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The Use of Smart Technology Solutions to Mitigate Against Revenue Collection Challenges in African Electricity Distribution Utilities

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1. Introduction

Most of the African electricity distribution utilities are state enterprises required, to a large extent, to provide social a service and minimal profit if any. Governments are more interested in providing universal access without giving much consideration on sustainability of electricity distribution and supply. African Governments are also striving to achieve the **Agenda 2063** one of whose key objectives is "*to harness the continents endowments embodied in its people, history, cultures and natural resources for development*". Electricity has now become a political weapon of power.

While innovation diffusion for the first and second industrial revolutions were rather slow, the third industrial revolution moved at a relatively fast rate. It is expected that the fourth industrial revolution will even be much faster, hence electricity distribution utilities need to remodel their businesses to take full advantage of the emerging revolution to maximize revenue collection.

2. Challenges in African Electricity Distribution Utilities

a. New technologies are not packaged to provide smart solutions, hence increasing non-technical losses due to undetected theft, vandalism. Split prepaid meters, when used as discrete units, are still prone to bypasses. While metering solutions have become smart, but their inherent deficiency in **intelligence** has made them easily prone to manipulation just like their predecessors. Emphasis may currently be based on excitement for new technologies rather than effective solutions.
b. Slow maturity of smart metering technologies for large power users resulting in challenges to mitigate against non-payment of huge bills by Government and quasi-Government Departments.
c. Non-supportive legal framework

d. Ineffective energy policies and challenging business environments created by Governments maximising provision of social services at the expense of sustainability of electricity distribution utilities.
e. Non-cost reflective tariffs to appease the populace.
f. Archaic business management models used in Distribution utilities
g. Poor resource management and asset management approaches
h. Persistent power shortage

3. Importance of Smart Technologies

While it is extremely difficult for State owned enterprises in most parts of Africa to achieve ***cost reflective tariffs***, ***power adequacy*** and ***negative political influence***, Smart Technologies should help to bridge the gap to ensure sustainability of the distribution business under prevailing circumstances. It is therefore important that the electricity Distribution businesses should take advantage of the 4th Industrial Revolution (4th IR) to maximize aspects of the business under their control. This can best be achieved through maximization of deployment of smart technologies in the entire value chain of the electricity Distribution business. Three aspects that Distribution businesses can leverage on through deployment of smart technologies are;

a. Smart technologies in provision of efficient customer services by making full use of the internet of things environment, e.g. *energy credit sharing*.
b. Smart revenue management by maximizing intelligence of smart metering systems, for example, through ***continuous theft detection*** and ***energy balance capabilities***.
c. Smart Asset Management through the life cycle.
d. Smart Business Management and supportive legal framework to maximize efficiency.

4. Conclusion

If electricity Distribution Businesses are going to fully embrace the benefits of emerging technologies to maximize revenue amid various challenges that cannot be resolved in the short term, emphasis should now move from ***technologies*** to ***packaged* solutions** as is the current focus on Internet of Things (IOT) in this Fourth Industrial Revolution environment.

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