

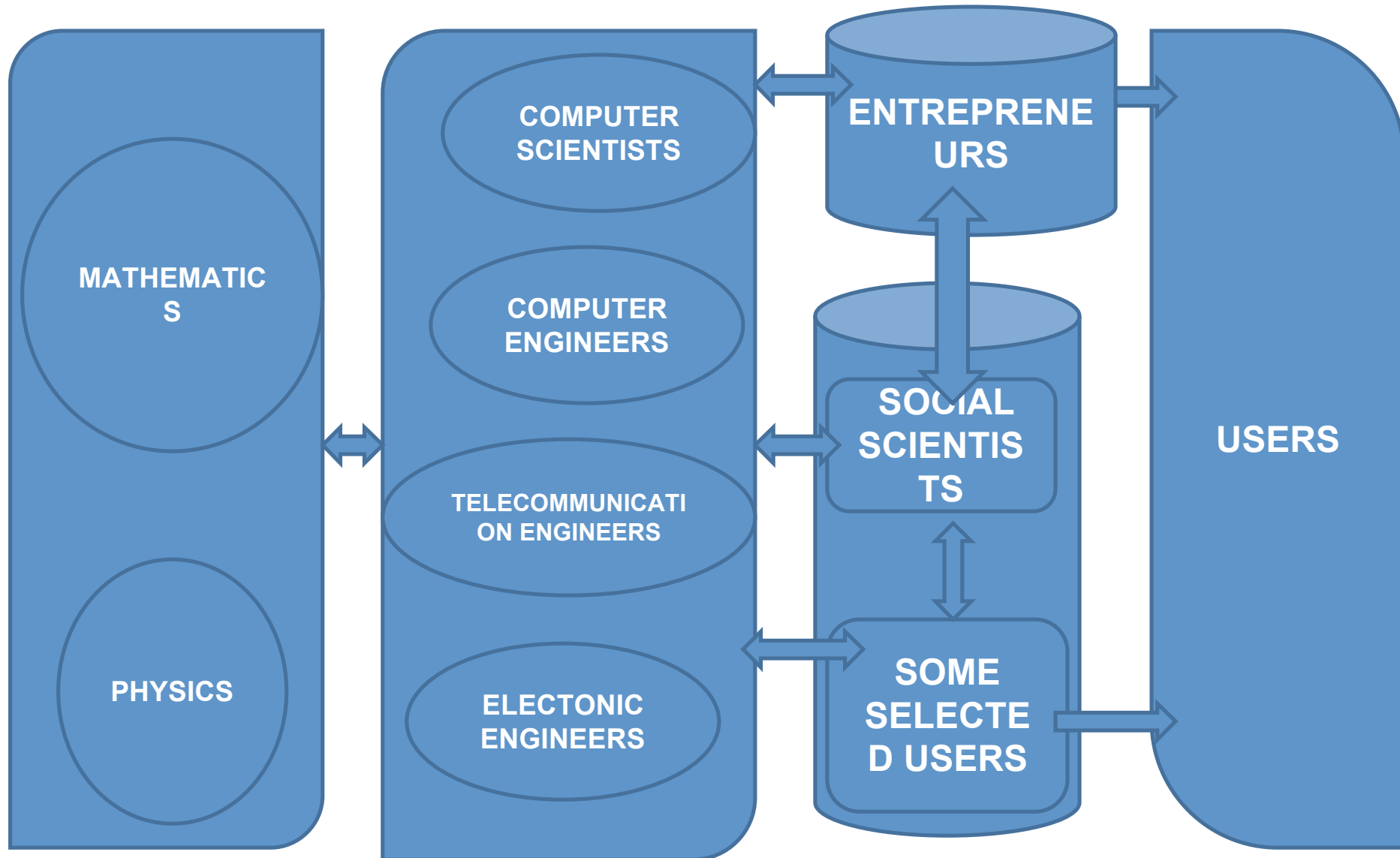
# **INFORMATION AND COMMUNICATION TECHNOLOGY RESEARCH CAPACITY IN CENTRAL AFRICA: THE CASE OF RWANDA**

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# OUTLINE

- **Introduction**
- **Capacity needs for ICT research and existing facilities in Rwanda**
- **Funding for Training and Research**
- **The role of ICT industries and organisations in research and capacity building**
- **Conclusions and Recommendations**

# Introduction



# Capacity needs for ICT research

- **Infrastructure**
  - **Universities and Higher Institutions**
  - **Research Facilities Existing in these Universities**
  - **Library Facility**
  - **National Laboratories**

# Existing facilities in Rwanda

## Universities and higher institutions

### – Public

- **National University of Rwanda (NUR)**
- **Kigali Institute of Education (KIE),**
- **Kigali Institute of Technology and Management (KIST),**
- **Kigali Health Institute (KHI),**
- **Higher Agriculture and Veterinary Institute (ISAE).**
- **School of Finance and Banking (SFB)**
- **National Institute for Statistics (NIST) of Rwanda**

# Existing facilities in Rwanda

## Private

- Adventist University of Central Africa (UAAC),
- Kigali Independent University (ULK),
- Kigali Lay Adventist University (UNILAK),
- Gitwe Institute of Education (IGSP),
- Kibungo University of Agriculture,  
Technology and Education (UNATEK),
- Kabgayi Catholic University (UCK) ,
- Butare Protestant Theological College,
- International college of Accountancy and Management  
(ICAM),
- Nyakibanda Major Seminary (INES),
- Byumba Polytechnic Institute (IPB),
- Rwanda Pentecostal University (UPR),
- Kigali Professional Institute (IESP)
- Kigali Institute of Management (KIM)

# Existing facilities in Rwanda

## KIST

Higher Institution	Faculty	Department	Fields of study	Level
<b>Kigali Institute of Science and Technology [1] (KIST)</b>	Faculty of Engineering	Department of Computer Science and Information Technology	Computer Science Information Technology	Bachelors degree in Science (BSc)
		Department of Electronics and Communications Engineering	Electronics Engineering Telecommunication Engineering	Bachelors degree in Science (BSc)
			<b>Communications Management</b>	<b>Masters degree in Science (MSc)</b>
			<b>Operational Communication</b>	<b>Masters degree in Science (MSc)</b>

# Existing facilities in Rwanda –

## RESEARCH GROUPS - KIST

The Department of Computer Engineering  
and Information Technology

- ❑ ICT for Sustainable Development,
- ❑ ICT in Education,
- ❑ Intelligent System and Pattern Recognition,
- ❑ Bio informatics,
- ❑ Geographic Information Systems
- ❑ Mobile Computing.

# **Existing facilities in Rwanda – RESEARCH GROUPS - KIST**

Department of Electrical and Electronic  
Engineering

- Signal Processing,
- Embedded system control,
- Chip level security systems
- Radio Planning and Optimization

# Existing facilities in Rwanda – NUR



Higher Institution	Faculty	Department	Fields of study	Level
<b>National University of Rwanda (NUR)</b>	Faculty of Applied Science	Department of Electrical and Electronic Engineering	Telecommunication Engineering	Bachelors degree in Science (BSc)
			Electronic Engineering	Bachelors degree in Science (BSc)
			<b>Information and Communication Technology</b>	<b>Masters degree in Science (MSc)</b>
		Department of Computer Science	Computer Science	Bachelors degree in Science (BSc)
	Faculty of Economics and Management	Department of Management	Business Information Technology	Bachelors degree in Business Information Technology
			<b>ICT Policy and Management</b>	<b>Masters degree in Science (MSc)</b>
<b>Centre for Geographic Information Systems (CGIS)</b>			<b>Applied Geo-Information Science</b>	<b>Post-graduate Diploma</b>

# Existing facilities in Rwanda – NUR - Laboratories

- **Mobile and Wireless (MoWiS)  
Laboratory:**

Simulation

- ❑ GSM and CDMA platforms,
- ❑ IEEE 802.XX wireless protocols.

- **Field Study**

- ❖ WiMAX network

# **Existing facilities in Rwanda – NUR - Laboratories**

## **Networking and Network Security (NNeS) Laboratory :**

- Cisco Certified Network Professional (CCNP).**

# **Existing facilities in Rwanda – NATIONAL - Laboratories**

- Geographic Information Systems  
Laboratory**
- Rwanda Development Gateway**

# Existing facilities in Rwanda – NUR - Laboratories

**Research in Open Source Software  
Systems Initiative Laboratory (ROSSSI)**

:

open source software

# Existing facilities in Rwanda

## Library Facility

- ❑ NUR and KIST have large collections of electronic journals in ICT in their libraries.
- ❑ There is also collaboration between the two institutions to share their library resources.
- ❑ Publications of the most popular engineering societies, for example, the IEEE and ACM

# Constraints

- **Personnel**
  - Few lecturers handling many modules
  - Dependence on visiting lecturers
    - Short stay
- **Funding**
  - Students have no support for tuition fees
  - Students have no support for subsistence allowances
- **Collaboration among the higher centres of learning**

# The role of ICT industries and organisations in research and capacity building

- ❑ Collaborative research between industries and universities
- ❑ ICT companies / Industries and organisations giving scholarships for research work at post-graduate level
- ❑ Post-graduate students interact with engineers

# Funding for Training and Research

- **Funding from ICT companies / industries to support training of students**
- **Post graduate theses works**
- Building research capacity in the country**
- Retaining of researchers and professors in the higher institutions**

# **Conclusions**

**Rwanda has the basic infrastructure for quality research and training high caliber researchers in the fields of ICT.**

# Recommendations

- ❑ The involvement of ICT organizations and industries in supporting research and post-graduate training will promote capacity building for sustainable development
- ❑ There is the need to devise appropriate strategies to attract and retain qualified and experienced personnel at the universities and research institutions.

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