

# Chain Management Practices in Brazil's Electrical/Electronics Industry Using Interpretive Structural Modelling

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## Description

Contrary to conventional wisdom based on the product cycle and technology gap models, this paper argues that the technology factor can prove to be a key determinant of manufactured exports from less-developed countries (LDCs). The technological advantages enjoyed by LDCs rest on a very different foundation, technological capability, rather than on major technological advancements or breakthroughs. This paper attempts to capture and analyse how technological capability augments export competitiveness of LDC enterprises by introducing quantifiable concepts of technological capability and estimating econometric models of firm-level export performance for two R&D-intensive industries in India, pharmaceuticals and electronics/electrical. The results of our econometric analysis provide new insights into the relationship between technological capability and export performance, highlighting significant inter-industry differences. We find that simple production engineering capabilities augment exports of both sectors, while efficiency of reverse engineering proves to be particularly important for pharmaceutical exports only.

## Electric Power

Today, technology is characterized with speed and consistent improvement concepts. The speed of this change and improvement causes devices out of date in a short time, and creates a new waste type related waste piles growing every day. Management of these wastes is critical both for their economic values and raw material sustainability; however for a rational sustainable waste management, we have to determine the amount of waste at first. Although it is known that massive amounts of e-waste are being generated worldwide, in a lot of countries there are no reliable results about these amounts. The potential of the communities generating e-waste changes depending on their technological tendency, life standards and especially for developing countries, scrap export. Half of Turkey's population is younger than 30 and the country has a big group of potential technology users. There are nearly 67.7 million mobile phone subscribers countrywide. Besides, 47.2 % of the households have internet access, 58.9 % have computer, 90.77 % have television, 98.66 % have refrigerator and 95.06 % have

washing machine. This study tries to explain the technological familiarity of Turkey's population and their technological product possession together with related e-waste production potential. Study also calculates the estimated e-waste amounts raised by years. Electrical and electronic components are very important subcomponents in modern industrial wind turbines. Complex multimegawatt wind turbines are continuously being installed both onshore and offshore, continuously increasing the demand for sophisticated electronic and electrical components. In this work, most critical electrical and electronic components in industrial wind turbines have been identified and the applicability of appropriate condition monitoring processes simulated. A fault tree dynamic analysis has been carried out by binary decision diagrams to obtain the system failure probability over time and using different time increments to evaluate the system. This analysis allows critical electrical and electronic components of the converters to be identified in different conditions. The results can be used to develop a scheduled maintenance that improves the decision making and reduces the maintenance costs

## Power Electronic Converters

CuO thin films with different levels of compositional deviation from 50:50 stoichiometry have been fabricated using radiofrequency sputtering deposition wherein the sputtering gases consisted of oxygen and argon in various proportions. The microstructures of the thin films were characterized by combining a series of advanced methods including X-ray diffraction, energy dispersive X-ray analysis, scanning and high-resolution transmission electron microscopy, electron energy loss spectroscopy, and high-resolution X-ray photoelectron spectroscopy. The results showed that the chemical states of Cu and O in the thin films depended upon CuO composition and sputtering conditions, so that different levels of Cu vacancies dictated the electrical/electronic properties of the thin films. The ability to control the compound composition and associated alloying chemistry enables tuning of the concentration and mobility of holes in CuO, hence creating low-cost and environmentally friendly semiconductor from abundant materials. This offers an essential technical basis in engineering photonic devices such as pn or Schottky diodes, thus opening

new avenues for economic harvest of solar energy using diodes solely based on sustainable oxides. Industries need to adopt the environmental management concepts in the traditional supply chain management. The green supply chain management (GSCM) is an established concept to ensure environment-friendly activities in industry. This paper identifies the relationship of driving and dependence that exists between GSCM practices with regard to their adoption within Brazilian

electrical/electronic industry with the help of interpretive structural modelling (ISM). From the results, we infer that cooperation with customers for eco-design practice is driving other practices, and this practice acts as a vital role among other practices. Commitment to GSCM from senior managers and cooperation with customers for cleaner production occupy the highest level.