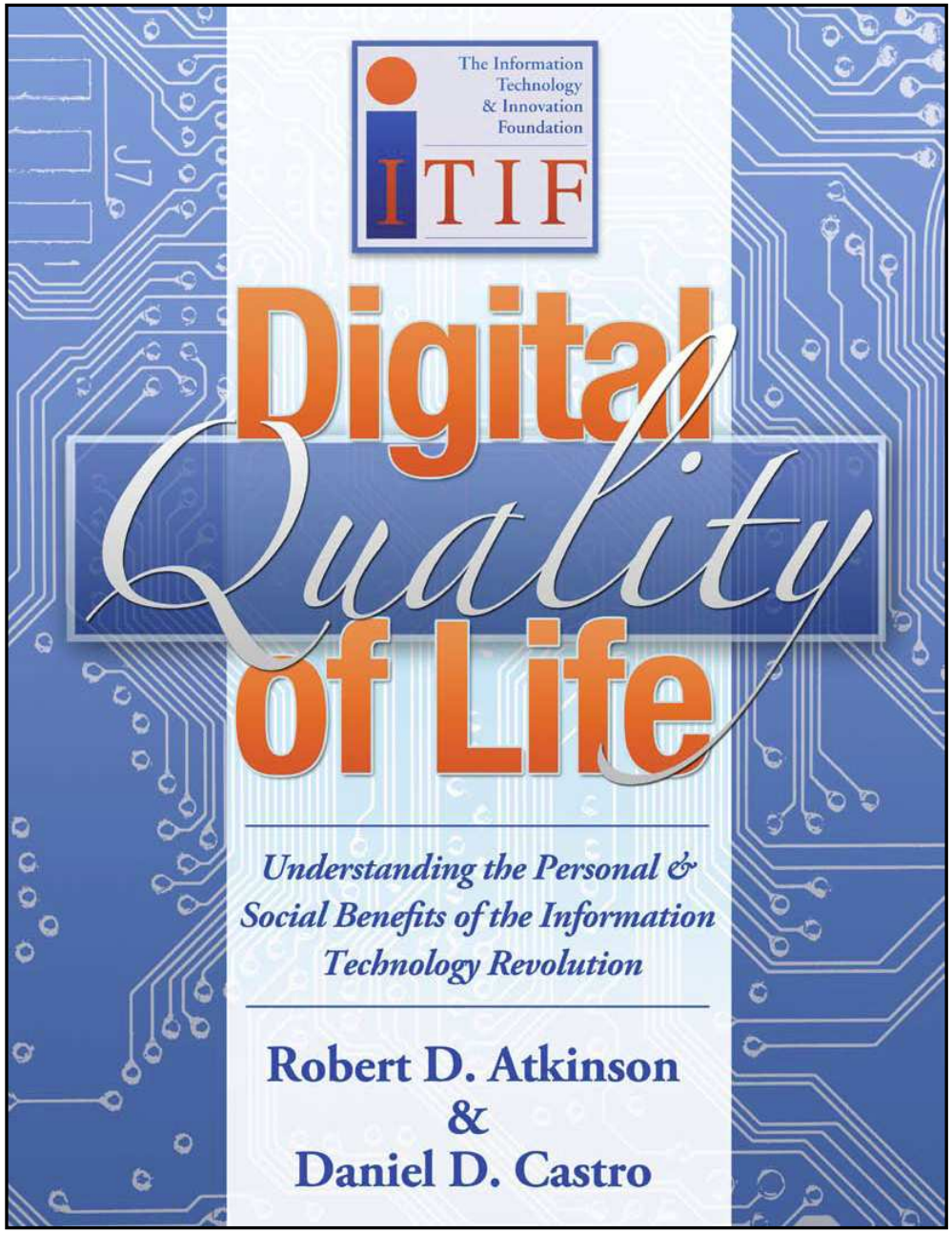


"The Impact of IT on Energy"

Washington, DC

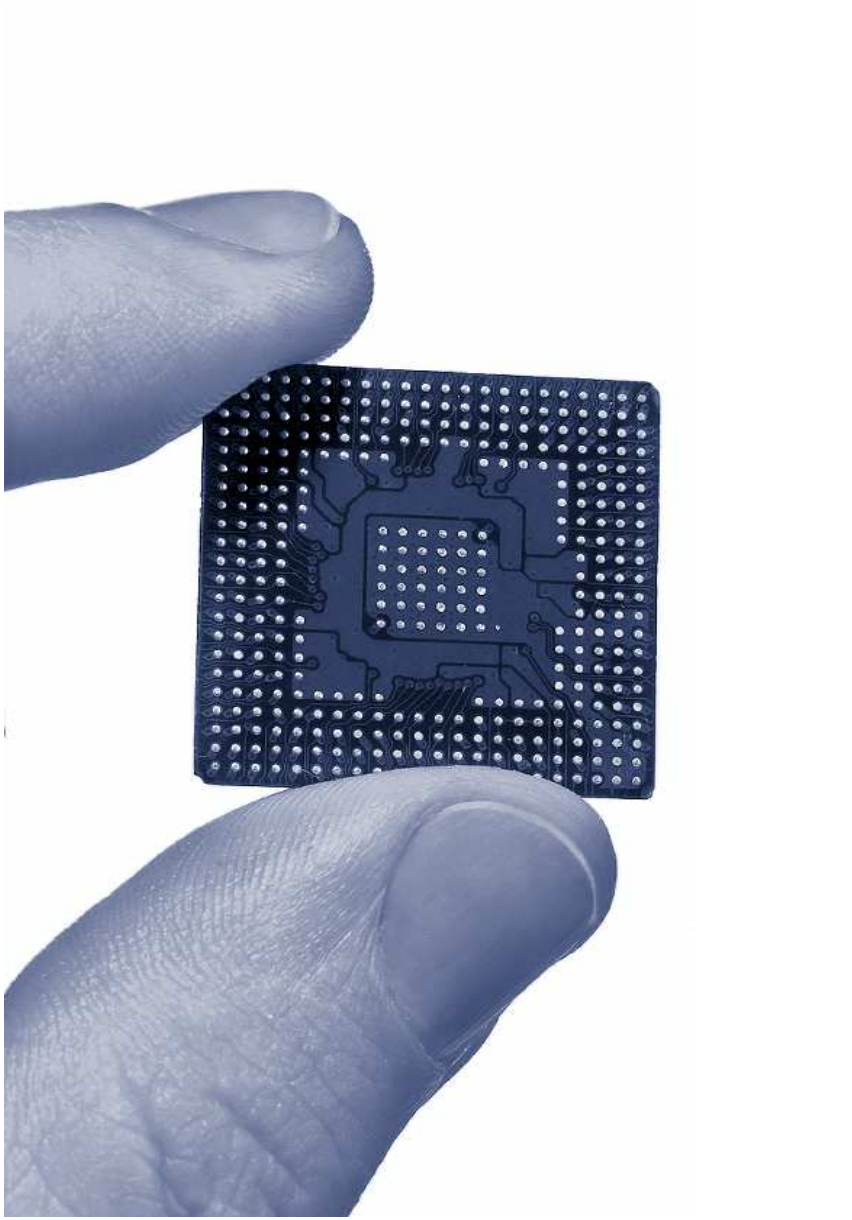
November 17, 2008

Daniel Castro

Senior Analyst

The Information Technology and Innovation Foundation

The Digital Information Revolution



The Information Technology & Innovation Foundation

ITIF

Digital Quality of Life Presentation
October 2, 2008

Substituting Virtual for Physical

- Dematerialization
  - Substituting bits for atom
  - Eliminating all CD & CD case production would save:
    - 42 million gallons of oil per year
    - ½ million tons of greenhouse gas emissions
  - Reading the news online
    - Newspaper circulations have dropped with rise of online news preventing 7.9 million tons of greenhouse gas emissions

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Substituting Virtual for Physical

- Telework
  - In 2006, 5.4 million people worked at home/teleworked
  - In 2007, teleworkers saved 840 million gallons of gasoline; reduced carbon emissions by 14 million tons
  - If additional 10% of workforce teleworks in next 10 years, U.S. would save 3.3 billion sq. ft of office space (reducing greenhouse gas emissions by 28.1 billion tons)

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Substituting Virtual for Physical

- Videoconferencing
  - Reduce air travel for business meetings
  - If Europeans substituted videoconferencing for 20% of air travel, EU could reduce CO2 emissions by 22 million tons annually

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Energy-Efficient Processes

- Logistics and Travel
  - Reduce unnecessary inventory
  - Increase seat utilization of air travel
  - Optimize freight movement
    - In 2006, UPS reduced truck travel by 28.5 million miles using better software
  - Personal travel

Energy-Efficient Processes

- E-Commerce
  - Energy in selling $100 of books in a retail store is 14 times higher than an online bookstore
  - A comparison:
    - 20-mile round trip to mall to purchase two 5-lb product consumes 1 gallon of gasoline
    - Shipping the packages 1,000 miles by truck consumes only 0.1 gallons of gasoline

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Energy Production & Consumption

- Energy Production
  - Wind
    - Optimize blade angle for maximum efficiency
    - Wind farm modeling
    - Integrate with electrical grid
  - Solar
    - Automated solar panels maximize exposure to sun

Energy Production & Consumption

- Smart Grid
  - Advanced Metering Infrastructure
  - Grid Visualization
    - If the grid were just 5% more efficient, the energy savings would equate to permanently eliminating the fuel and greenhouse gas emissions from 53 million cars.
  - Distributed Generation
- Green Buildings

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Reducing IT's Use of Energy

- Data Centers
  - Virtualization
  - Better cooling
- PCs
  - Power management

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What is the Net Impact?

- Reduction in energy intensity
  - From 1996 to 1999, U.S. had a 3.2% reduction in energy intensity
  - For every unit of energy consumed by IT, corresponding savings of 6-14 units of energy

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What is the Net Impact?

- Reduction in energy intensity
  - IT could reduce expected growth in carbon emissions by 1/3 over 10 years (Lawrence Berkeley National Laboratory)
  - More widely adopted broadband networks could result in net reduction of 1 billion tons of greenhouse gas emissions over 10 years
  - Japan–IT could cut carbon emissions by 40% by 2050

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Public Policy Principles



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Public Policy Principles

1. Look to Digital Progress as Key Driver of Improved Quality of Life
2. Ensure Widespread Digital Infrastructure
3. Lead by Example

Also, Innovation-Based Economic Stimulus Package

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Full Report Available At:

www.itif.org

Questions?

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