Linking Universities and Research Centers to the Public and Private Sector for the Management, Promotion and Commercialization of IP Assets: Spin-offs and Start-ups

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PRESENTATION OUTLINE

- The Role of Universities and R&D Institutions in technological and economic development
- Linking research to industries through Commercialization and technology transfer
- Spin-off and Start Ups Company
- Kenyan Experience: The case of KIRDI
1. **Role of Universities and Research Institutions in Technological and Economic Development of the Country**

i). Mandates of Universities and R&D Institutions

**Universities**
- R&D
- Teaching
- Extension

**R&D Institutions**
- R&D
- Extension

- Capacity Building
- New knowledge
- Knowledge Transfer

Technological development
ii) Direct Products of the research

- Teachings- skills and capacity building
- New technology
- New knowledge
- New products
- New processes
- Improvement of existing technologies, products, process
iii). R&D and Economic development

- The new knowledge, products, processes or improvement of the same should lead to technological and economic development through:

1. JOB CREATION
2. ECONOMIC DEVELOPMENT
3. INCREASE IN GDP
iv) Universities’ and R&D Targets

R&D Products targets the following main end users

- Small
- Micro
- Medium

R&D Products
v). How Universities and R&D should Contribute to SMEs growth

- Through commercialization of research products (new products, processes, technologies) should lead to:
  - Creation of new Small and Medium Enterprises
  - Enhanced growth of existing ones through extension services such as short courses, consultancies and technology transfer.
  - Technology transfer is Key to above
6. Contribution to SMEs growth

- R&D products must be transferred to the end users.
- Knowledge generated and not transferred are of no benefit to the society.
- For a long time Universities and R&D institutions have been seen as “ivory towers” far much removed from the society in which they exist.
- These institutions must contribute to the technological and economic development of the country.
- MUST start providing knowledge and information necessary for promoting technological development.
- Align research to respond to the needs of the society
7. Challenges facing technology transfer from Universities and R&D Institutions in Africa

- Focus on publication as opposed to patenting
- IP is new in most countries and yet to be embraced
- Weak linkages between these institutions and industries
- Lack of skills and infrastructure required in technology transfer
- University seen as ivory towers far much removed from the society in which they exist
2. LINKING RESEARCH TO INDUSTRIES THROUGH COMMERCIALIZATION AND TECHNOLOGY TRANSFER

i). Commercialization

- Innovations need to be commercialized, if there are to have any benefit.
- The commercialization process translates the innovation into a product or service that can be used or applied in the market place.
- Inventions are of no use if they are not marketed and commercialized.
- Technology transfer and commercialization are the means with which the research products meets the market place.
II. IP COMMERCIALIZATION METHODS

CREATE  PROTECT  OWN THE IP RIGHT  COMMERCIALIZE

- Own exploitation
- Donation
- Licensing
- Outright sale
- Join Ventures
- Spin outs
- Start ups
Exploitation of IP Assets

1. Own exploitation

An inventor chooses to exploit its IP Assets if:

- Necessary resources available
- You have business skills
- There is reasonable market for the product
- Expected royalty of the IP Assets is too low

2. Joint Ventures

- Inventor invites investor to jointly exploit IP
- The IP is valued and converted into equity
- Investor bring money
- Inventor (University) brings technology and know-how
3. Business Incubation Services

1. Role of the Incubator
   1. Capacity building
   2. Technology and skill
   3. Marketing Access
   4. Business Information
   5. Supply pre-financing
   6. Negotiation with the government

2. Success factors
   1. Increases survival rates from 20 to 80%
5. Licensing

Licensing of IP Assets
- Owner of the IP asset allows another to exploit and in return get royalties
  - No financial resources
  - No business skill
  - No time

- Technology Licensing
- Trademark Licensing
- Copyright Licensing
- Franchising
ADVANTAGES OF LICENSING TO THE LICENSEE AND LICENSOR

For Licensor:
- Rely on better manufacturing capacity, distribution outlets, local knowledge and management of the licensee;
- IPR retained by licensor
- Access to new markets,
- Turning potential infringer into partner;
- Provides some Degree of Control over innovation, direction, and evolution of technology;

For the Licensee:
1. Quick response to the market needs using innovative technology;
2. No need of own research resources base – still have access to technical advances that are necessary in providing new or superior products;
3. Improve a company’s technological portfolio
DISADVANTAGES

FOR THE LICENSOR

1. A licensee can become a licensor’s competitor – especially when they are operating in the same territory.

2. When technology is not clearly defined, a license agreement can be disadvantageous, for it may require continual service from the licensor.

3. The licensor may become critically dependent on the skills, abilities and resources of the licensee for generating profit.

FOR THE LICENSEE:

1. Risk of making financial commitment when the technology is not “ready” to be commercially exploited;

2. A technology license may add a layer of expense to a product that is not supported by the market for that product;

3. The risk of becoming too technologically dependent – in the long-run it may become a barrier to their future expansion;
4. Companies

Spin outs = Creation of a company by RTO to commercialize an IP

Start ups = Creation of company by investors from outside based on IP Assets of an RTO
SPINOUTS COMPANIES

- The term university spinout refers to those companies that are formed around one or more faculty inventions, with involvement of the faculty inventors and cooperation of other staff.
WHY SPINOUTS

- SPIN OUTS PROVIDE MANY BENEFITS
- The public may have access to new products or services
- success is maximized
- Enhancement of the institutions image
- improved faculty retention
- Local regional, and national n to the institution
- Economic returns to the institutions and inventors
HOW THEY ARE FORMED

- Carry out technology and market assessment
- Identify an experienced business manager to join the team (CEO)
- That has a track record in the technological area thus attract investors
- CEO must understand the researchers and investors needs
- Identify management team for the company
- Adequate financing must be obtained
- Have support from the broader staff of the university
HOW ARE SPIN OUT FORMED

- **Risks of spin out company**
  - Managers are often less experienced
  - Personnel may be working together for the first time
  - Financing usually from venture capitalists who during low economic growth prefer to invest in existing companies
START-UPS

- Company created by people outside a research institution.
- A start-up is built on a license for one or more technologies, draws its other resources (such as management) from elsewhere.

SPINOUTS

- Company is created when an institution invests its own resources to form and incubate the company up through the first round of venture capital investment.
- The creation of a spinout usually involves the transfer of existing university staff into the new company, either on a permanent or on a secondment basis.
Advantages.

- The institution is using already existing resources (staff and facilities)
- The public may have access to new products or services
- Success is maximized
- Enhancement of the university’s and faculties image
- Improved faculty retention
- Economic development
- Economic returns to the university and inventors
- There is commitment from staff to ensure that the company succeeds as opposed to exiting company which may not identify strongly with the new technology thus success is limited
- Investors in the new technology desire a relationship with inventors of the licensed technology
**Disadvantages**

- May be a drain on experienced resources of the university especially in terms of staff.
- Such institutions will create fewer companies using their resources particularly compared to the number and quality that they could deliver by attracting resources into the institution.
- Companies formed since they are the only alternative available for converting the technology into useful products and services.
In U.S In 2000
500 new companies were formed to exploit the technology based on academic inventions in the 121 universities
80% of these companies was based in the university home state
More than 600 licenses to these new companies accounted for 14% of the total number of licenses reported
Additional 50% of all licenses were to small companies those with fewer than 500 employees
EXAMPLES OF INSTITUTIONAL SPIN OUT COMPANY

- In 2003, U.S universities reported 374 licenses to spin out companies
- By 2005, Stanford university established 140 companies
- Spin out companies are sources of new jobs
- Can produce for exports
- **Hewlett Packard** in Silicon Valley have grown from spin out companies to major companies
Story of the Silicon Valley and its legendary spinout successes was enabled by contributions of universities.
The region is home to many of the world's largest technology corporations.
The term originally referred to the region's large number of Silicon chip innovators and manufacturers, but eventually came to refer to all the high-tech businesses in the area.
Despite the development of and the world, Silicon Valley continues to be the leading hub for high-tech innovation and development, accounting for 1/3 of all of the venture capita; investment in the United States.
Governments everywhere are creating policies and laws to encourage spin outs based on IP rights from University

In UK the number of licensing agreements from universities to companies have fallen due increased pressure from government for creation of more spin outs as opposed to licensing parse

Create new jobs
Contribute to economic development
Potential to grow into larger multinational companies
3. KIRDI’S R&D STRATEGY

i. Mandate of KIRDI

- KIRDI was established under the Science and Technology Act Cap 250 of 1979 as a corporate body and mandated to;
  - First undertake industrial research and development in all industrial and allied technologies including mechanical, civil, electrical, chemical engineering, energy, environment and commodity technologies (food, leather, textile, ceramics).
  - Second to disseminate and transfer of the knowledge generated to the society through extension services.

For a long time KIRDI had concentrated on R&D with little emphasis on Technology Transfer to Industries.
The direct Results of our R&D

- **New Technology**
- **New Product**
- **New Process**
- **Improvement in existing product, process or technology**

These products must lead to

**Economic development, Industrialization, Job creation and Poverty Reduction**
iii. Alignment to Changing Emphasis on TT

Strategies in place

- Technology development through research and development.
- Prototype development
- Transfer of KIRDI’s research output to investors
- Patent documentation and reverse engineering.
- Provision of common manufacturing facility for growth oriented SMEs.
- Manufacturing oriented business incubation services.
4. TECHNOLOGY TRANSFER AT KIRDI

ONE STOP SHOP FOR TECHNOLOGY DEVELOPMENT AND TRANSFER

- Technology Transfer Department
- IP Office and Policy
- Prototype development policy
- Business incubation services
- Pilot plants (Start Ups and Spin Offs)
- Common manufacturing facilities
- Reverse Engineering

KIRDI ➔ ONE STOP SHOP ➔ SMEs

SMEs ➔ ONE STOP SHOP ➔ KIRDI
v. Innovation and Entrepreneurial Support Structures

- Technology Transfer Office
- Business Incubation Services
- University Companies
- Industrial/Science Park

Understands RTO culture, speaks the language of industry and behaves like a private enterprise
vi. Functions of Technology Transfer Office

- Creates IP awareness
- Manages IP disclosure, filing and protection
- Markets IP and negotiates for licensing
- Links researcher to investor

TTO Implements

Obligation of Research Institutions /Universities
Obligations of Inventors
Confidentiality
A. BUSINESS INCUBATION SERVICES

- Some of the companies incubated at KIRDI
- Parma medical services producing disinfectants and detergents
- Rokajo producing wine based on honey
- Kunguru foods
- Sunguprot herbal for food supplement
Products from incubatees
Training on bar soap manufacture

Training on liquid detergent manufacture
ALOE GEL EXTRACTION AND JUICE
b). Start ups and spin off companies

NYONGARA BIOGAS PLANT IN DAGORETI-NAIROBI
HONEY PROCESSING PLANT IN WEST POKOT
c). Common manufacturing facility

CMFs for leather SMEs at KIRDI and has supported more than 200 SMEs
9. Evaluation of the Outputs of KIRDI’s R&D Efforts

In terms of numbers of:

- Technologies generated
- Patent applications made
- Technologies transferred
- Enterprises created
- Companies created/supported through consultancies and capacity building
- Jobs created based on intervention of KIRDI
- Increase in sales of companies working with KIRDI‘s technologies
Kenyan institutions are putting in place infrastructure that will promote commercialization of IP Assets:

- 3 Universities with IP Policy
- 5 R&D Institutions with IP Policy
- 3 Universities with Technology Transfer Officers (TTOs)
- 2 R&D Institutions with Technology Transfer Managers
- One R&D Institution has technology business incubator
- One university is developing an Science Park
- One R&D Institution has common manufacturing facilities
- Prototype development and reverse engineering is common in universities/R&D Institutions
11. Conclusions

Commercialization of R&D outputs and Industrial Research are the two cogwheels of wealth creation.

R&D if properly managed and directed can lead to technological and economic development.
Thank you

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