

INSPIRING our LEADERS of TOMORROW

IEEE Standards Association (IEEE-SA)

The Role of Standards in Economic Growth in
Developing Countries

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Bruce Kraemer, Marvell

Sri Chandra, IEEE

IEEE
SECTIONS
CONGRESS
/// 2014

Shedding a little (LED) light

Consider this common scenario

Anika and her brother Vivaan come home from school. Vivaan sit downs and starts his studies right away and completes them before dinner. But Anika has to help her mother with chores first.

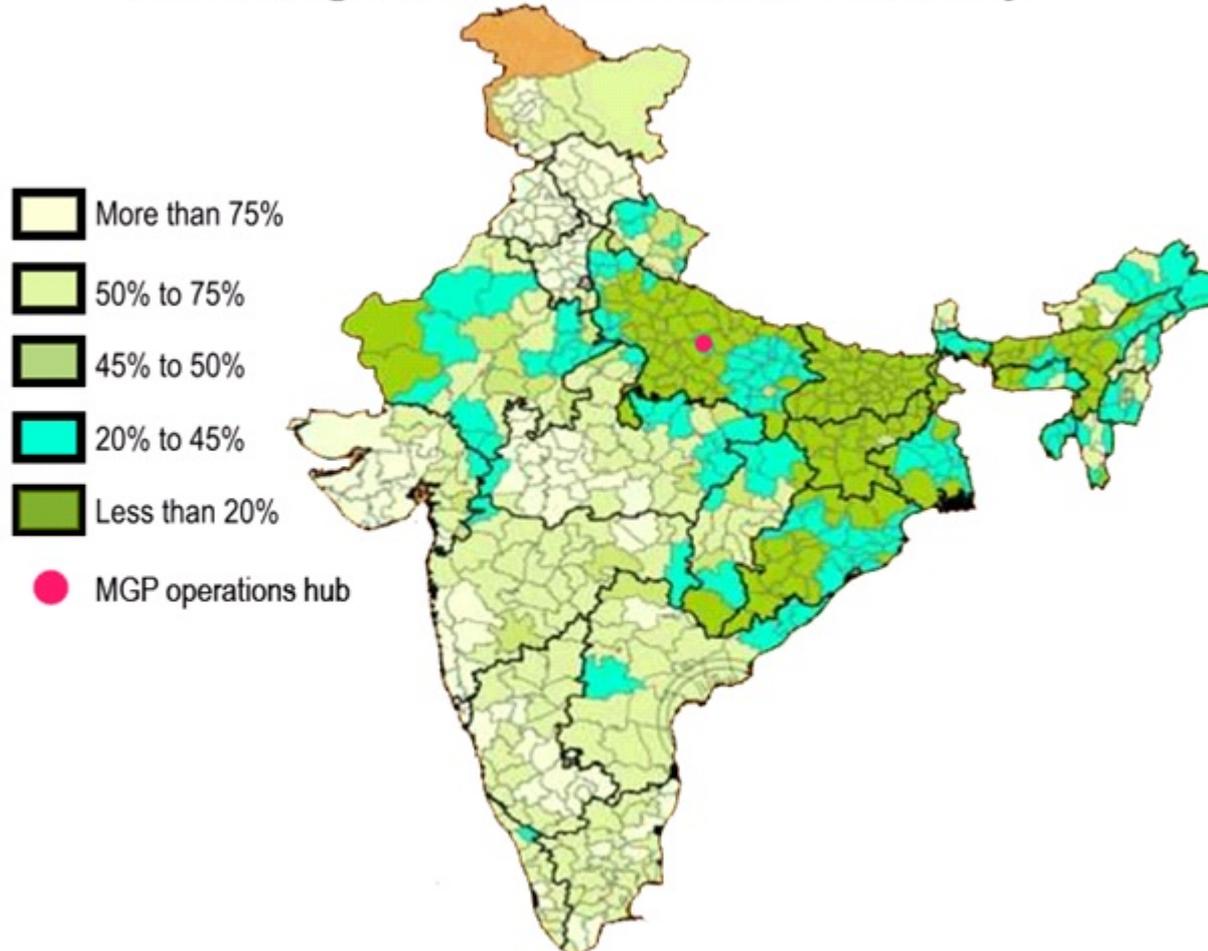
After dinner is cleaned up it's time for Anika to study but now its dark. When near enough to provide useful light to study the kerosene lamp creates a small torture for Anika due to the heat on her face and the smoke in her eyes. Her eyes are smarting; the lighting is not good. It's very easy to give up, and so Anika puts the homework aside or her family decides, well, we can't really spend that much money on the kerosene, let's put the lamp out.

Day after day Anika hasn't adequately finished her homework . She falls behind in class and eventually drops out of school.

If it's something as simple as access to lighting that allows children to study more and is derailing girls from the education track, well that's something that we can help to fix. So let's fix it.

Electricity in India

Percentage of Households with Electricity



Source: "Sustainable and Renewable Energy Environment Scan / Demand Assessment, India", Grow Wellington, February 2009.

Low Voltage DC Forum, India

- ▶ India: 1.26 Billion people, 17.5 % of world, 2.6% of global GDP
- ▶ Power is needed to build , feed, move and educate the population

Power infrastructure is overstressed and hence unreliable in rapidly expanding urban areas

- ▶ At the same time 300 million people have never had electricity
- ▶ IEEE PES is engaging with industry to dramatically improve energy efficiency in high consumption commercial buildings
- ▶ **And**
- ▶ Targeting deployment of 20GW of new solar powered microgrids by 2022 to communities with no power

IEEE Engaging the community in emerging technologies for the benefit of humanity



Micro-Grid Value Proposition

Each household gets 0.2 amp for 7 hours/night.

Enough to light 2 LED lights and a mobile phone charger.

Monthly fee = 100 rupee = \$1.70

Collaboration is our *Foundation*



In Academia



In Industry



In The Field



IEEE brings people and technology together for mutual benefit



IEEE-SA Presence

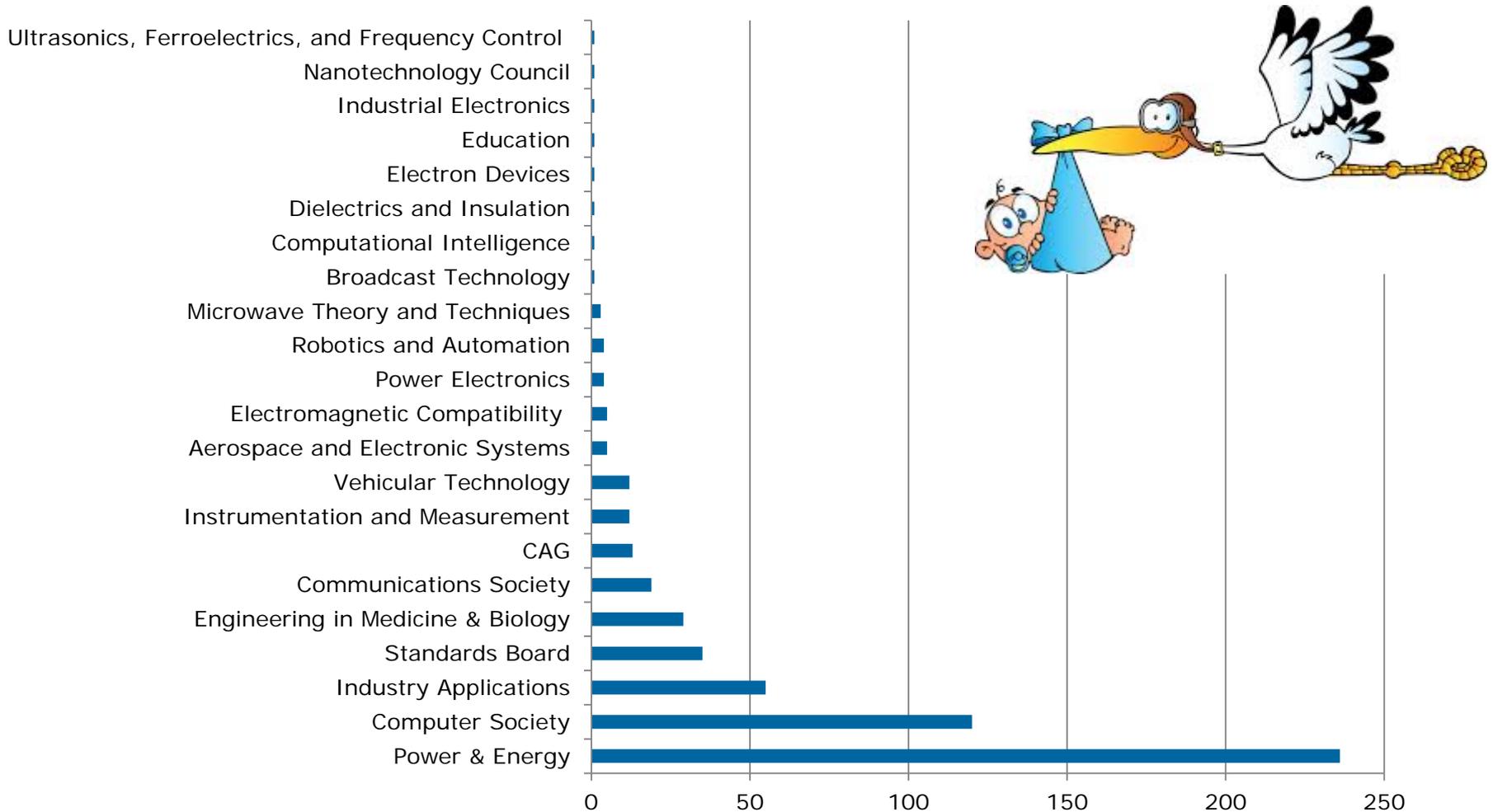
- ▶ Globally recognized standards
- ▶ Clear IPR policy
- ▶ Over 900 active standards
- ▶ More than 500 standards under development
- ▶ Over 7,000 individual members and 20,000 standards developers from every continent
- ▶ 200+ corporate members



IEEE-SA Strengths

- ▶ Leverage the breath of 40+ technical areas
- ▶ Smart Grid standards quoted in NIST
- ▶ Flagship transport layer standards in communications (IEEE 802)
- ▶ 400-500 standards focused on the power and energy sector, etc.
- ▶ Independent global community
- ▶ Open standards process

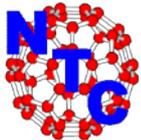
Where do Standards come from?



IEEE Standards Are Pervasive

Address a broad spectrum of technologies

- Aerospace Electronics
- Bioinformatics
- Broadcast Technology
- Clean Technology
- Cognitive Radio
- Design Automation
- Green Technology
- LAN/MAN
- Nanotechnology
- Reliability
- Power & Energy
- National Electrical Safety Code
- Next Generation Service Overlay Networks
- Organic Components
- Portable Battery Technology
- Power Electronics
- Radiation/Nuclear
- Transportation Technology
- Test Technology
- Electromagnetic Compatibility
- Broadband Over Power Lines
- Medical Device Communications





What Do Standards Do?

- ▶ Standards are published documents that establish specifications and procedures designed to **ensure the reliability of the materials, products, methods, and/or services** people use every day
- ▶ Standards form the **fundamental building blocks for product development** by establishing consistent protocols that can be universally understood/adopted
- ▶ Standards establish **compatibility, interconnectivity, interoperability**, simplify product development, and speed time-to-market
- ▶ Standards make it easier to understand and **compare** competing products
- ▶ As standards are globally adopted and applied in many markets, they also **help with international trade**
- ▶ Standards fuel the development and implementation of technologies that **influence and transform the way we live, work and communicate**



Standards Models: Evolution from Political to Economic

- ▶ Many regional SDOs focus on national or regional market
- ▶ International standards create products and services for use in a globalized world
- ▶ Economic impact is maximized when global markets drive standards
- ▶ IEEE SA ensures a balanced blend of technical alternatives, economic needs, and global requirements are considered



IEEE Standards: Market-Driven Model

Open Process

- Open membership
- Open participation

Consensus-based

- Based on WTO core principles
- Collaboration

eTools

- Facilitate remote participation, lessening travel costs

Global Community

- Participation from around the world

Standardization is borderless:

Global standards sustain products and services for implementation and use by customers in a globalized world



Standards Capture Markets

- ▶ Markets are enamored by new technology but still concerned about purchase risk.
- ▶ IEEE Standards result when the best engineers from across the globe converge to work on a common problem.
- ▶ While developing the standard they are promoting market awareness and hence market demand. They are also reducing buyer resistance by ensuring multiple sources and product options. Where interoperability is required assurances are provided.
- ▶ When done well, markets are waiting for standards and the products.
- ▶ Although some standards have regional origins IEEE-SA promotes global relevance.
- ▶ Potential for new players in emerging markets is immense with adoption of newer technologies and economic growth



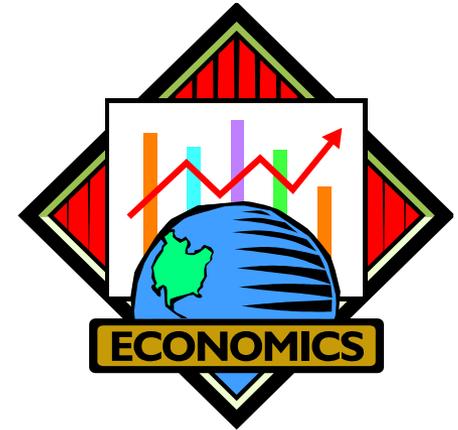
Globalization & Economic Growth

- ▶ Not every standard is created by IEEE. Not every standard is global - but consider some examples of the most well known, globally available and hence commercially important
- ▶ USB: memory, cable connections
- ▶ GSM and LTE cell phones
- ▶ IEEE 802.3 Ethernet
- ▶ IEEE 802.11 Wi-Fi

- ▶ Would anyone be concerned about buying or using such technology anywhere in the world?
- ▶ “Sometimes you don’t know what you got ‘til its gone...”
- ▶ What would the market look like if every store sold a unique kind of connector, wired or wireless service

Role of Technology Governance

- ▶ What is technology governance?*
- The governance, i.e., the steering between the different sectors—state, business, and NGOs—of the development of technology
- Concept is based on the notion of innovation and of techno-economic paradigm shifts
- Idea is that certain periods in economic development are dominated by a paradigm-leading technology
- ▶ The paradigm-leading technology today is **Information & Communication Technology (ICT)**
- ▶ Adoption of these new paradigms do not happen naturally
- Active intervention is required by all the three entities
- Standards play a critical role in technology governance & policy



Need for Global Standards in Today's World



Technology transfer becomes easier with access to global standards

- ▶ Regional and Global Societies are increasingly interconnected and aware
 - Ideas ,people, experiences, interactions and products travel faster and more frequently than before
 - Transportability and re-usability make the item more valuable in this connected and globalized world, standards and technology governance play a very key role
 - Interoperability is critical to enable connected systems
 - Security and privacy are growing concerns that need to be addressed in a global platform

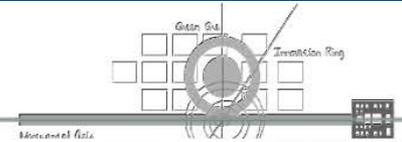
- ▶ Participation in global standards development allows:
 - Engagement of both academic and industry stakeholders to collaborate
 - Countries to engage in global business, enabling economic growth
 - Free trade with the participation of global industries in regional markets

Value Proposition of a Standard

- Proposition A
 - I wrote a 50 page standard for this WLAN on the flight over here.
 - I'm sure it will work.
 - I'll sell you a copy for \$50.
- Proposition B
 - I and 500 of my engineering buddies from 30 countries spent the past 25 years writing, and rewriting this 4000 page WLAN standard.
 - We're selling products based upon this at the rate of 3 million per day.
 - I'll sell you a copy for \$560

Internet of Things: Smart City Guadalajara

GUADALAJARA
CIUDAD CREATIVA DIGITAL



CCD LOCATION:

- In **Guadalajara's Historic center**
- Around **Parque Morelos**
- It is part of a Comprehensive strategy for the **revival and regeneration** of the main city area
- CCD core area is **40 hectares+ Parque Morelos**
- Area of direct beneficial influence is **380 hectares.**
- **DUIS certification** is a prerequisite for the Digital Creative City



How Standards Participation Benefits Career Growth

- ▶ Participation in standards development is key to growing technology leadership within an organization
 - In a region, builds the community (e.g., education, lifestyle)
 - Growth in technology leadership leads to growth of the industry
 - Presence in global forums is critical to establish and sustain successful growth of industry in technology sectors
 - Technology growth
- ▶ Contributing and participating in standards development has direct and indirect benefits
 - Enables the development of thought leadership in the region
 - Individuals develop technology skills as well as soft skills
- ▶ Various ways of contributing to standards
 - Observers
 - Contributors
 - Drivers/Leaders



IT business in India

For India's IT businesses, the sky is the limit.

Rarely has an industry grown so rapidly for so long.

IT has boasted annual growth rates of nearly 30% in the past ten years, with revenues now nearing \$50 billion, about 5.4% of India's GDP.

Major suppliers include Tata Consultancy Services (TCS), Infosys and Wipro

IT employs 1.6m people

How can the growth and benefit be sustained?



Cloud Innovation Council

- ▶ India wants to establish itself as a major source of Cloud Computing Innovation and Services
- ▶ Leverage and extend an existing base of computer science expertise and computer service facilities
- ▶ IEEE is bringing government & academia and industry together to accelerate India's leadership in delivery of Cloud Computing to the world
 - Industry & technology leaders
 - Academic experts
 - Government bodies (Department of IT and Telecom)
 - Entrepreneurs
- ▶ Cloud Computing Council for India (CCICI)
 - Cloud Computing innovation roadmap will be used to focus India's IT engineering resources on high value add opportunities





Skills Development Initiatives

- ▶ Skills development and capacity building are core to growth of both Industry as well as the economic growth within the region
 - Addressing skills gap between student and industry
 - Professional development of engineers
 - Promote critical skills in emerging technologies
- ▶ IEEE is engaged in number of skills development programs
 - SWEBOK (Software Engineering Body of Knowledge): IEEE Computer Society
 - WCET (Wireless Certification program): IEEE Communications Society
 - VLSI Skills Development program to bridge skills gap between students and industry in India
 - IEEE 802.11 carrier-grade WiFi training program to support the growth of the telecom industry in India (under proposal)
 - Cyber Security training program (under proposal)
- ▶ IEEE Standards Education offers programs to enable understanding of standards and its importance to the student community



IEEE
802[™]

IEEE-SA Contacts & Resources



Resources

- ▶ IEEE-SA Home Page:
<http://standards.ieee.org>
- ▶ Standards Education
<http://trystandards.org>
- ▶ IEEE-SA Industry Connections:
<http://standards.ieee.org/prod-serv/indconn/index.html>
- ▶ IEEE-SA News:
<https://standards.ieee.org/news/index.html>

Contacts

Moira Patterson, Title
m.patterson@ieee.org

Sri Chandra, Title
sri.Chandra@ieee.org

Bruce Kraemer, Marvell
bkraemer@marvell.com



IEEE

*Advancing Technology
for Humanity*

IEEE PES in India

With an eye on the future, engineers in India have been working hard to be able to bring renewable energy to their citizens, some of which do not even have electricity today.

This IEEE TV program interviews some professional engineers in India about their efforts and their involvement in IEEE's Power and Energy Society (PES).

PES has been able to open a lot of doors for students in India and has given them opportunities to grow as engineers in the field.

The IEEE Power and Energy Society heavily supports India's development and is always looking for ways to help the country grow.

<https://ieeetv.ieee.org/player/html/viewer?dl=#pes-in-india>

Per Capita Electricity Consumption

