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## Implementation of Joint Funded ICT Infrastructure Projects for Digital Acceleration and Youth Empowerment. The Case of NRF-Kibabii University

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and Data Centre.  
Youth Empowerment.

Kibabii University is the 23<sup>rd</sup> Public University in Kenya and is committed to high quality teaching, research, and extension services to create value to her stakeholders. The University considers Information and Communication Technology (ICT) as its flagship programmes and purposes to be a Computing Research and Innovation Centre (CRIC) /hub in East and Central Africa. The vision of the University is to be a global University for Research, Innovation and Technology. To achieve this, it requires improved ICT infrastructure to enhance digital acceleration and empowerment of the Youth. High Performance Computing facility was required to enable students and researchers perform simulation and modelling. Other facilities required were: mobile computing, digital forensics, CISCO professional laboratory, and video conferencing and data centre. To achieve this the University required funding beyond its normal capitation. To raise the additional funding the University responded to a call for Funding by National Research Fund. After approval and disbursement of the funds the implementation of the Project was initiated. An engineering design approach was adopted. This paper highlights some of technical issues that were faced during the Implementation of the projects. The project was successfully implemented and Commissioned by the joint team. It awaits fully exploitation for benefits of job creation and youth empowerment.

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**INTRODUCTION**

The School of Computing and Informatics at Kibabii University though a young university has established itself as an emerging centre of excellence in computing. It is putting in place all necessary manpower to increase research and innovation to produce trained graduates that can compete nationally, regionally, and internationally. The challenge to fully achieve its goal of producing the said graduates is infrastructure to support the manpower in the training (Mbuguah et al. 2022a & Mbuguah et al., 2022b). Information Technology is a flagship programme for the University and the School offers Information Technology and Computer Science at both undergraduate and postgraduate levels. In order to compete with the rest of the world in this field, the School of Computing and Informatics main agenda has been to ensure the curriculum is current as well as address the current and emerging trends in technology. To raise the necessary funds required for the infrastructure the University adopted a strategy of raising funds

through responding to calls, NRF being one of them (Kibabii University, 2020)

**PROJECT DELIVERABLE, OBJECTIVES AND MILESTONES**

In this section we address the issue a project deliverable, objectives and, milestone

**Project Deliverable**

A "Deliverable" can be defined as the physical evidence of what has been produced through an activity or as the physical evidence/support of the output that was produced through an activity. Each activity should include one or more deliverable that contribute to the achievement of project outputs. All steps of a single activity do not necessarily need to be listed as separate deliverable, but should be aggregated into one deliverable when applicable and relevant (Interreg, 2023).

For this project, the team identified the deliverables which were used as milestones in the implementation of the project as shown in *Table 1*.

**Table 1: Project Deliverable**

| Main deliverable                    |               | Sub-deliverable   |
|-------------------------------------|---------------|---|
| Data Centre                         |               | Assigned room for data centre<br>Equipment for data centre  |
| Digital Laboratory                  | Forensic      | Assigned lab for digital forensics<br>Basic digital forensics equipment<br>Training of experts in digital forensics   |
| E-Learning and Conferencing         | Video         | Basic video conferencing equipment<br>Customer configured interactive learning platform<br>Trained staff in digital content development<br>Digital content for 40 units |
| Mobile Laboratory                   | Computing     | Assigned laboratory for mobile computing<br>Basic equipment for mobile computing and artificial intelligence  |
| Professional Preparation Laboratory | Certification | Assigned laboratory for certification programmes<br>Basic equipment for certification programmes<br>Professional certification programmes                               |
| Incubation Centre                   |               | Assumption Incubation room / workshop a platform for software development registration of business start ups  |

## Objective

The main objective was to deliver the main deliverable and other sub objectives were to deliver other sub-deliverable so as to enhance digital acceleration and youth empowerment.

## Project Milestones

For the purpose of project monitoring the following milestones were set:

### Advertisement of Tenders

Kibabii University being a public institution that is funded through public monies is required to have a transparent procurement process as guided by the Public Procurement and disposal act as well as in the public procurement and disposal regulations (Treasury, 2020). The act also states that the invitation for tenders and awarded tenders should be uploaded on the University website and this was done (Webmaster KIBU, 2023).

### Evaluation of Tenders

As per the procurement assets & disposal act and procurement assets & disposal regulation an evaluation committee was constituted and appointed by the Vice Chancellor. The Mandate of the committee was to evaluate the proposals from bidders based on a set criterion. The evaluation did start by evaluating whether the tenderer had all the mandatory documents failure to which the tender was deemed as being non-response and was rejected. The tenderer were informed of reason for being non-responsive. The responsive tenderers were then evaluated for technical requirement and awarded as score in the ranges of 0 -100 %. Those who scored 70% and above proceeded to next stage of financial evaluation. The Financial evaluation verification of accuracy of the financial figures. The total cost was then expressed as percentage compared with university financial estimate of the project. The final score combining both technical and financial score was then determined as  $= 0.8 * \text{Technical Score} + 0.2 * \text{Financial score}$ . The evaluation committee then ranked the tenderer and the best ranked was recommended for award of tender.

## Award/Contract Signing

The procurement officer on receiving the recommendation from the evaluation committee wrote to the Vice Chancellor expressing her opinion on the same. The winning tenderer was then informed and on acceptance of the offer signed the contract with the University.

## Project Implementation Committee

A project implementation committee took over the supervision of the implementation. They held meetings regularly to monitor progress and solving any emerging issues. Some of emerging issues were: delayed implementation of project and extra works needed to be done.

## Site Handover

The site handover was done in two stages i.e.:

- Client to vendor over site over; In Client to vendor is where the vendor was the tenderer and signed the document he was shown around and the site handed over to him. The site handover and handover process, is confined to ensuring that live services are suitably identified (Webmaster Imperial, 2023). This meeting was also an opportunity for KIBU team and the contractor to discuss and agree protocols for service isolation and how they will work together; to ensure all service issues are adequately managed and to avoid any unplanned service disruptions.
- Vendor to client handover: In Vendor to Client handover the Client accepts the completion of the project. After which the contractor can leave the site and client takes over the site. For this to happen the Implementation committee, ICT staff and representative of vendor evaluated each item of equipment and verified that it was working as stated. The committee then recommended that the University accept the project. The handover was phased as each the labs was completed it was handed over. The Vendor was then issued with certificate of completion. He was paid 95% of money

accrued but 5% was retained to be paid after zero defect period of six months.

**Commissioning of the Project**

The commissioning of project was done jointly by the University CEO and the CEO of NRF who were the core sponsors for the project. But before the commissioning, officers from NRF had visited the University for monitoring purposes. They also required progress and financial reports sent to them when requested for. A team of auditors were dispatched from NRF to do accounting of how the funds were spend since it is government money as per public finance management act (2020). The project was also audited by the Kenya National Audit organization (KENAO). The Auditor general indicates on their website that audit services and audit reports are critical in monitoring and evaluating the outcome and impact of the management and use of public resources, and providing valuable information on whether we as a country are achieving our developmental priorities and service delivery objectives (Gathungu, 2023).

**Training of Staff and Module Development**

After completion of the project the staff were trained on the working of facilities. Further training was done to staff on digital forensic to allow the staff prepare to teach and demonstrate to students on the working of equipment. This was done by Cyber roam -Africa. Which is an organization that offers both comprehensive cyber security training and specialized professional development such as

Digital Forensics & Investigation Training to guarantee trainees have the very best cyber security skill-set (Mutunga ,2023).

**RESULTS OF THE PROJECT IMPLEMENTATION**

The result considered technical aspect of project delivery and financial matters.

**The Expected Project Deliverable**

These were: The Data Centre, Video conference, Mobile computing laboratories, Professional Cisco laboratories and Digital forensic. These were delivered and commissioned. Proposal on how to best utilize the equipment not only by the University but the general is being discussed and at final stage. There is draft policy on ways on commercializing the hub.

The MSc program in Digital Forensic has been approved based on the equipment. The program is being implemented and the University has been declared as centre excellence in ICT and Engineering for the Lake Region Economic Block (LREB) that was established in 2015 as an economic bloc to enable the counties to leverage economies of scale, and facilitate the development, management, and utilization of cross boundary economic resources and infrastructure (Nyagaya, 2023). Further program such as a program in bachelor degree in digital forensic and security is in the pipeline.

**Financial Matters**

During the proposal development towards the partner contribution are as listed in *Table 2* below.

**Table 2: Funding**

| Item              | Partner contribution |               | Total          |
|-------------------|----------------------|---------------|----------------|
|                   | Kibabii Univ.        | NRF           |                |
| KITCH grand total | 125,314,228.00       | 88,167,974.00 | 213,482,202.00 |

The Team had proposed that the NRF were to provide KES 88,167,974.00. However, after award of contract NRF provided funding of 64.6 M. This necessitated a review of the proposal to downsize it so as to work with new figures. Tenders and contracts were then awarded based

on the new figures. During implementation, as per requirement of the data centre such as excellent air cooling, there was need for extra works (Mungai et al. 2022). The cost of the extra work is shown in *Table 3* below.

**Table 3 Budget for Extras works**

| <b>Tender</b>   | <b>Description</b>  | <b>Committed Amount (Ksh)</b> | <b>Total Ksh</b> |
|---|---|-------------------------------|------------------|
|   | <b>BUDGET Amount</b>  |                               |                  |
| Extra works on Data Centre that involved supply of equipment, electrical works, and civil works | Additional Electrical works to supply the data centre with Three Phase power supply from the Generator room | 1,600,000                     |                  |
|   | Fireproof door for data centre  | 310,000                       |                  |
|   | Civil Partitioning inside the data centre   | 550,000                       |                  |
|   | Precision air Cooling System  | 1,735,000                     |                  |
|   | Raised Floor for Data Centre  | 120,000                       |                  |
|   | Sub total   |                               | 4,315,000        |

The approval for extra work was sought from the Vice Chancellor as per Public Procurement and Asset disposal Act (Treasury 2020). The payment of dues to vendor was strictly adhered to as per Public Finance management Act (The Republic of Kenya, 2020) and Public Finance Management regulations (Kenya Law 2015). Proper record of accounts was maintained by the Finance department for duration of the project. The Finance department ensured that money was ring fenced and not used for any other purpose as per requirement of awards of funds.

### Risks to the Project

The major risks were:

- COVID-19 resulted in global lock down that caused a delay in the implementation. This was because of the fact that some of the equipment were outsourced from India and United States of America (Tan 2020).
- The Ministry of ICT provided framework for procurement that required Government to procure there equipment via vendors approved by the Ministry. Most of the items required to be imported and most of approved suppliers by the Ministry of ICT could not do. This caused a delay and re advertisement for tenders. Plus, some of the specifications of the items were beyond what the approved supplier could supply (State Department of ICT, 2020)
- Tenders were won by vendors who had no ability to deliver requiring re-advertisement. Most tender provided financial statement

indicating that they are financially able but this proved to not the case. Others requested for renegotiation of the contract so that they could be paid a certain percentage on delivering equipment for a given lab. They argued that the released money could enable them order equipment for the other labs.

- Procurement department not having handled NRF projects. Since the requirement were slightly different, it was also learning experience for the staff in the department. Time was lost as staff consulted on the right process and procedure. At end of the day, the procurement department was better placed to handle such a project in future
- Security of equipment; since some of the rooms were not build from the basic as laboratories, converting the same into laboratories required them to have reinforced doors and windows. There was extension of CCTV networks within the Laboratories to enhance security. There was also need for networking within the rooms.

### Administrative Reflections

The project was implemented through a project implementation committee. There was need to give letters to committee on time. Another administration issue was the committee and University administration acted rather slowly in canceling tenders for vendor who kept promising delivery but could not deliver. The University should be swifter in canceling tenders to non-performing vendors. There is need for background



check on the vendors to ensure they had the financial and technical muzzle to deliver.

## CONCLUSIONS AND RECOMMENDATIONS

The KIBU delivered on the project as envisioned despite the many challenges faced. The KIBU team have now the necessary experience to implement such projects. The students and country at large are set to benefit on utilization of the equipment.

The University should set up a team to see how the facility could be fully exploited and commercialized. The University should draft policies to guide the sharing of the equipment by other interested parties. The University should market the facility for more visibility. More programs should be developed to exploit the facilities. The facility is set to lead to job creations and youth empowerment.

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