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Utilizing Analytics to Assess the Sustainability of Telecommunications in Developing Nations

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Abstract

The relentless pace of globalization is a critical factor to consider in the business world. Employees are exposed to ever increasingly culturally diverse workforces. Since an individual's emotions are greatly influenced by culture, how one copes with and manages emotions differ largely based on one's ethnic and national background. That can be extended to include how one manages others. That is, a manager's consideration of specific, culturally patterned emotional expressions and behaviors of each member in their workforce has been found to correlate directly with the efficacy of administrating people of varying cultural backgrounds. In short, this study builds on previous research showing that emotional intelligence (EI), also known as emotional quotient (EQ), depends on national culture and reports data acquired to assess the causal relationship between EI and professional achievements such as salary and job position, as well as other demographic variables such as education level, age and gender.

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1. Introduction

Developing countries have been in the process of considering transforming their infrastructure to be partially or fully liberalized as a means of economic and social development for some time. This includes the infrastructure that provides power, water, and other basic needs as well as infrastructure that provides services society demands, e.g. telecommunications. The decision itself to undergo reform in the public sector is only the beginning of a long, complicated process. Managers, engineers, policy makers... all stakeholders must understand that the introduction of reform must be accompanied by a thorough understanding of the sector’s needs, demands and different environments, e.g. social, political, economic or technological. The discipline of analytics provides a means of assessing complex situations such as the liberalization of public infrastructure in order to predict how a sector will react to such changes.

The primary goal of this research was to build a model that comprehensively incorporates different issues that affect a sector’s sustainability over time. The intention was to build a model that could be used to run simulations that produce snapshots of the overall sector that could be evaluated to assess the impact of various changes that have been introduced, or to explore the potential effect of proposed changes on the overall sector. In this way the model could be used as a predictive tool to evaluate proposed changes, e.g. sector reforms such as privatization.

The process of building the model was broken down into five major steps as shown schematically in Figure 1, along with the steps for validation.

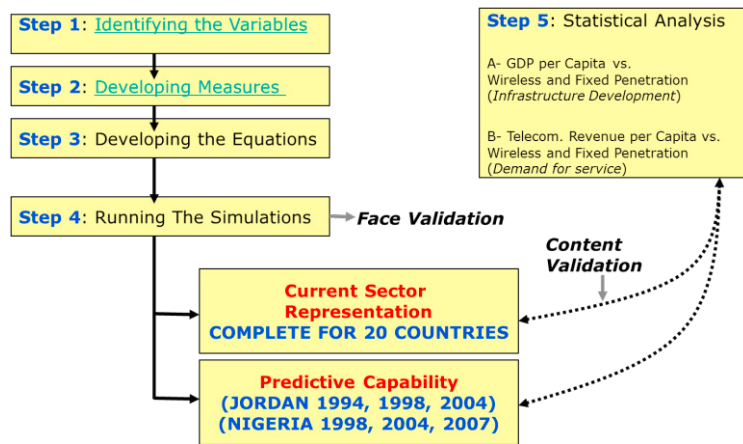


Figure 1. Flowchart of the Model Development Process

Although it took considerable time to develop and validate the model, the largest amount of time was spent considering what it means to be sustainable. In the end the choice was made to define sustainability by incorporating the concepts of supply and demand where, in the model, supply is defined in terms of infrastructure development and demand is defined as the demand for services. The overall model was kept generic throughout its development so that it could be applied to other complex situations and/or other sectors such as power or water. It is comprised of a set of two linear equations, one representing supply and one representing demand, developed using the tenets of systems engineering. The value, or score, representing infrastructure development includes both existing infrastructure and infrastructure under development, i.e. infrastructure that is beyond planning and is actually under construction. The score representing telecommunications demand is really a measure of how well service requests by users, or customers, are being met. In this case, ‘service request’ means a request for connectivity rather than other types of requests such as a request for repair. Using this definition, telecommunications demand can be quantified by evaluating the revenue per capita generated by the telecommunications sector in a particular country.

In addition, a significant amount of time was spent in determining which variables are required to comprehensively model a public service sector. Variables were identified through a literature review of the various issues affecting a sector. Because this study was not just limited to ‘issues’ but included virtually everything that can impact a sector the entire set of things that can effect a sector is referred to as ‘elements’. And, because the number of variables

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