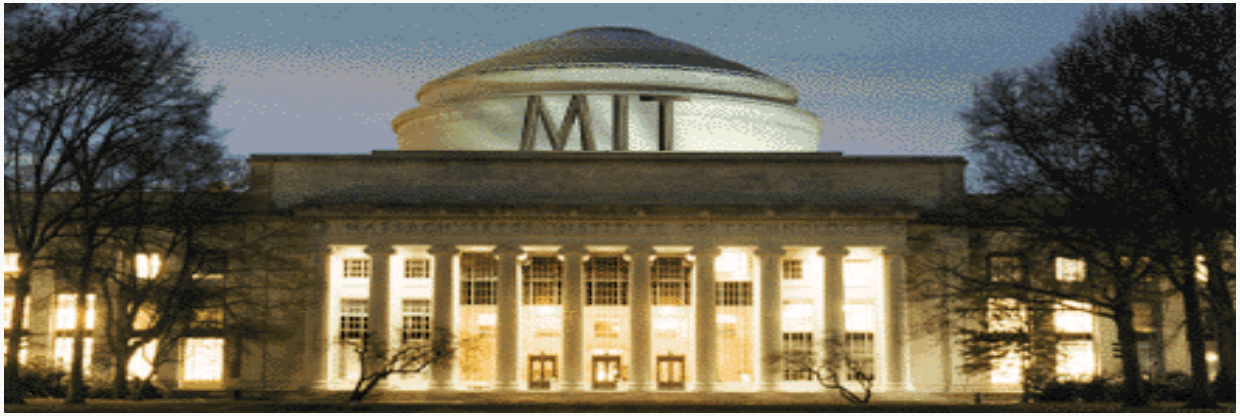

Information & Communication Technologies: A Necessity

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3rd Arab Conference on Industrial Information & Networks, October 29-31, 2007, Damascus

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Presentation Outline

- ICT & Globalization
- Networked Readiness Index
- ICT & Singapore
- ICT Applications
  - ✓ Industrial IT Enabled Products
  - ✓ Health Information Technology
  - ✓ …
- Conclusions

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ICT & Globalization

- Increase in the connectivity and interdependence of the world's markets and businesses.
- Telecommunications, internet, and information technologies, increased the globalization pace.
- Goods, services, labor, technology and capital became more mobile between nations.

- Opportunities and competition.
- Pro-globalization organizations:
  Opportunities and forces efficient production agents. :
  - World Trade Organization
  - World Economic Forum

- Anti-globalization organizations:
  Agents without proper resources and infrastructures cannot compete. [8]

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Information & Communication Technologies

- **Management**
  - ✓ e-business and
  - ✓ ICT systems management
  - ✓ …
- **Development and implementation**
  - ✓ business software development,
  - ✓ programming,
  - ✓ web development,
  - ✓ database development,
  - ✓ communication network development,
  - ✓ systems integration and
  - ✓ installation
  - ✓ …

[1]

- **Operations**
  - ✓ technical support,
  - ✓ user help and support,
  - ✓ network administration,
  - ✓ web administration,
  - ✓ database administration
  - ✓ …
- …

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… Information & Communication Technologies …

Singapore

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On Information Technology and Singapore's Future

" Not Choice
But a Necessity "

Singapore's Foreign Affairs Minister **George Yeo**

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Singapore's Strategy

"Identify the larger trends early
and stay ahead of the game"

"… use of information technology to maintain
our information advantage in the region."

"… push the use of information technology
across all sectors…"

" … prepare every Singaporean for the IT world."

Intelligent land !

[3]

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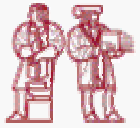

Singapore's Strategy

- World-class infrastructure.
- Education of entire population in IT
- Hub for electronic commerce

[3]

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Singapore's Strategy - Infrastructure

- Provide broad-band everywhere (wired and/or wireless)
- Connect every home, office and hotel room.
- Remove bandwidth as a constraint in Singapore.
- Provide a coaxial connection to a national optical fiber network for every household (satellites and undersea cables).
- Require broad-band for every new home.

[3]

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Singapore's Strategy - Education

- Educate the entire population in IT.
- Teach IT to every child regardless of the family background.
- Provide one computer for every 2 school Children from first grade on.
- Provide every teacher with a notebook.
- Every school is on the Education Ministry's wide area network.
- Computer literacy for every Singaporean
- Many government applications and transactions are on-line.
- …

[3]

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Singapore's Strategy – eCommerce

- Hub for commerce and finance: requires electronic commerce
- Establish a facilitating system of
  - ✓Law
  - ✓Regulation and
  - ✓Supervision.
  - ✓Legal framework for contracts and enforcement.
  - ✓Courts and judges must have a good understanding of the technology.
- Protect privacy.
  - ✓Digital signatures
  - ✓Hub of trust
  - ✓First secure electronic transaction in the world was conducted in Singapore by Visa cards.
- …

[3]

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Singapore: A leading state

- Singapore's Changi Airport
  - ✓No domestic routes
  - ✓Used by choice
- Port of Singapore
  - ✓Dependent on trans-shipment.
  - ✓Use of Information technology.
  - ✓Paperless since the late 1980's.
  - ✓Use of artificial intelligence for loading sequence of containers

[3]

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Singapore: A leading state

- "Does not grow coffee but is a major supplier of coffee beans in the world.
- Does not produce spices but is the centre of the Southeast Asia spice trade.
- Does not have any oil but refines lots of it, and is a trading centre for oil and related products.
- Biggest exporter of Swiss watches in the region."
- …

[3]

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… Networked or not Networked ? …

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(NRI)
World Economic Forum

- Understand the impact of ICT on the competitiveness of nations.
- Measure the tendency for countries to exploit the opportunities offered by information and communication technologies.
- …

[2,4,5]

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Networked Readiness Index (NRI) 3 components

- Environment for ICT offered by a community
- Readiness of the community to use ICT (individuals, businesses, governments, etc…) and
- Usage of ICT by such a community

[2,4,5]

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Networked Readiness Index 2004-2005/2006-2007

- - 113 Cameroon
- - 114 Paraguay
- - 115 Mozambique
- - 116 Lesotho
- - 117 Zimbabwe
- - 118 Bangladesh
- - 119 Ethiopia
- - 120 Angola
- - 121 Burundi
- - 122 Chad
- …

- 4-1 Denmark
- 6-2 Sweden
- 1-3 Singapore
- 3-4 Finland
- 9-5 Switzerland
- 16-6 Netherlands
- 5-7 United States
- 2-8 Iceland
- 12-9 United Kingdom
- 13-10 Norway
- …

[2,4,5]

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Networked Readiness Index : Weakest Points

- Telephone mainlines
- Telephone subscribers
- Availability in cellular phones
- Internet hosts
- Internet access in schools
- Collaboration in clusters
- Effectiveness
- …

- Quality of business schools
- Capacity for innovation
- Brain drain
- Investment training
- Ease of access to loans
- Buyer sophistication
- Buyer dynamism
- Laws relating to ICT
- …

[2,4,5]

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Networked Readiness Index : Strong Points 1-2

- **Singapore**
  - ✓ Effectiveness of lawmaking
  - ✓ Laws relating to Information, Communication Technologies
- **Iceland**
  - ✓ Secure Internet servers
  - ✓ Internet hosts
- **Finland**
  - ✓ University-industry collaboration
  - ✓ Quality of public schools
- **Denmark**
  - ✓ Effectiveness of judiciary
  - ✓ Intellectual property protection
- **United States**
  - ✓ Venture capital availability
  - ✓ Quality of business schools

[2,4,5]

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Networked Readiness Index : Strong Points 2-2

- **Sweden**
  - ✓ Intellectual property protection
  - ✓ Broadband-cable modem
- **Hong Kong**
  - ✓ Ease to start a new business
  - ✓ Affordability of Internet access
- **Japan**
  - ✓ State of cluster development
  - ✓ Business investment in R&D
- **Switzerland**
  - ✓ Telephone mainlines
  - ✓ Investment training
- **Canada**
  - ✓ Secure Internet servers
  - ✓ Subsidies for firm-level R&D

[2,4,5]

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Networked Readiness Index - strong correlation

- ICT spending and productivity at the national level
- Rankings and global competitiveness

John Chambers, **Cisco Systems.**

[2,4,5]

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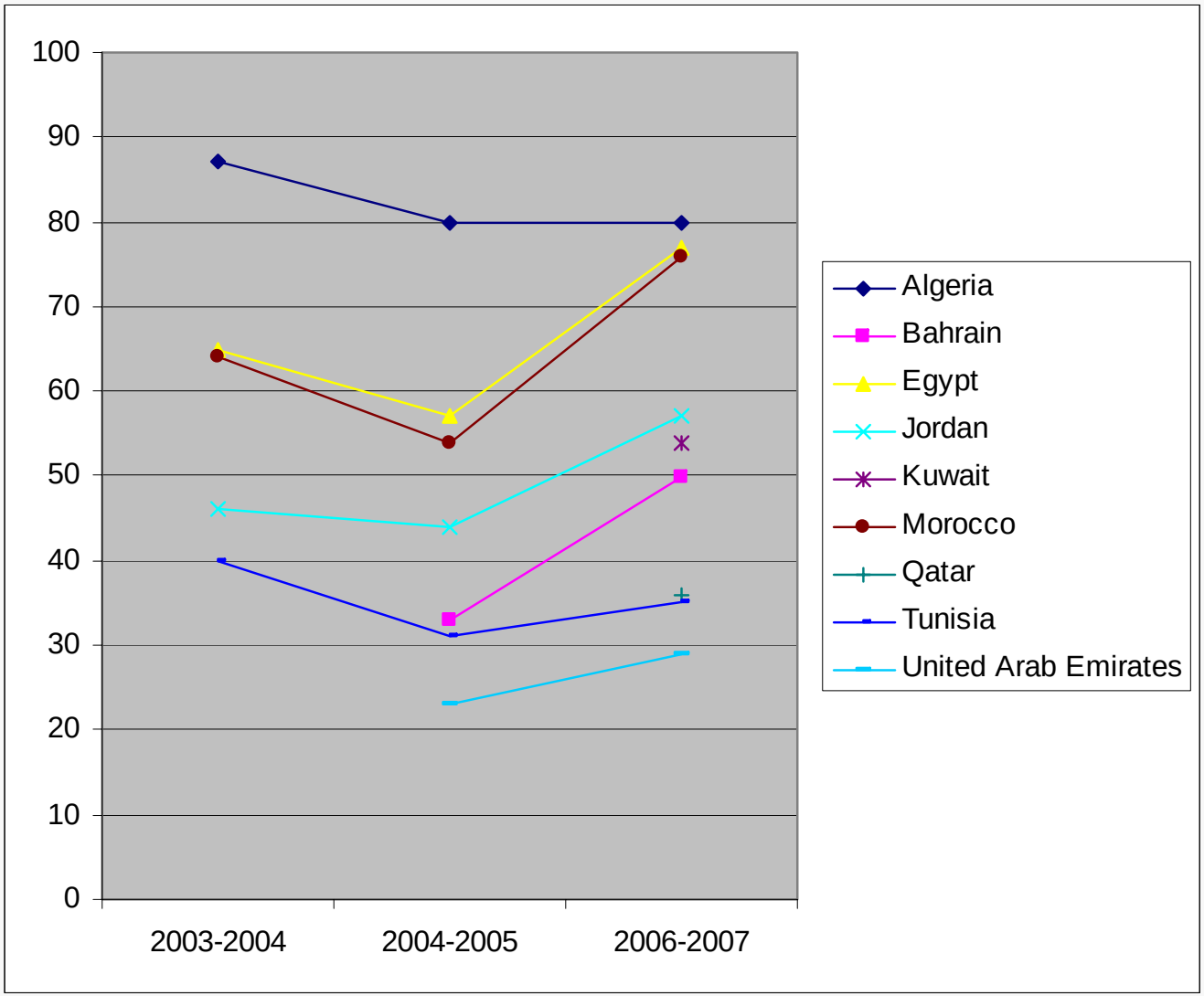
Some Arab Countries 03-04/04-05/06-07



[2,4,5]

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… Industrial Information and Communication Technologies & Applications …

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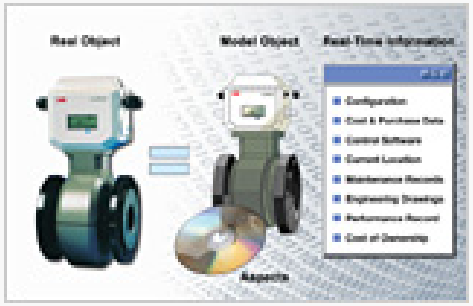
Industrial IT Enabled Products

- Industrial IT enables products to work together in a seamless fashion
- Information enabled products
- Compatible Building Blocks
- Enabling architecture



ABB

[7]

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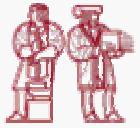

Industrial IT Enabled Products: Applications

- Utilities,
- Process Industries,
- Manufacturing,
- Oil, Gas, and Petrochemicals, and
- …

[7]

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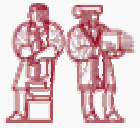

Industrial IT Enabled Products

- Device is equipped with hardware/software that hold all the information necessary to
  - ✓ Install,
  - ✓Operate,
  - ✓Control,
  - ✓Troubleshoot,
  - ✓Maintain , and
  - ✓Communicate with other devices and networks
  - ✓…

[7]

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Industrial IT Enabled Products:
Software & object oriented approaches

- Incorporate a device (a sensor, motor, robot, etc...) by copying and pasting its icon
- Model icons can be arranged in a variety of folder-like structures based on type, physical location, function, etc…
- Setup, Reconfigure, troubleshoot, optimize devices by a mouse click.

[7]

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Benefits of product IT enabled

- Allows to achieve all automation functions
  - ✓ In a single operation and
  - ✓ Engineering environment;
  - ✓…
-

[7]

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Benefits of product IT enabled- productivity gains and cost savings

- "Reducing the time to decision and action
- Engineering for maximum performance
- Reducing risk through high integrity automation
- Integrating information for improved visibility
- Improving batch production profitability, consistency, and traceability
- Optimizing plant asset availability and performance
- Delivering Control and I/O to meet automation and safety needs
- Extending installed system capabilities through seamless evolution "

[7]

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Health Information Technology

- Use of information technology for health records
  - ✓ Avoid dangerous medical mistakes,
  - ✓ Reduce costs, and
  - ✓ Improve care.

[6]

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Health Information Technology

- **Establish Health Care Information Standards**
  - ✓ Store/share electronically medical information
  - ✓ Assure privacy and security.
  - ✓ …
- **Invest in Projects on Health Care Information Technology.**
  - ✓ Test effectiveness of technology and
  - ✓ Establish best practices for more widespread adoption
  - ✓ ..
- **Foster the adoption of the Health Care Information Technology by the Federal Government**
  - ✓ Create incentives/opportunities for health care providers
  - ✓ Review policies and programs
  - ✓ …
- …

[6]

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Conclusion

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- ICT Applications
  - ✓ Industrial IT Enabled Products
  - ✓ Health Information Technology
  - ✓ …
- …

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MIT
Massachusetts Institute of Technology

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