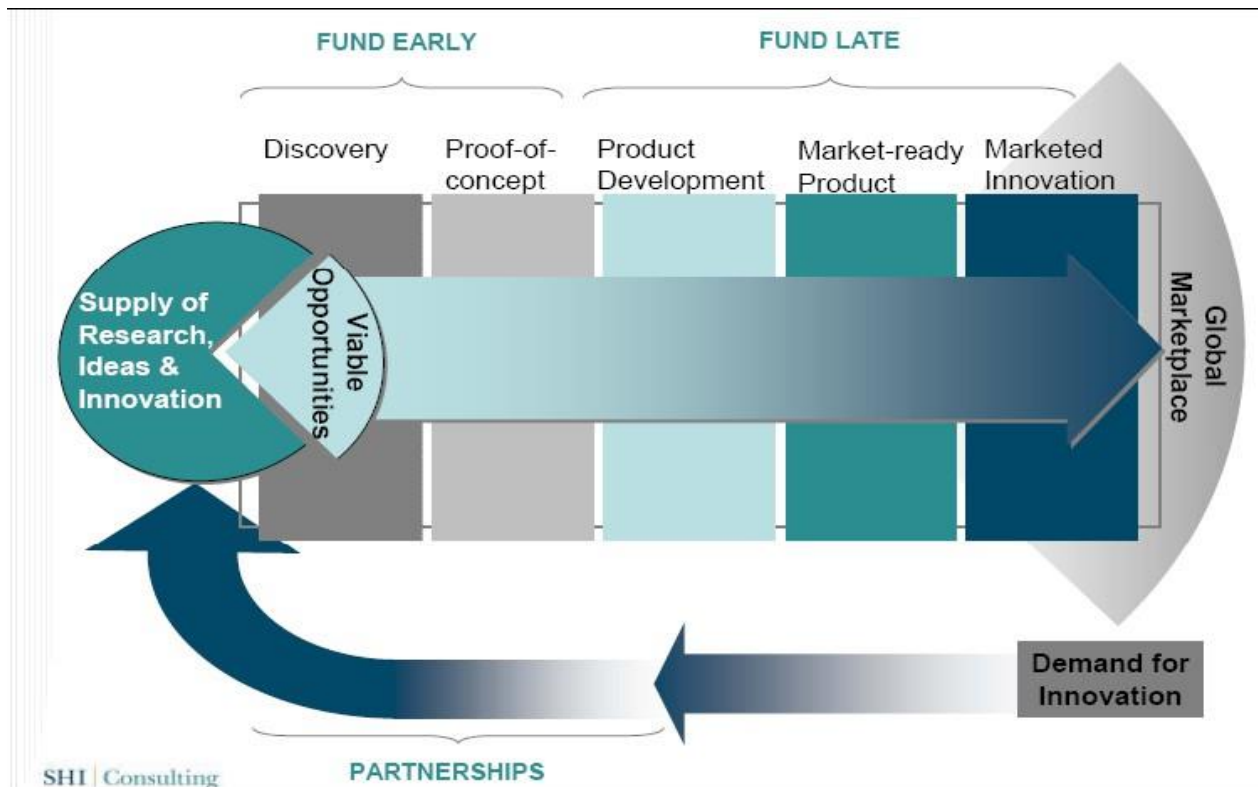
An idea or discovery, by itself, has no direct economic value. Economic value is created when an idea or discovery finds an application and gets translated into a product, process or service. Commercialization provides return to public investment in research. It ensures that new and promising ideas become seeds to innovative products and services. Commercialization leads to creation of new ventures which are needed for competitiveness and economic growth.

TECHNOLOGY COMMERCIALIZATION PATHWAYS

University practitioners should not operate in isolation, but should interlink as shown below:



TECHNOLOGY COMMERCIALIZATION PROCESS



Pathways from discovery to the marketplace: Commercialization is non-linear with feed-back loops

1. Discovery/Conceptualisation Phase

- Technology commercialization commences with the techno-market insight
- Ideas evolve through constant iteration between a new technological capability and market need
- Researchers generate new technological possibilities embodied in new discoveries and methods
- Research could be triggered by real or perceived market needs or by researcher's own convictions or interests

You need to start with many ideas to get one successful product

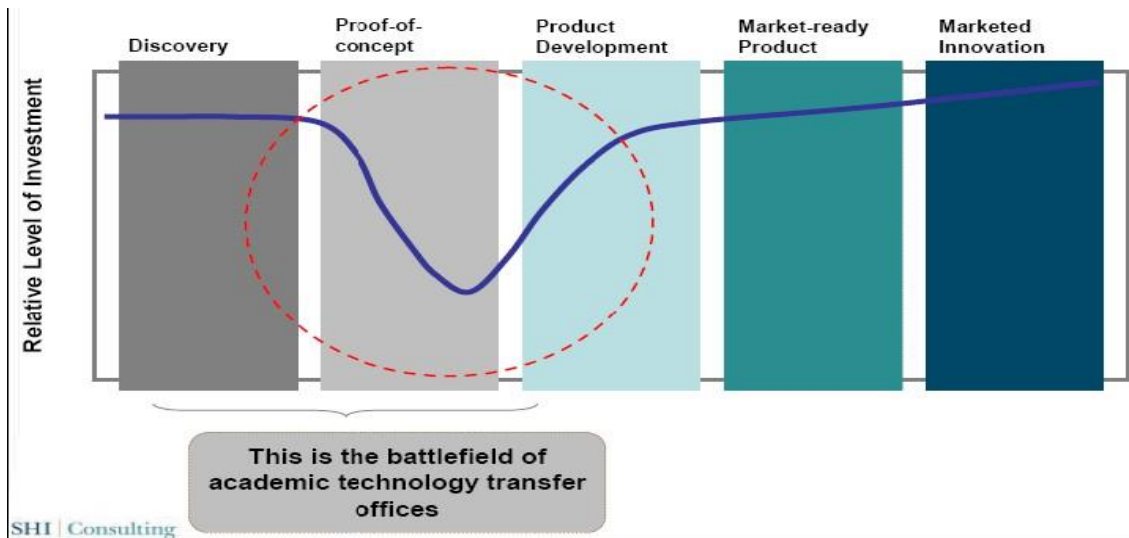


2. Proof of Concept Phase

Proof of concept entails evaluation of technological feasibility and commercial viability of technology

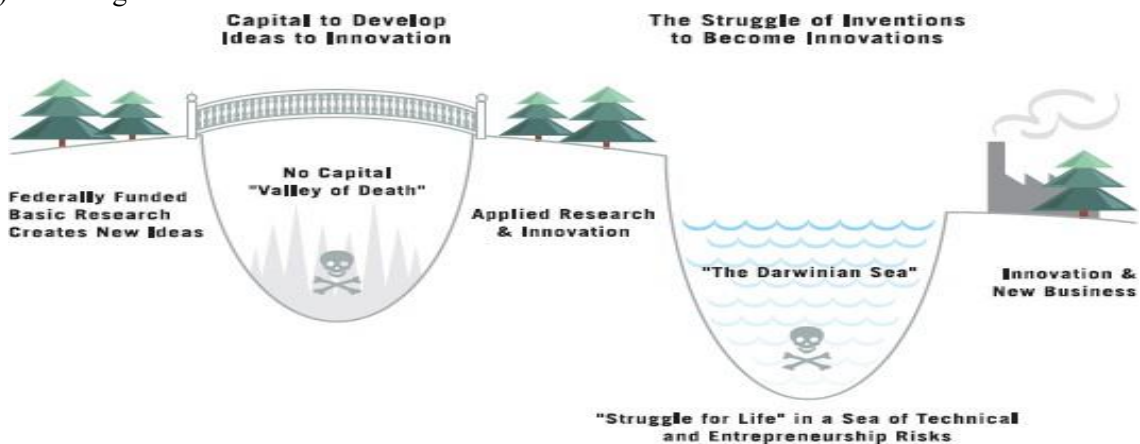
- How is it done?
 - prototype for product/service
 - scaling-up and/or pilot plant for process

•This phase involves high risks, requires large resources and is frequently the end of the commercialization initiative – the phase commonly termed as “Valley of Death”

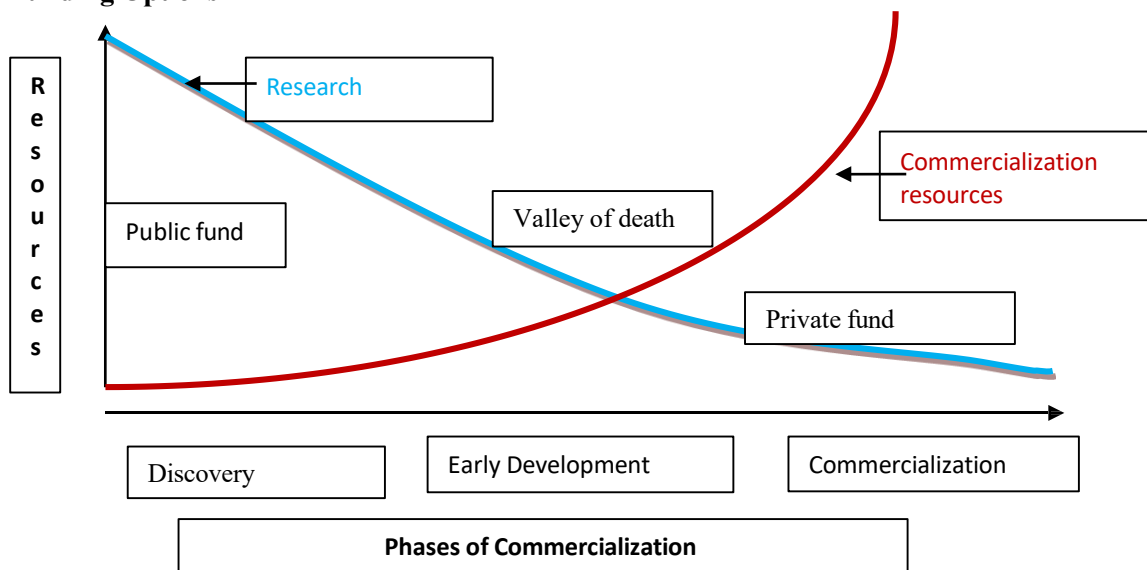


Resources for Technology Commercialization

(a) Challenges



(b) Funding Options

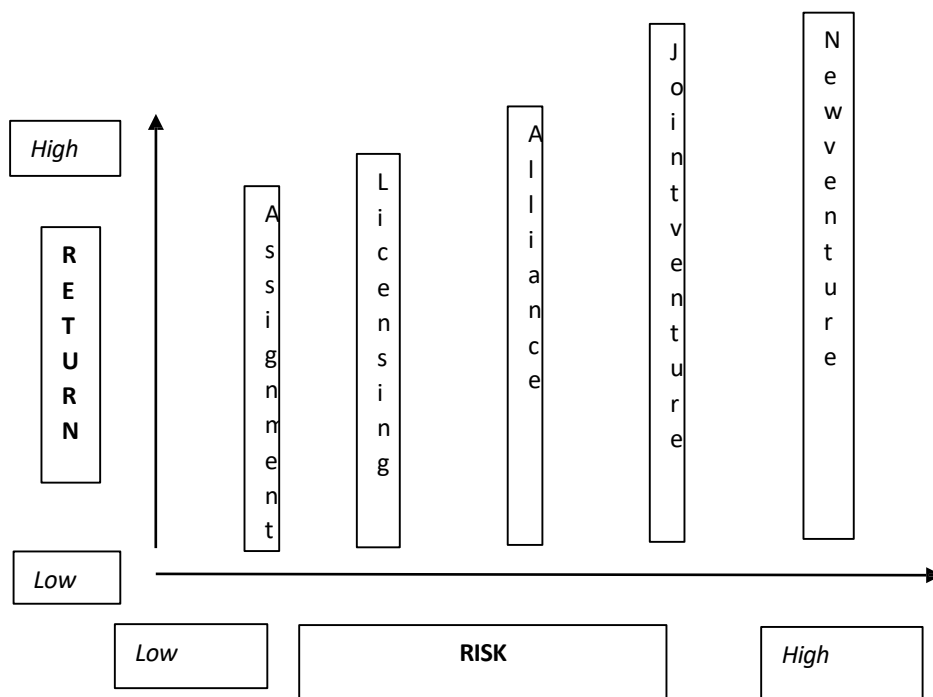


3. Product Development Phase

Product development refers to the entire process of:

- identifying a market opportunity
- creating a product to appeal to the identified market;
- testing/trials; and
- modifying and refining the product

4. Technology Commercialization Options



(a) Sale or Assignment of IP Rights

- Sale by owner of all his exclusive right to an invention to another person or legal entity
- Outright sale is suitable for common technologies
- The permission by the owner to a patented invention to another person or legal entity to perform one or more of the 'acts' which are covered by the exclusive right to the patented invention

Examples of Patents: Very straight forward stuff

- An asparagus production technique for the subtropical region.
- A micropropagation technique for virus-free garlic.
- A micropropagation technique for giant taro.
- 'Improved Chancellor' grape.
- Piperine, Piperidine alkaloid from *Piper nigrum* L. as a synergist to pyrethrins for the control of insect pests and vectors.
- Improved process and associated technology for pre-drying green leaf tea.
- Headwear.
- Remote Global System for mobile communication internal lock.
- Patenting is happening monthly. For more info, logo onto: <http://www.kipi.go.ke/index.php/patents>

(b) Licensing

- Licensing is one of the most common modes of technology commercialization
- Financial compensation typically include:
 - Up-front fees or lump-sum payments
 - Running royalties (e.g. based on sales volume)

–Milestone payments

Types of Licenses

Exclusive

- Only one licensee has the rights to exploit the invention
- Desirable for high risk investment
- Necessary to “induce” investment

Non-exclusive

- Similar licenses may be granted to more than one company
- Invention is a broadly applicable process
- Invention is useful to many companies thus not necessary to “induce” investment

Partially Exclusive

- Same technology licensed again for a different geographical region or for a different application
- Agreement must specify field of use or application
- Licensee has the rights to exploit only for the specified application

(c) Alliance

• Collaborating with another person or legal entity to acquire assets or expertise to complement the capabilities of the owner of the invention and that are essential to bring the invention to the market

• Examples of complementary assets are:

- Distribution channels
- Specialized manufacturing capabilities
- Sales force
- Other expertise

(d) Joint Venture

• A contractual agreement between two or more parties for the purpose of executing a business undertaking with mutual sharing of profits and losses

• There are 2 basic forms of joint venture (JV) namely equity JV and contractual JV

- The equity JV is an arrangement whereby a separate legal entity is created
- A contractual JV might be used where the establishment of a separate legal entity is not needed or where it is not possible to create such an entity

(e) New Venture

- Creation of new business or “start-up” by licensing technology
- Sometimes called “entrepreneurial technology transfer”
- In the USA 1-2 spin-offs per US\$100 million research expenditure; best practice 5-20 spin-offs per US\$100 million research expenditure)

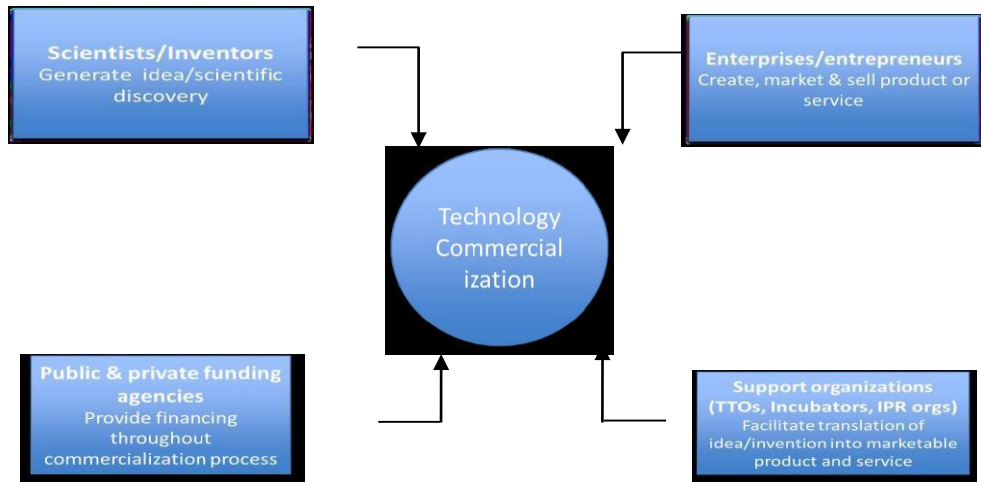
DETERMINANTS OF COMMERCIALIZATION SUCCESS

- A compelling commercial concept
- Continuing validation through the acquisition of new, ‘smart’ and meaningful investment
- A ‘champion’ well-matched to the needs of the project, especially during the uncertain early phases
- Conducive environment (e.g. supportive organization culture, compatible incentives, enabling laws)
- Efficient access to external networks of resource providers

- Efficient mechanism to share information within organization and with potential resource providers

AGENTS IN TECHNOLOGY COMMERCIALIZATION

Technology commercialization involves multi-sectoral collaboration sketched below. All must integrate to realise success.



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REFERENCES

Isutsa, D. K. (2014). Proceedings of the MTCP-MTDC Technology Commercialisation Workshop for Practitioners from African Countries held from 23rd to 27th June, 2014 in Malaysia. Chuka University, Chuka, Kenya. Available at: <http://www.chuka.ac.ke>