Université du Québec
École de technologie supérieure
Department of Software and IT Engineering

Keeping Pace with Information and Technology

François Coallier
Francois.coallier@etsmtl.ca

ÉTS
le génie pour l'industrie





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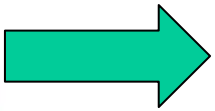

What is ICT ?

ISO/IEC JTC 1 Terms of References:

Standardization in the field of Information Technology.

Information Technology includes the specification, design and development of systems and tools dealing with the capture, representation, processing, security, transfer, interchange, presentation, management, organization, storage and retrieval of information

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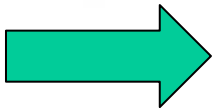


- What is ICT
- Why ICT is important to Canada
- ICT Trends
- Globalization of ICT
- ICT Standardization
- Conclusions

Markets Size (10^9 US $)

Global ICT 1998 [1]

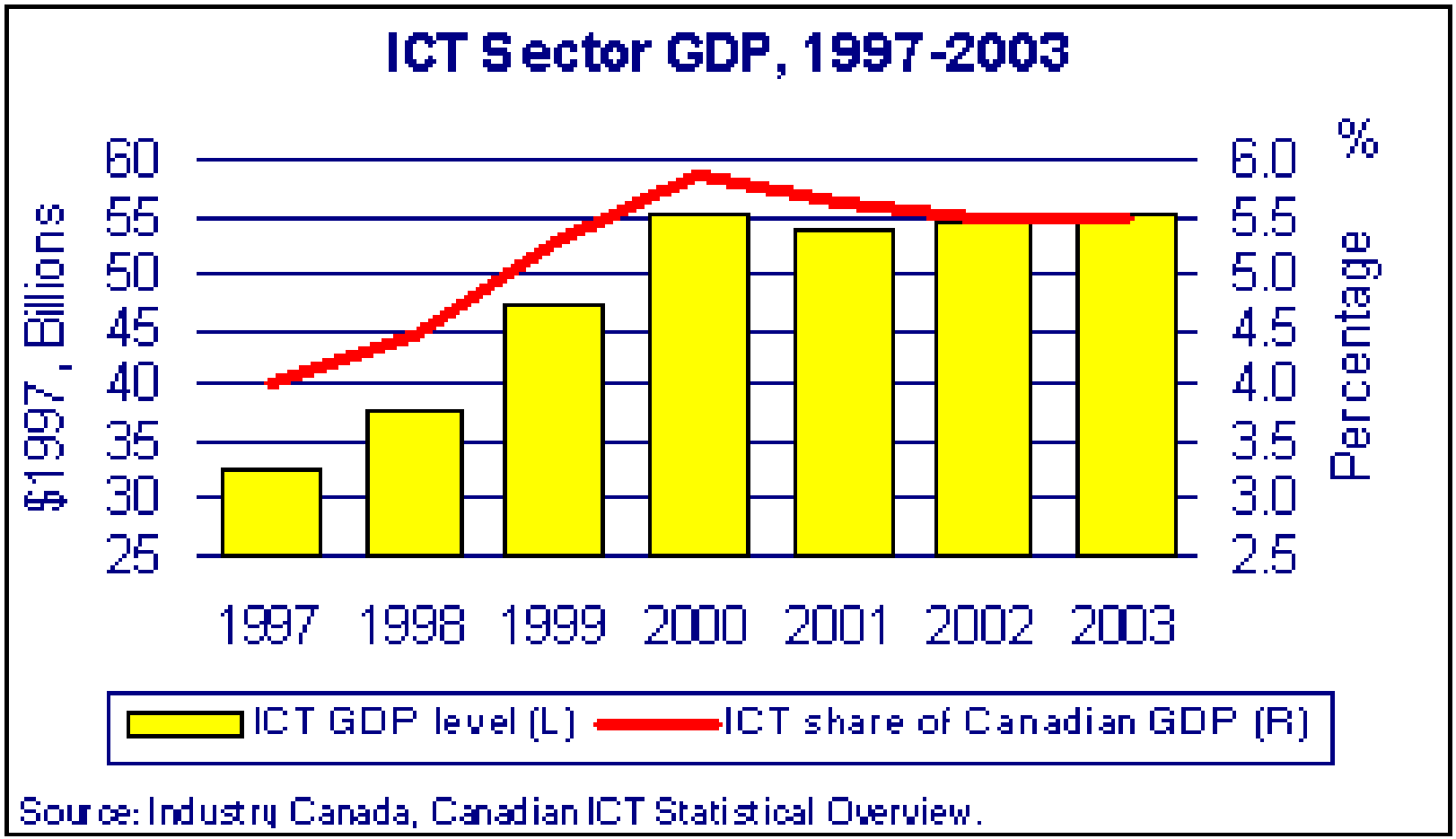
Telecommunications	777
IT Hardware	336
Internal Spending	304
IT Services	266
IT Software	115
Other Office Equipment	29
TOTAL	**1 827**

ICT Vendor 2002 [2]

Telecommunications equipment	380
Computer Systems Hardware	240
Software Licenses	70
Project Oriented IT Services	250
Semiconductors	150
Support/Management IT Services	350
TOTAL	**1 440**

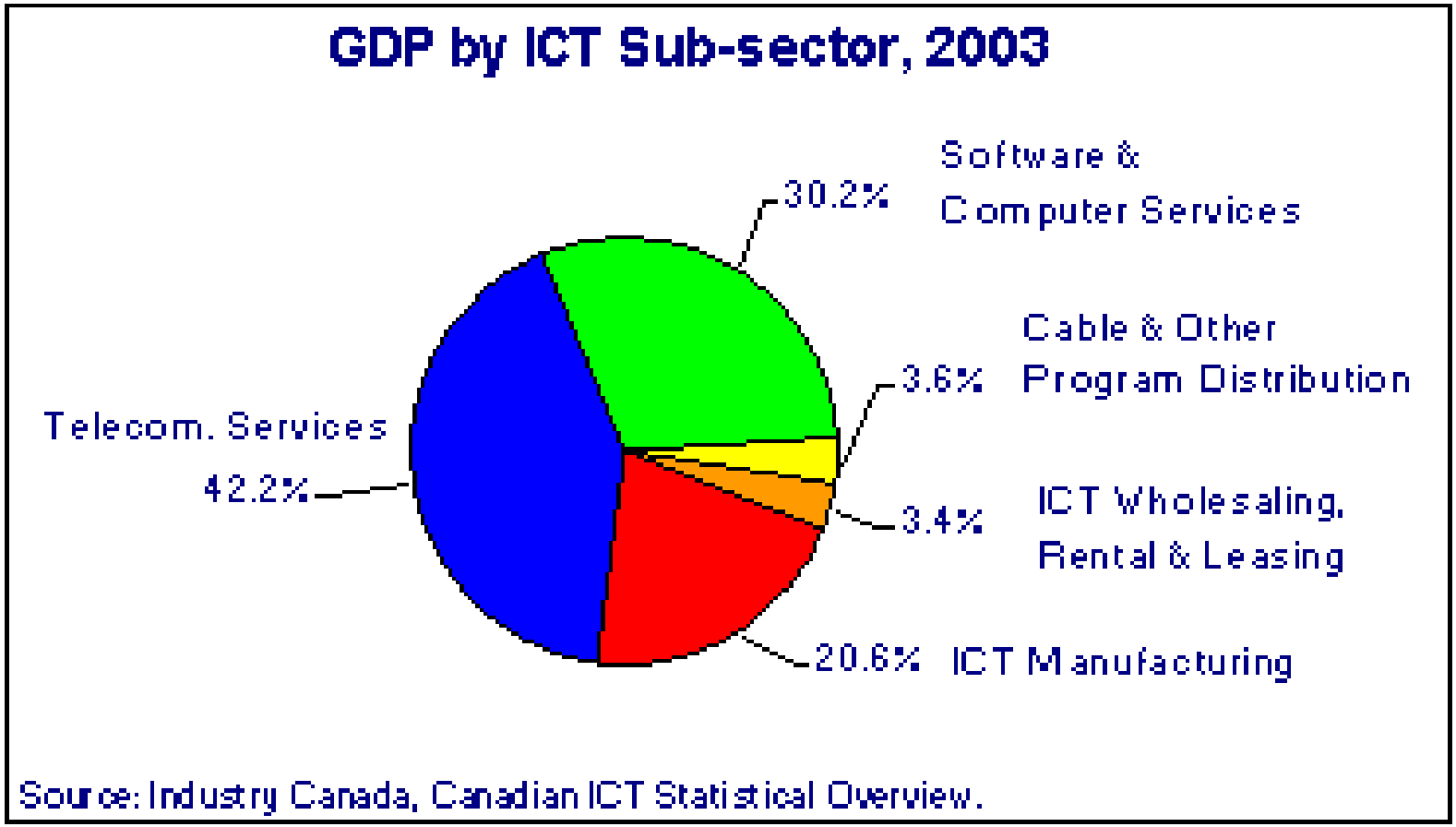
[1] Miller, H.; Sanders, J , Scoping the global market: size is just part of the story , IEEE IT Professional, Volume: 1 Issue: 2 , March-April 1999, Page(s): 49 -54
[2] R.Fulton, COM-15-1667, Predicts 2002 – What's Ahead for the IT Industry, Gartner Research, Research Note, 2002-01-08

Canada's market



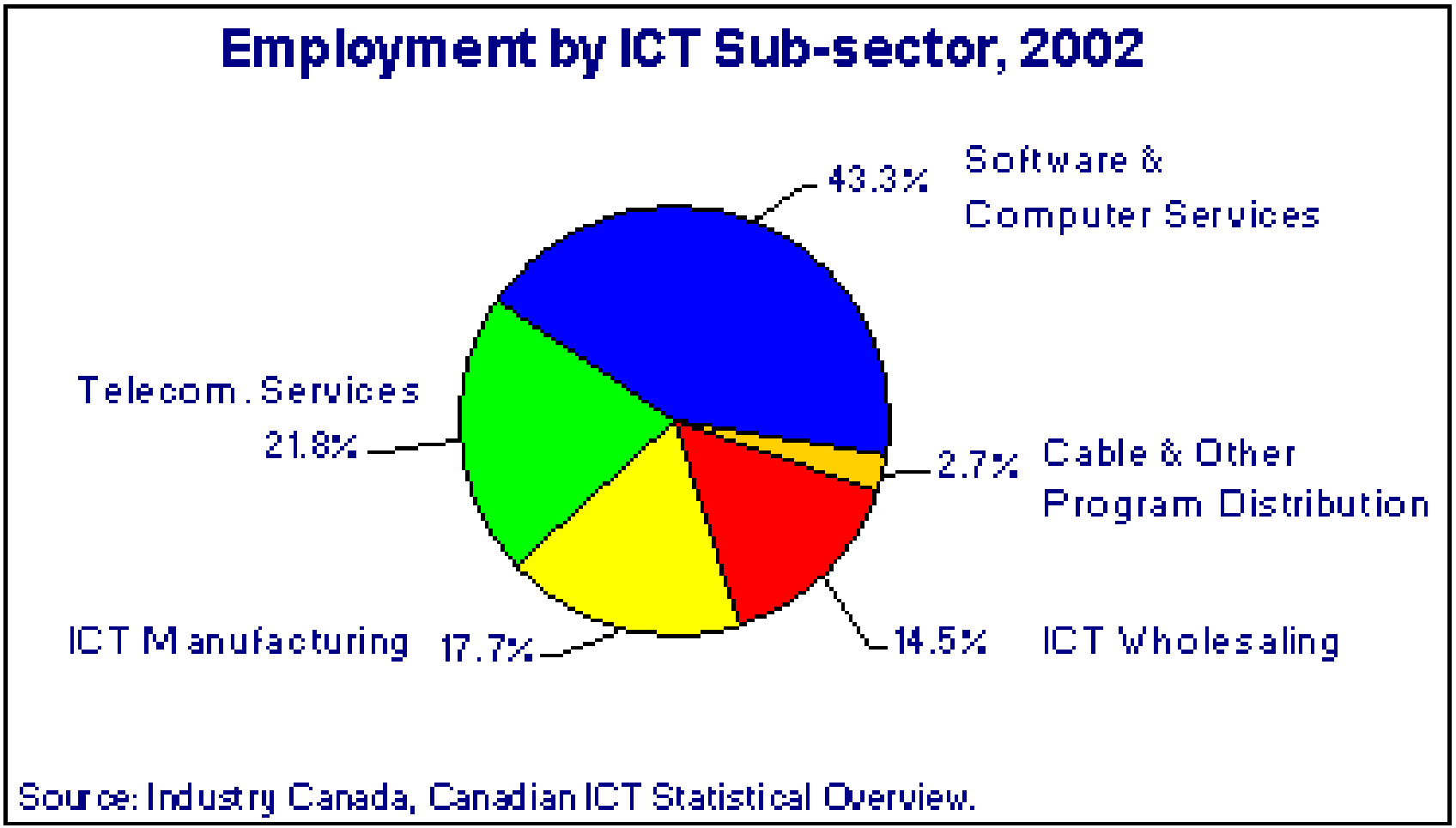
http://strategis.ic.gc.ca/epic/internet/inict-tic.nsf/en/h_it07229e.html

Canada's market



http://strategis.ic.gc.ca/epic/internet/inict-tic.nsf/en/h_it07229e.html

Canada's market



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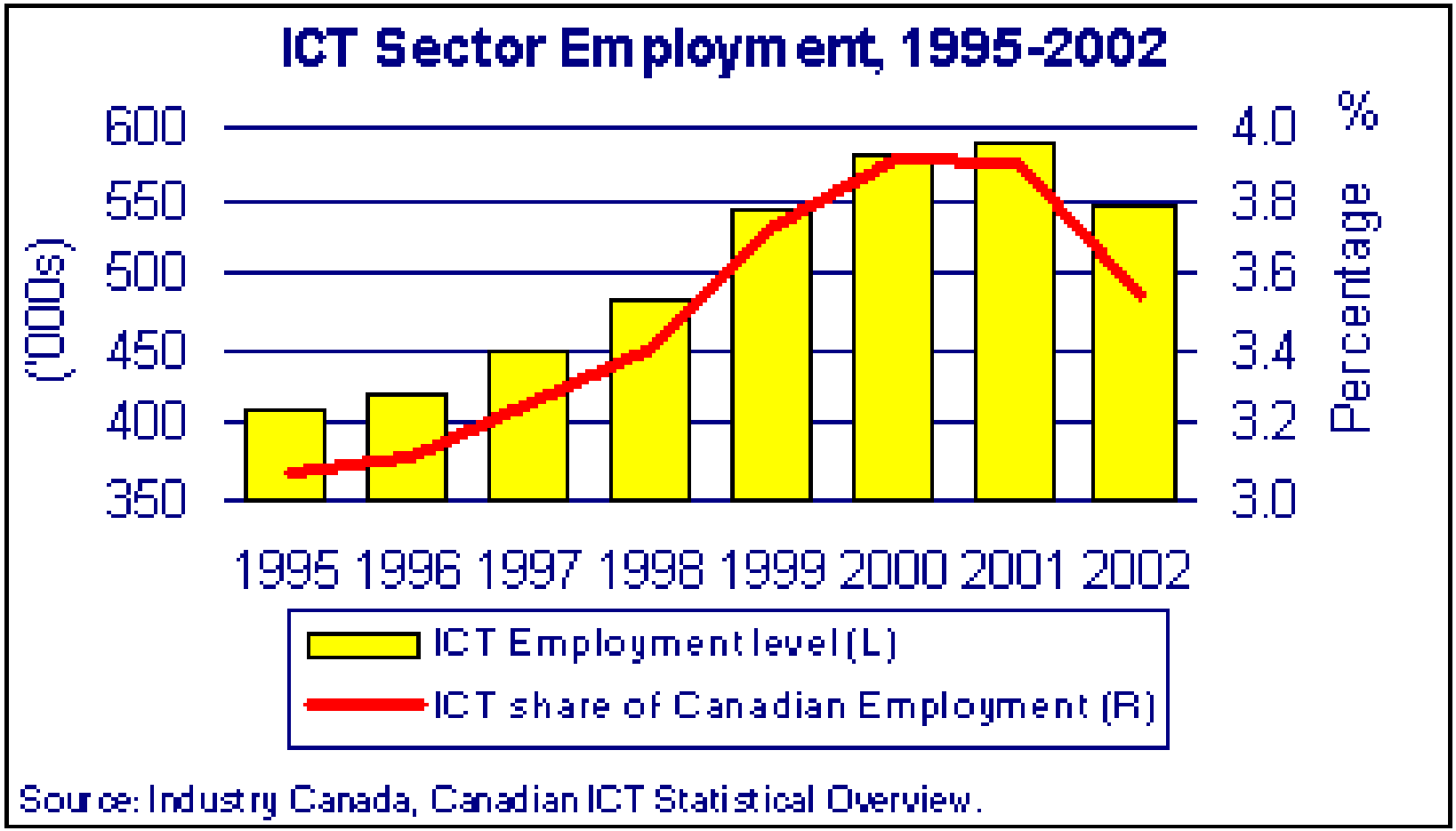
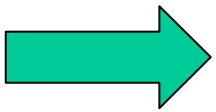
Canada's market



http://strategis.ic.gc.ca/epic/internet/inict-tic.nsf/en/h_it07229e.html

ICT is also an enabler

- Very important part of the global and national infrastructure
- ICT is embedded in many product, and a very large chunk of the service industry



These trends are increasing

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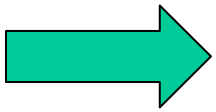

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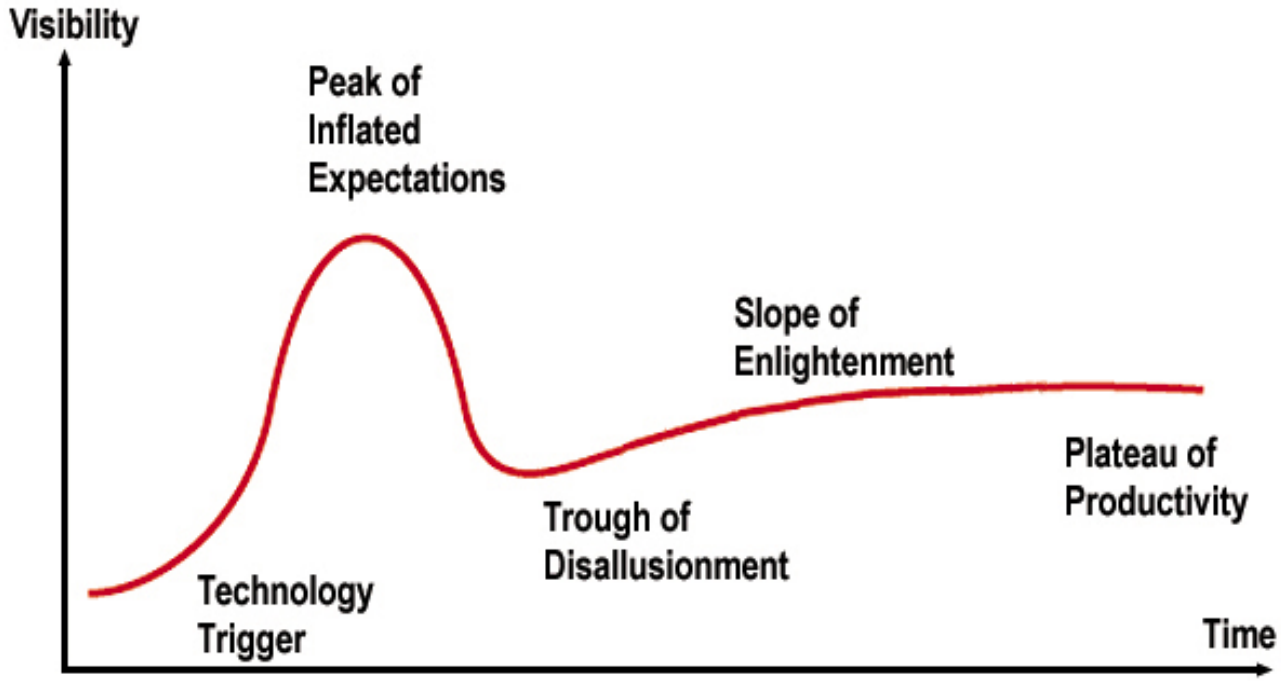
Technology Hype Cycle



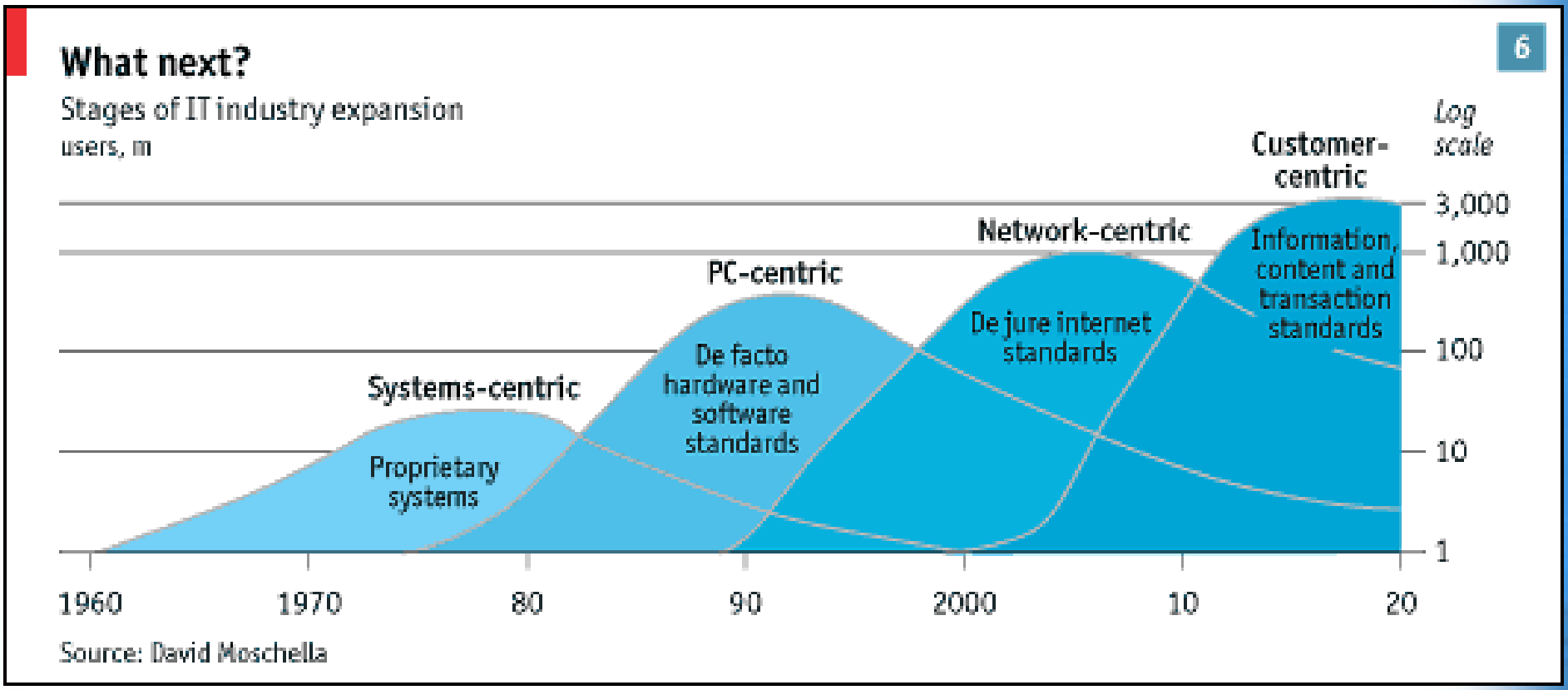
-Gartner Group

http://www3.gartner.com/1_researchanalysis/mrr/1201mrr.pdf

http://www.logophilia.com/WordSpy/hypecycle.asp

http://www.anvil.eu.com/Documents/PositionPaper5.htm

ICT Trends



From: *The fortune of the commons*. In *Coming of Age - A Survey of the IT Industry*. The Economist, May 8th 2003

How much information ?

Table 1.2: Worldwide production of original information, if stored digitally, in terabytes circa 2002. Upper estimates assume information is digitally scanned, lower estimates assume digital content has been compressed.

Storage Medium	2002 Terabytes Upper Estimate	2002 Terabytes Lower Estimate	1999-2000 Upper Estimate	1999-2000 Lower Estimate	% Change Upper Estimates
Paper	1,634	327	1,200	240	36%
Film	420,254	76,69	431,690	58,209	-3%
Magnetic	4,999,230	3,416,230	2,779,760	2,073,760	80%
Optical	103	51	81	29	28%
TOTAL:	5,421,221	3,416,281	3,212,731	2,132,238	69%

Source: How much information 2003
http://www.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm#summary

How much information ?

Table 1.13: The size of the Internet in terabytes.	
Medium	**2002 Terabytes**
Surface Web	167
Deep Web	91,850
Email (originals)	440,606
Instant messaging	274
TOTAL	**532,897**

Source: How much information 2003
http://www.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm#summary

Summary

- ICT ubiquity will increase
- ICT is already a critical component of Canada's infrastructure, and will become more so
- Some key technological/market trends:
  - Machine to machine (M2M) transactions
  - Utility computing
  - Multimedia
  - Mobility
  - Home / personal

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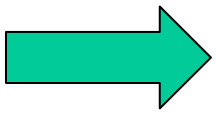

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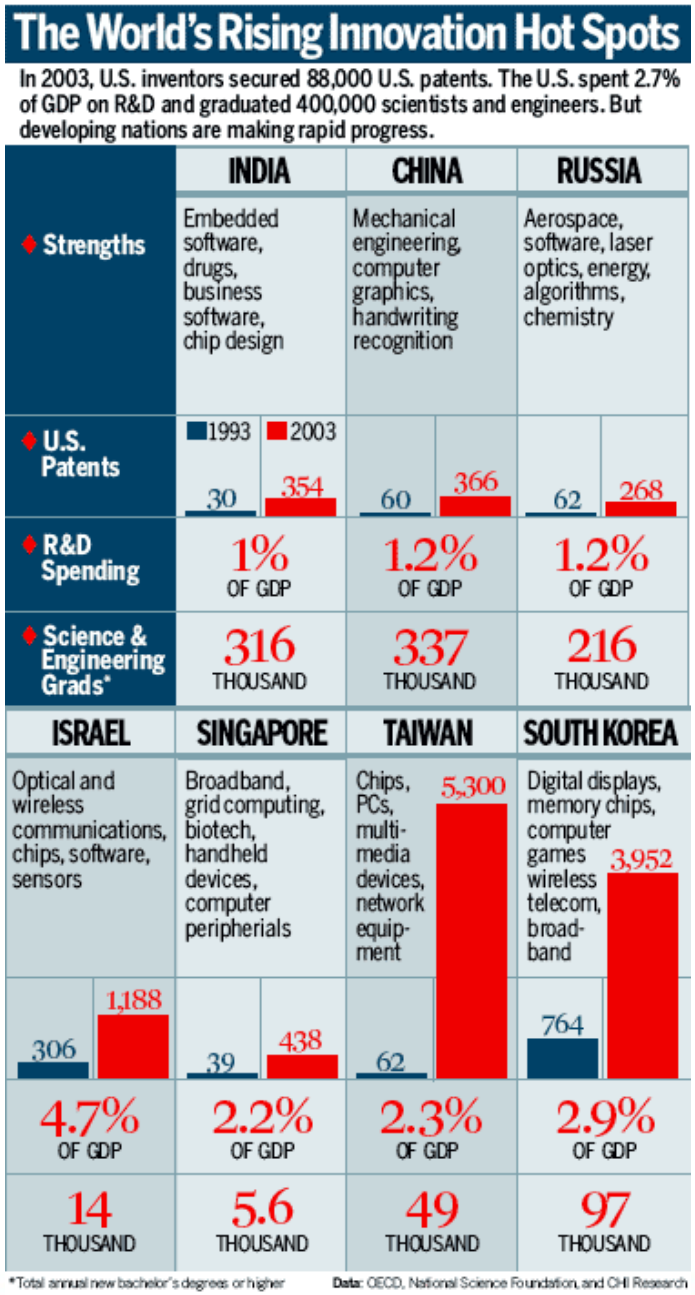
IT Globalization: Offshoring

LEADER	India
CHALLENGERS	Canada, China, Czech Republic, Hungary, Ireland, Israel, Mexico, Northern Ireland, Philippines, Poland, Russia, South Africa
UP-AND-COMERS	Belarus, Brazil, Caribbean, Egypt, Estonia, Latvia, Lithuania, New Zealand, Singapore, Ukraine, Venezuela
BEGINNERS	Bangladesh, Cuba, Ghana, Korea, Malaysia, Mauritius, Nepal, Senegal, Sri Lanka, Taiwan, Thailand, Vietnam

The offshore IT race. *SOURCE: CARTNER INC as quoted by the Globe and Mail in IT jobs contracted from far and wide , North American companies are saving money by 'offshoring', John Saunders, The Globe and Mail, 2003-10-14, http://www.theglobeandmail.com/servlet/story/RTGAM.20031014.gtrjobs14/BNStory/einsider*



IT Globalization: Training & R&D

Canada:
R&D: 1.8% of GDP
Grads (98): ~ 35 K
Patents (00): ~ 3,6 K

From:
Scouring The Planet For Brainiacs
Worldwide innovation networks
are the new keys to R&D vitality
-- and competitiveness
BusinessWeek, October 11, 2004

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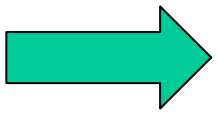

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What is a Standard?

Guideline documentation that reflects agreements on products, practices, or operations by nationally or internationally recognized industrial, professional, trade associations or governmental bodies

or

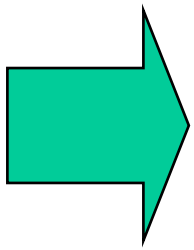
is accepted as a de facto standard by industry or society.

Types of Standards

- Organization Standards
  - Such as internal company standards
- Market Standards (De Facto)
  - Such as Microsoft Windows
- Professional Standards
  - Developed by Professional organizations (such as IEEE)
- Industry Standards
  - Developed by industrial consortia (such as the OMG)
- National Standards
  - Developed by national standards organization
- International Standards
  - Developed by formal international standard organization

ICT Standards

ICT



- Social and Cultural
- Processes and Methods
- Human Interfaces
- APIs and Middleware
- Hardware and Devices
- Base Technologies

International Standardization

(Technical standards)

- International Telecommunication Union (ITU)
  - Founded: 17 May 1865
  - Scope: international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services.
- International Organization for Standardization (ISO)
  - Founded: 1947
  - Scope: The mission of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity.
- International Electromechanical Commission (IEC)
  - Founded: June 1906
  - Scope: the leading global organization that prepares and publishes international standards for all electrical, electronic and related technologies.

JTC 1

Technical Areas	JTC1 Subcommittees and Working Groups
Application Technologies	SC 36 - Learning Technology
Cultural and Linguistic Adaptability and User Interfaces	SC 02 - Coded Character Sets SC 22/WG 20 – Internationalization SC 35 - User Interfaces
Data Capture land Identification Systems	SC 17 - Cards and Personal Identification SC 31 - Automatic Identification and Data Capture Techniques
Data Management Services	SC 32 - Data Management and Interchange
Document Description Languages	SC 34 - Document Description and Processing Languages
Information Interchange Media	SC 11 - Flexible Magnetic Media for Digital Data Interchange SC 23 - Optical Disk Cartridges for Information Interchange
Multimedia and Representation	SC 24 - Computer Graphics and Image Processing SC 29 - Coding of Audio, Picture, and Multimedia and Hypermedia Information
Networking and Interconnects	SC 06 - Telecommunications and Information Exchange Between Systems SC 25 - Interconnection of Information Technology Equipment
Office Equipment	SC 28 - Office Equipment
Programming Languages and Software Interfaces	SC 22 - Programming Languages, their Environments and Systems Software Interfaces
Security	SC 27 - IT Security Techniques SC 37 - Biometrics
Software and Systems Engineering	SC 07 - Software and System Engineering

Consortia / Fora

- ETSI is monitoring 489 ICT Fora

  http://www.etsi.org/forawatch/home.htm
- Some of the most actives include:
  - OASIS - Organization for the Advancement of Structured Information Standards
  - W3C - World Wide Web Consortium
  - OMG - Object Management Group
  - IETF - Internet Engineering Task Force
  - OMA - Open Mobile Alliance
  - Etc..

Internationalization of Standards

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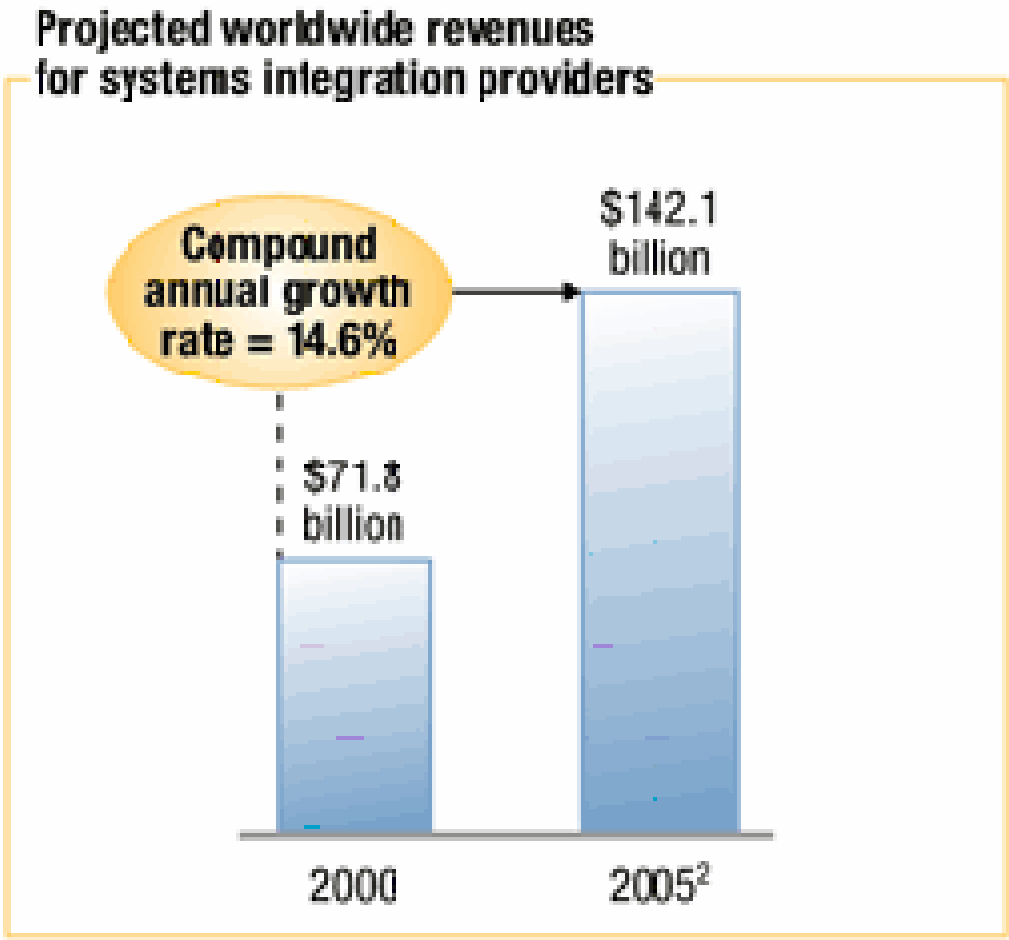
Conclusions

- ICT is important to Canada
- ICT is still evolving fast
- ICT is getting more global
- ICT standards are needed:
  - To ensure a working and reliable infrastructure
  - To foster international commerce
- A very significant part of the leading edge standardization activities occur in consortia/fora

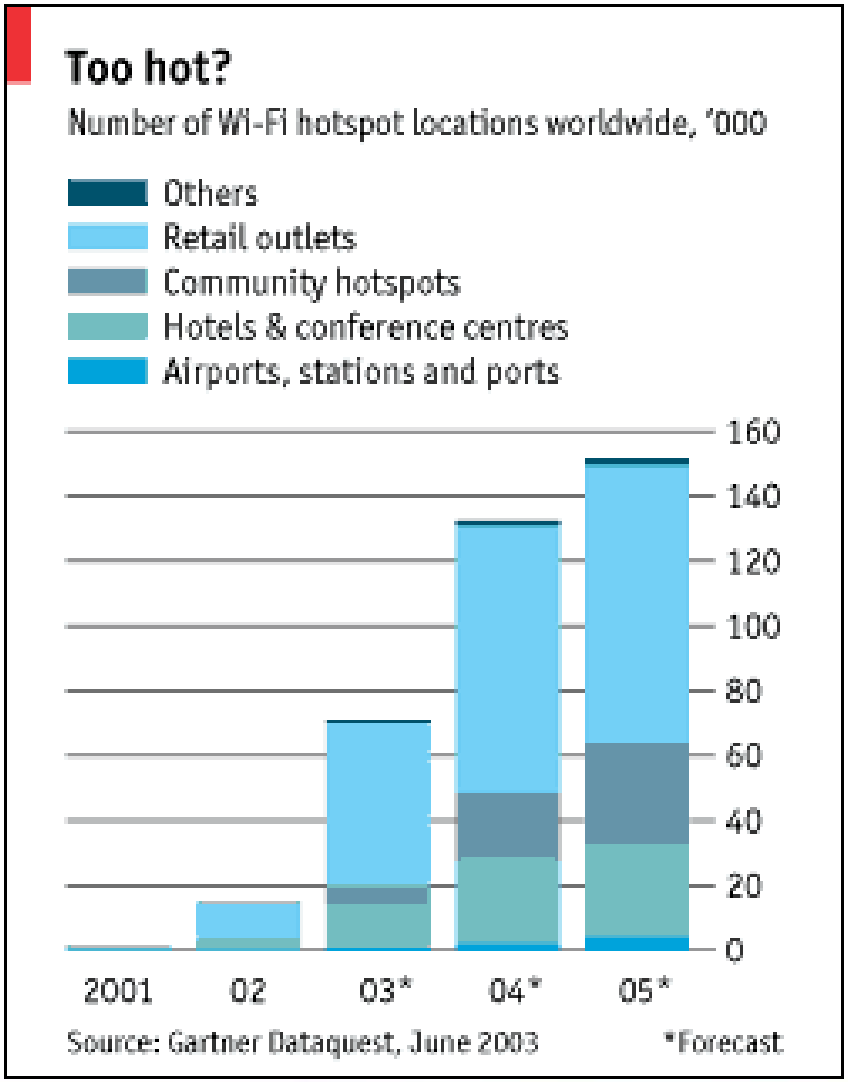
BACKUPS

The Growing Importance of Systems Integration



:Exhibit 5 of « When computers learn to talk: A Web services primer », S. Patil et S. Saigal, The McKinsey Quarterly, no 1, 2002, Web exclusive

The Accelerated Spreading of Wi-FI Hotspots



Bubble trouble

Jun 26th 2003
The Economist

Computer Games Market (billions of US $)

	2000	2001	2002	2003
Games Software	13	15	17	19
Cinema box-office receipts	18	18	19	20
DVD/Video	18	21	26	30
CDs	35	33	32	32

Console wars, Jun 20th 2002 , The Economist http://www.economist.com/displayStory.cfm?Story_ID=1189352

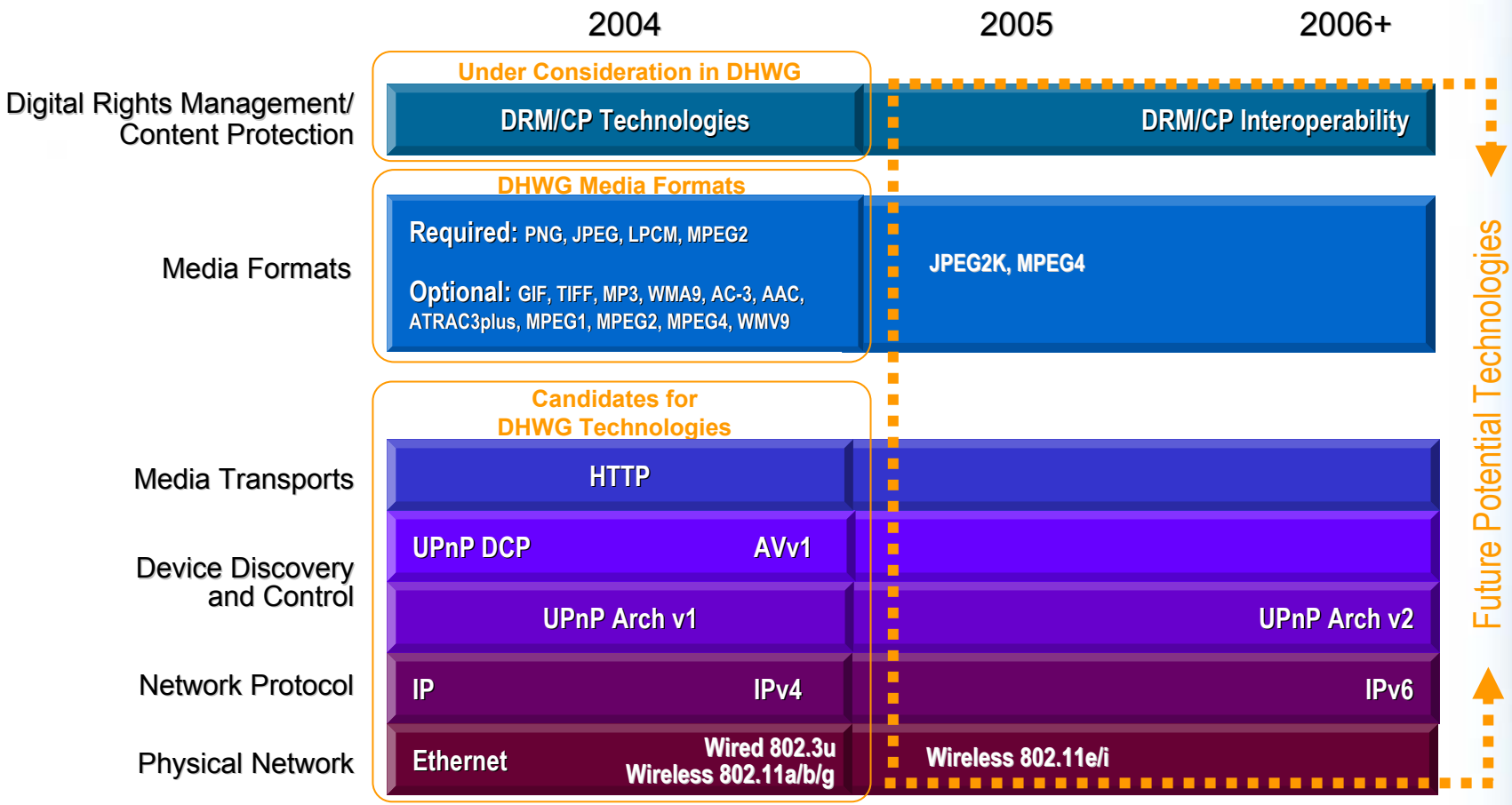
Ubiquity

Embedded Micros Worldwide Forecast
Including MPUs, MCUs, DSPs ($ billion)

Source: Gartner Dataquest 2001

From http://www.embedded.com/advert/update.htm

Digital Home Vision



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