Towards building smart energy systems in sub-Saharan Africa: A conceptual analytics of electric power consumption

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Author(s)
Temitope M. John ; Emeka G. Ucheaga ; Olalekan O. Olowo ; Joke A. Badejo ; Aderemi A. Atayero
View All Authors
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Abstract

Abstract:
A fast emerging source of knowledge acquisition through inference from available data is analytics. The convergence of maturity, ubiquity and ease of deployment of Internet of Things (IoT) enabling technologies has engendered this possibility. The need to leverage on available data from credible sources to develop sustainable systems within the smart and connected communities (SCC) paradigm cannot be overemphasized. In this paper, the architecture of an IoT-enabled smart micro-grid system is proposed to harness the potentials of emerging independent power projects in sub-Saharan Africa. As a case study, this paper examines the interrelation between the economy and electric power consumption in Nigeria, Africa's energy giant and most populous nation, from 1981 to 2014 using the off-the-shelf IBM Watson analytics software. The predictive analytics tool provided an in-depth analysis of the determinants of energy-driven economic growth, as a basis for developing a sustainable smart energy system in Nigeria. Insights gained from this predictive analytics afford private investors, policy makers, consumers and other stakeholders an opportunity to work together to meet the increasing demand for energy production in sub-Saharan Africa.

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I. Introduction

The development of reliable and efficient energy systems is crucial for sustainable development in any nation. The per energy consumption is an indicator of the per capita income and prosperity of the nation. Universal access to reliable, adequate and cost-effective supply of power for domestic, commercial and industrial use in a country, no doubt increases productivity, job creation and fosters economic growth resulting in improved living conditions of the residents [1] [2].

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