



**Kenya Industrial Research and  
Development Institute**



**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**

**BY: MBOYA ROSE**

**Head of Intellectual Property Division  
Kenya Industrial Research and Development  
Institute (KIRDI)**

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# PRESENTATION OUTLINE



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- 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

# 1.0 Role of Universities and R&D Institutions in Technological and Economic Development of the Country

## 1.1. Mandates of Universities and R&D Institutions

**UNIVERSITIES**

- R&D
- TEACHING
- EXTENSION

**R&D INSTITUTIONS**

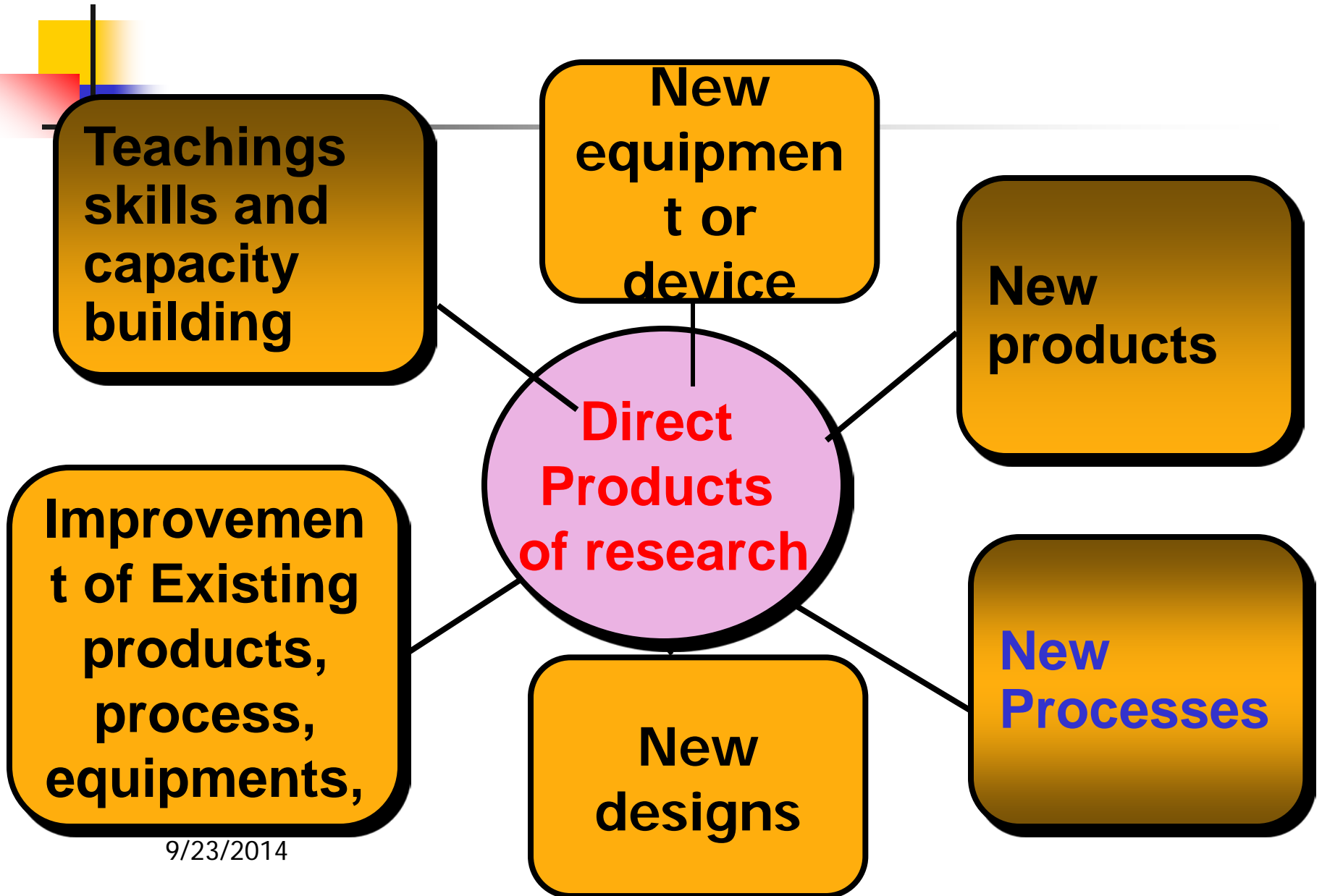
- R&D
- EXTENSION

- Capacity Building
- New knowledge
- Knowledge Transfer



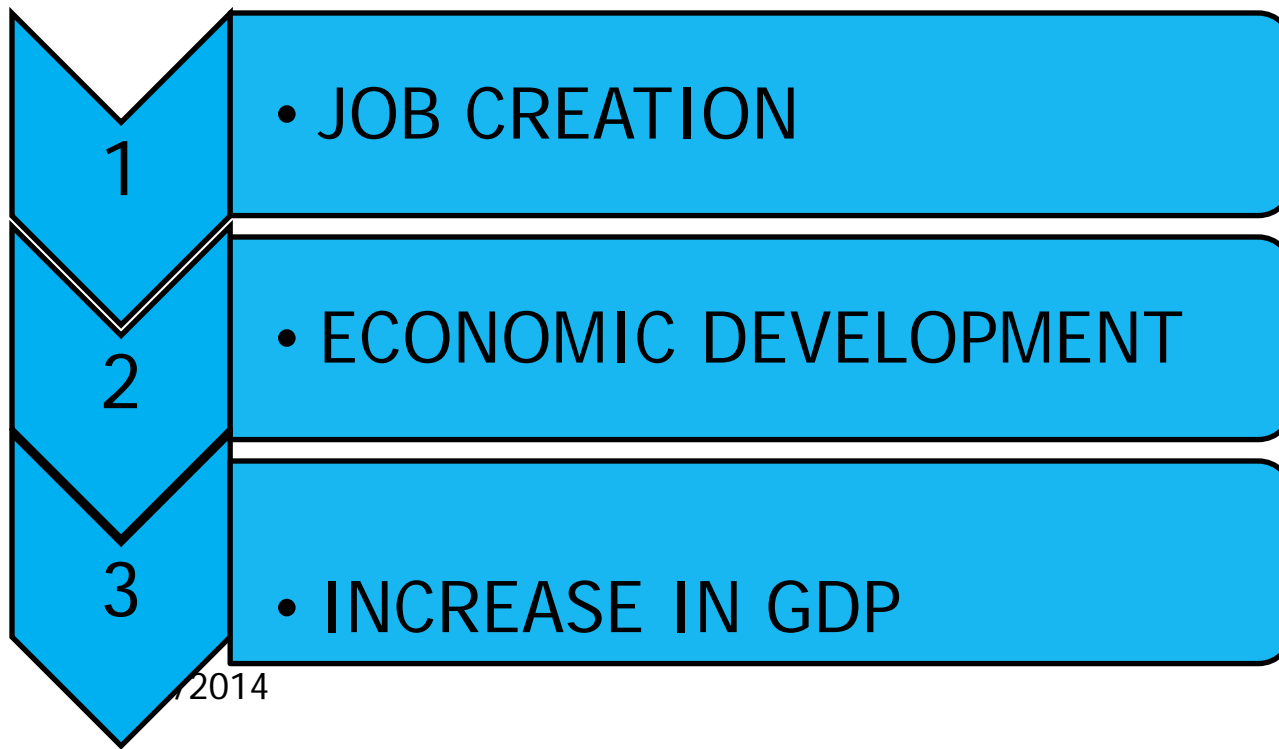
**Technological development**

# 1.2. Direct Products of Research



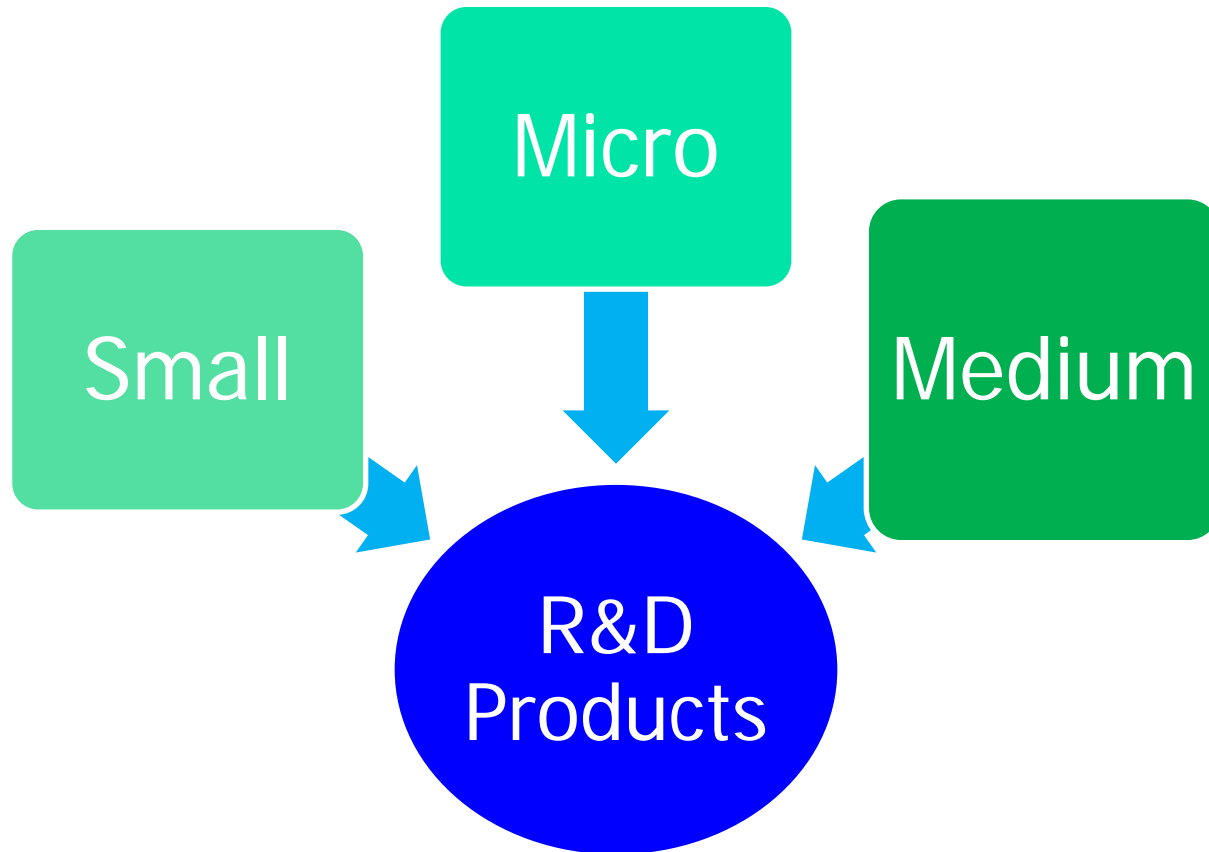
# 1.3. R&D and Economic Development

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



# 1.4. Universities and R&d Targets

R&D Products targets the following main end users



# 1.5. How Universities and R&D should contribute to SMEs growth

**INSTITUTIONAL  
IP POLICY**

commercialization of  
research products

Creation of new SMEs

Enhanced growth  
of existing ones

**Technology Transfer is Key**

# 1.6. 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**



## 1.7. 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 drafting skills for patent
- Lack of skills and infrastructure required in technology transfer
- University seen as ivory towers far much removed from the society in which they exist

**Low level of IP Awareness**

## 2.0 Linking Research to Industries through Commercialization and Technology Transfer

- **Innovation** is finding a better way of doing something.
- Innovation can be viewed as the **application** of **better solutions** that meet new requirements, in-articulated needs, or **existing market needs**.

**Innovation is a PROCESS that brings together various novel ideas in a way that they have impact on the society**

## 2.1.1. Innovation Vs. Invention

**Innovation** refers to the **USE** of a better and, as a result, **novel idea or method**, whereas **invention** refers more directly to the **creation of the idea** or method itself.

- **Innovation vs improvement**
- Innovation refers to the notion of doing **something different** rather than **doing the same thing better**.

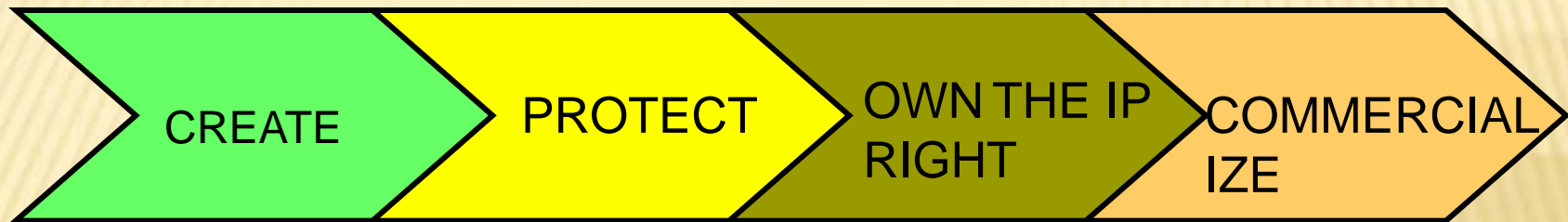
**Potential market needs are major drivers of innovation process**

## 2.2 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**

## 2.3. IP Commercialization Methods



- Own exploitation
- Donation
- Licensing
- Outright sale
- Join Ventures
- Spin outs
- Start ups

## 2.4. Exploitation of IP Assets

### 1. Own exploitation

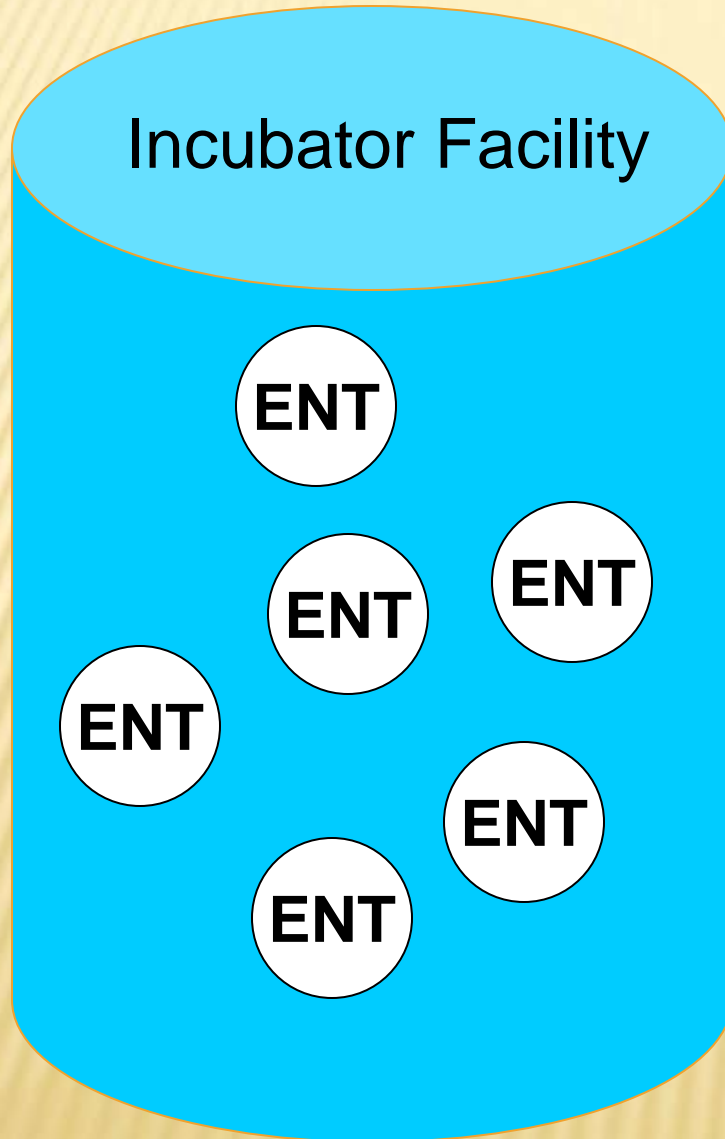
An inventor chooses to exploit its IP Assets if:

- 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



Technology  
Licensing

Trademark  
franchising

Copyright  
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



# Advantages of Licensing to the Licensee and Licensors

## For Licensors

- ✘ 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 to the Licensee

- ✘ Risk of making financial commitment when the technology is not “ready” to be commercially exploited;
- ✘ A technology license may add a layer of expense to a product that is not supported by the market for that product;
- ✘ The risk of becoming too technologically dependent – in the long-run it may become a barrier to their future expansion;

# Disadvantages to 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.

## 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

# Spin out Companies



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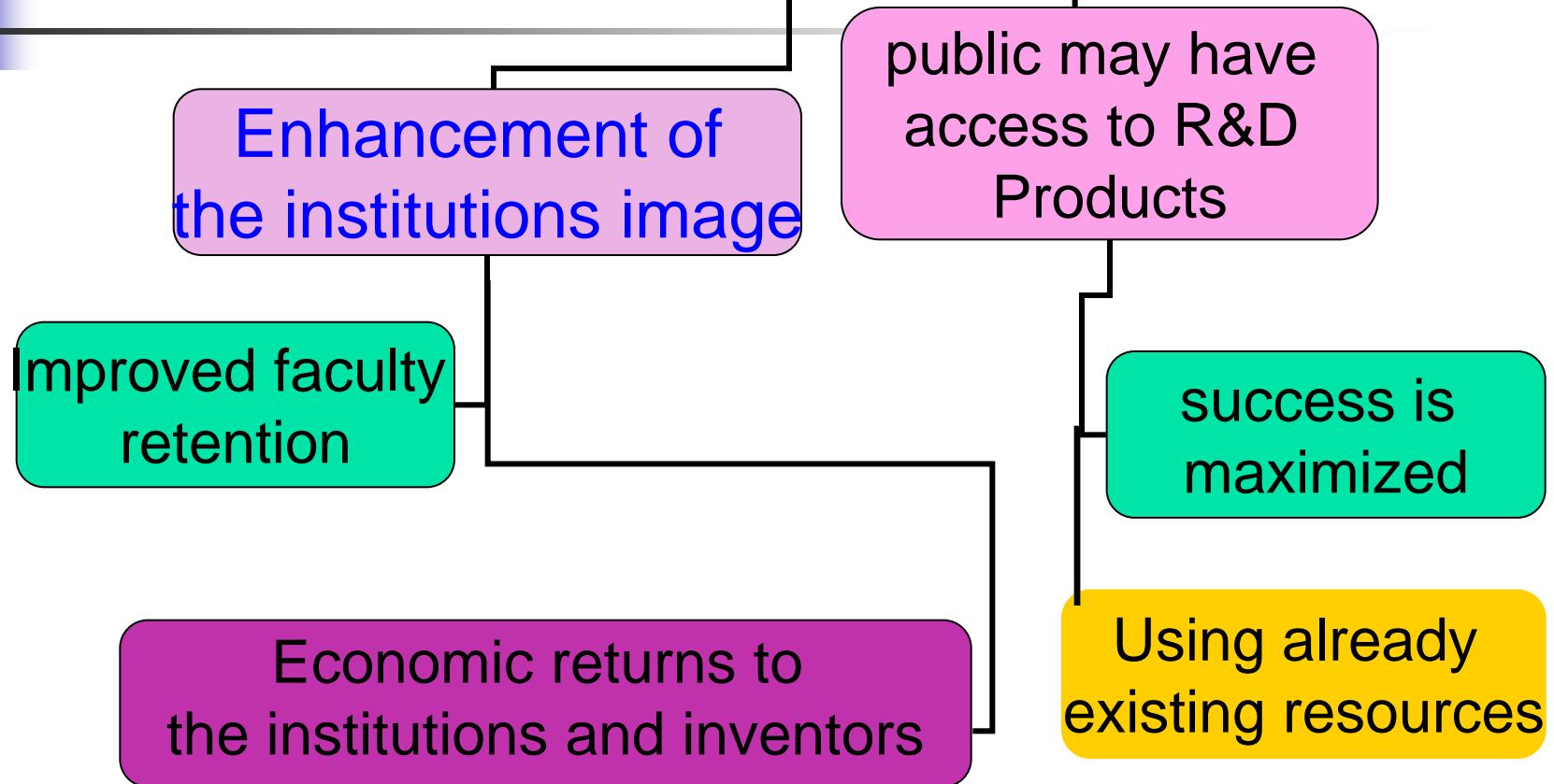
- The term university spinout refers to those companies that are formed around one or more faculty inventions, with involvement of the faculty inventors and cooperation of other staff.



# 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

# Advantages of Spin outs



# Start ups-VS- Spin outs

## 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





# Disadvantages of Spin outs

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- 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

# Examples of Institutional Spin Out Company

- 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
- Hewlette Packard in Silicon Valley have grown from spin out companies to major companies

# Examples of Institutional Spin Out Company

- 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

# Changing Trends

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

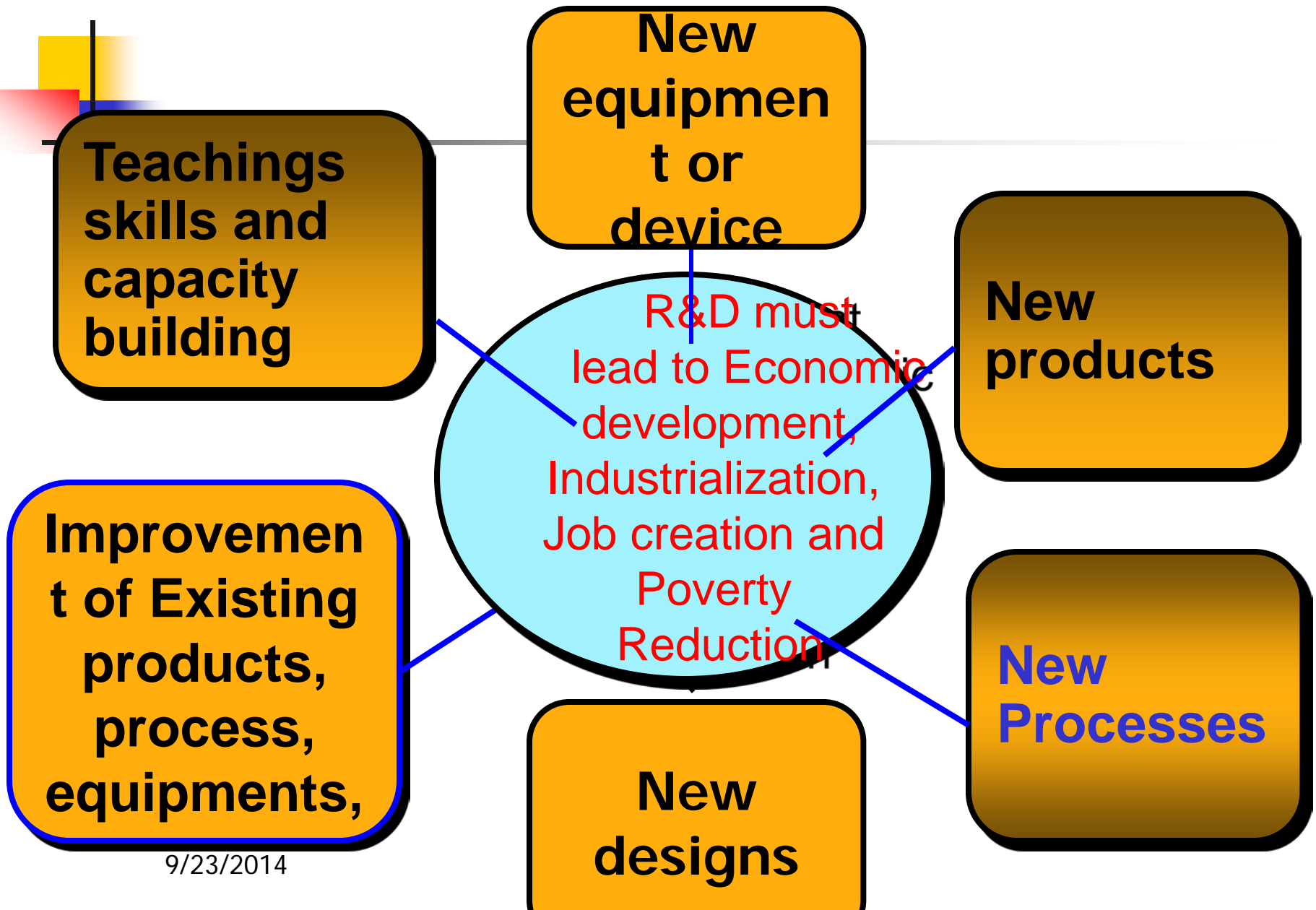
## 3.0 KIRDI R&D Strategy

### 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

For a long time KIRDI had concentrated on R&D with little emphasis on Technology Transfer to Industries

## 3.2. KIRDI's R&D Products





## 3.3. 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.

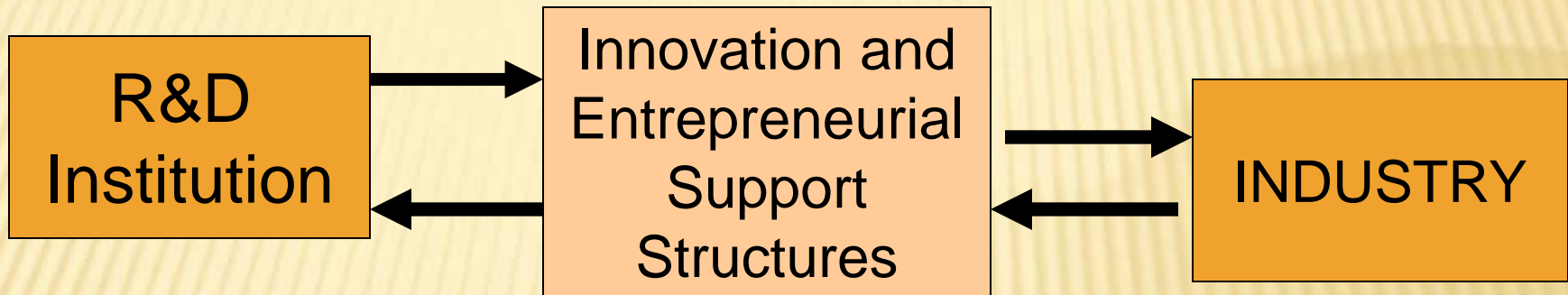


# 4. TECHNOLOGY TRANSFER AT KIRDI



- 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

## 3.4. 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

## 3.6. 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

# 3.7. Methods of Commercialization of R&D Products at KIRDI

## 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



# 3.9. Start Ups and Spin Outs Companies



**NYONGARA BIOGAS PLANT IN DAGORETI-NAIROBI**



# HONEY PROCESSING PLANT IN WEST POKOT





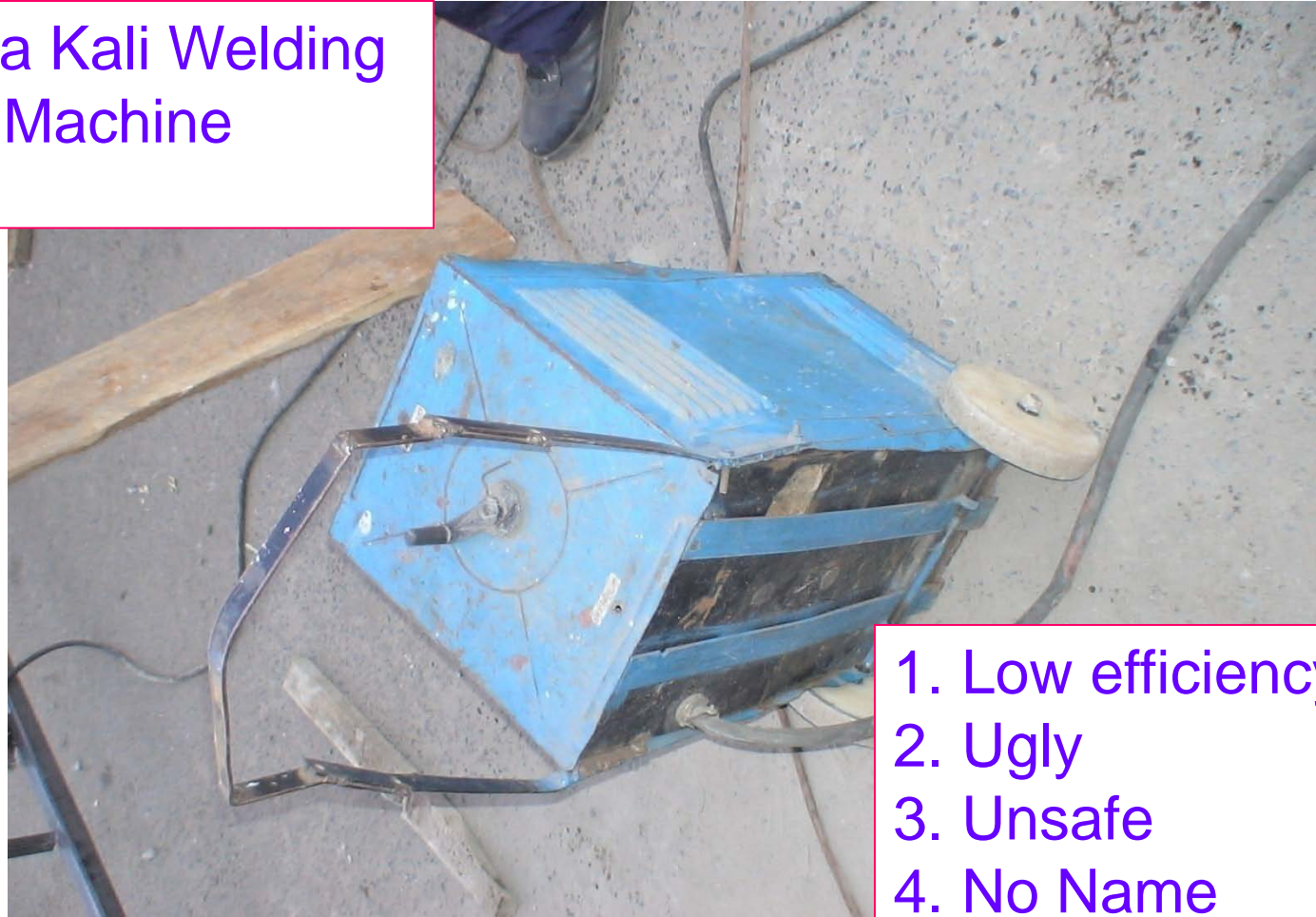
## 3.10. Common Manufacturing Facility



CMFs for leather SMEs at KIRDI and has supported more than 200 SMEs

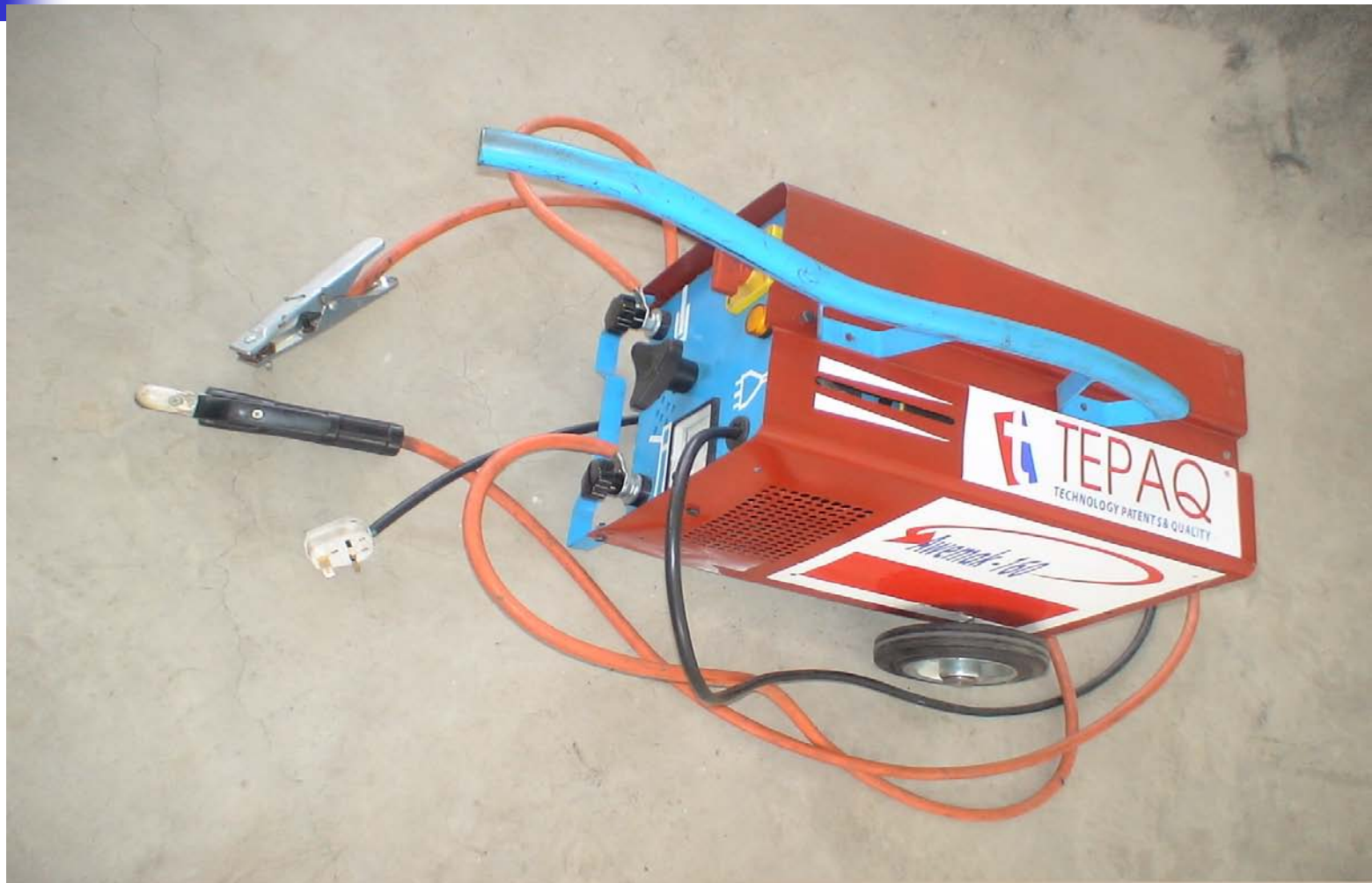
# 3.11. Prototype Development and Reverse Engineering

Jua Kali Welding Machine



1. Low efficiency
2. Ugly
3. Unsafe
4. No Name

# Prototype Development and Reverse Engineering cont...



# 3.13. 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

## 3.14. Current Situation in Kenya

- 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
- Private Investor in collaboration with university has established Business Incubation Facility

# 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

**Kenya Industrial Research and Development Institute,**

**South “C” Campus, Popo Road,**

**P. O BOX 30650 – 00100**

**Nairobi, Kenya**

**[rsmboya@yahoo.com](mailto:rsmboya@yahoo.com)**



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Development Institute**

