# Challenges for Information and Communication Technology Development in the Kingdom of Saudi Arabia

**Presented by**
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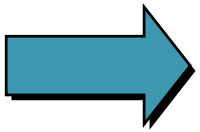
# The ICT sector has become one of the core foundations underpinning knowledge economies and sustainable development

- **The importance of knowledge in today's world**
  - Knowledge has become a core factor of production and a principal determinant of productivity and human capital advancement
  - Knowledge gap rather than the income gap is likely to be the most critical determinant of economic and social development in the future
- **The acquisition of knowledge**
  - Acquisition of knowledge has acquired a vital role in social and economic policies
  - Information and Communication Technology (ICT) plays a central role in the acquisition and dissemination of knowledge
- **The role of ICT in the acquisition of knowledge**
  - Convergence of telecommunications and computing can enable the ability to disseminate information efficiently and at reduced costs
  - Advent of ICT is changing the long-acquired conventions about the economic parameters of competitiveness and development, as it becomes the core driver behind the new technology-driven global economies

# ICT development in Saudi Arabia can support the achievement of comparable developments

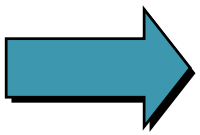
## Extracts from the Seventh Development Plan

- ***Eighth Basis Strategic Principle*** – Developing and upgrading the output of the **education** system in conformity with Islamic Sharia, the changing needs of society and the requirements of the development process



2. Updating and **developing educational curricula** and teaching methods, upgrading the level of teachers and educational aids to meet the actual needs of society
4. Placing greater emphasis on **scientific and applied research** in universities and research centers
9. Expanding the base of higher education and considering the possibility of using new educational channels such as “open university” and “distance learning”

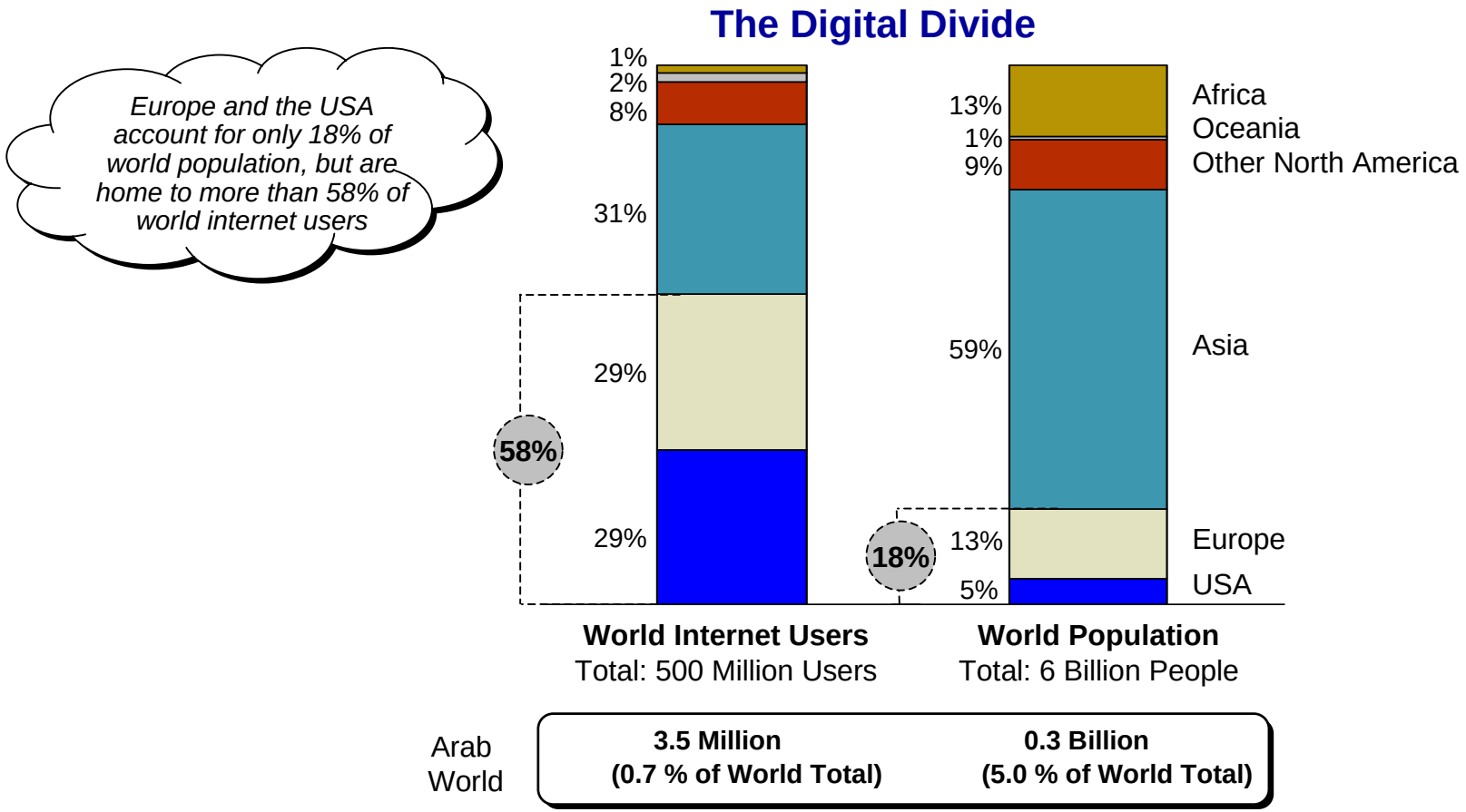
- ***Ninth Basis Strategic Principle*** – Increasing the Saudi share of total **employment** in the various economic sectors (…), as well as expanding the scope of **work for women** in accordance with the teachings of Islamic Sharia



4. Providing labor market **information** on a regular and orderly basis to enable the right choices to be made regarding appropriate trades and occupation
5. Continuing to develop suitable means to encourage the **private sector to provide job** opportunities for citizens seeking employment
7. Providing **new job opportunities for women** in conformity with the teachings of Islamic Sharia

*Source: “Seventh Development Plan”, Kingdom of Saudi Arabia Ministry of Planning*

# There is a marked digital divide among geographic regions…

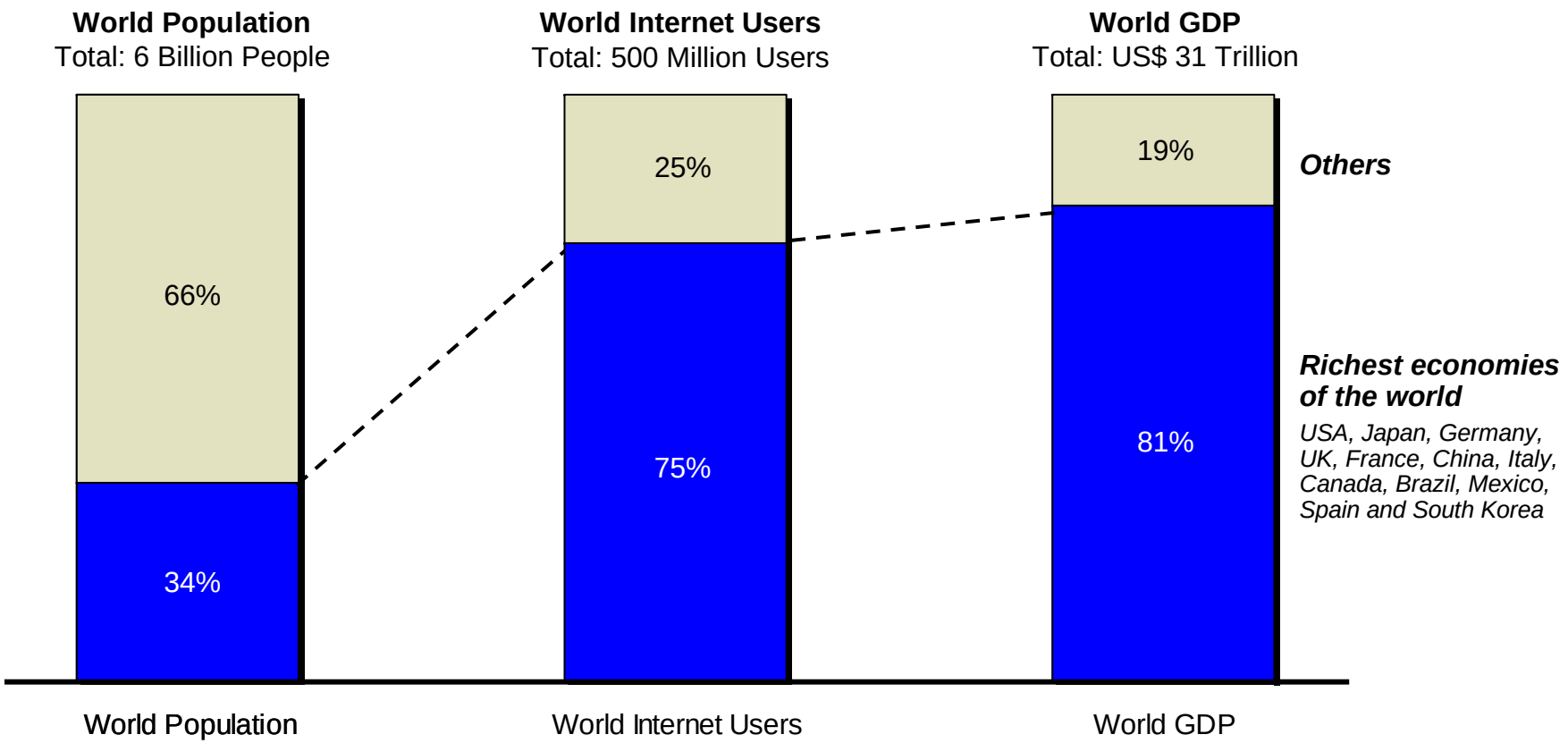



*Note: In the chart, the Arab world's total population and Internet users are split between Asia and Africa*

*Source: ITU 2002*

# … which reflects, to a great extent, socio-economic inequalities

## The Digital vs. Socio Economic Divide




*Source: US Census Bureau 2002, IMF Economic Outlook 2002, ITU 2002*

# In order to bridge this digital divide, it is essential to work along a three-dimensional ICT agenda

## Three-Dimensional ICT Agenda

**Environment**

"Environment" describes the conduciveness of the environment for ICT development. This encompasses the level of political leadership, regulatory openness, innovation, capability, I/T skills within the population, and the cost and availability of access

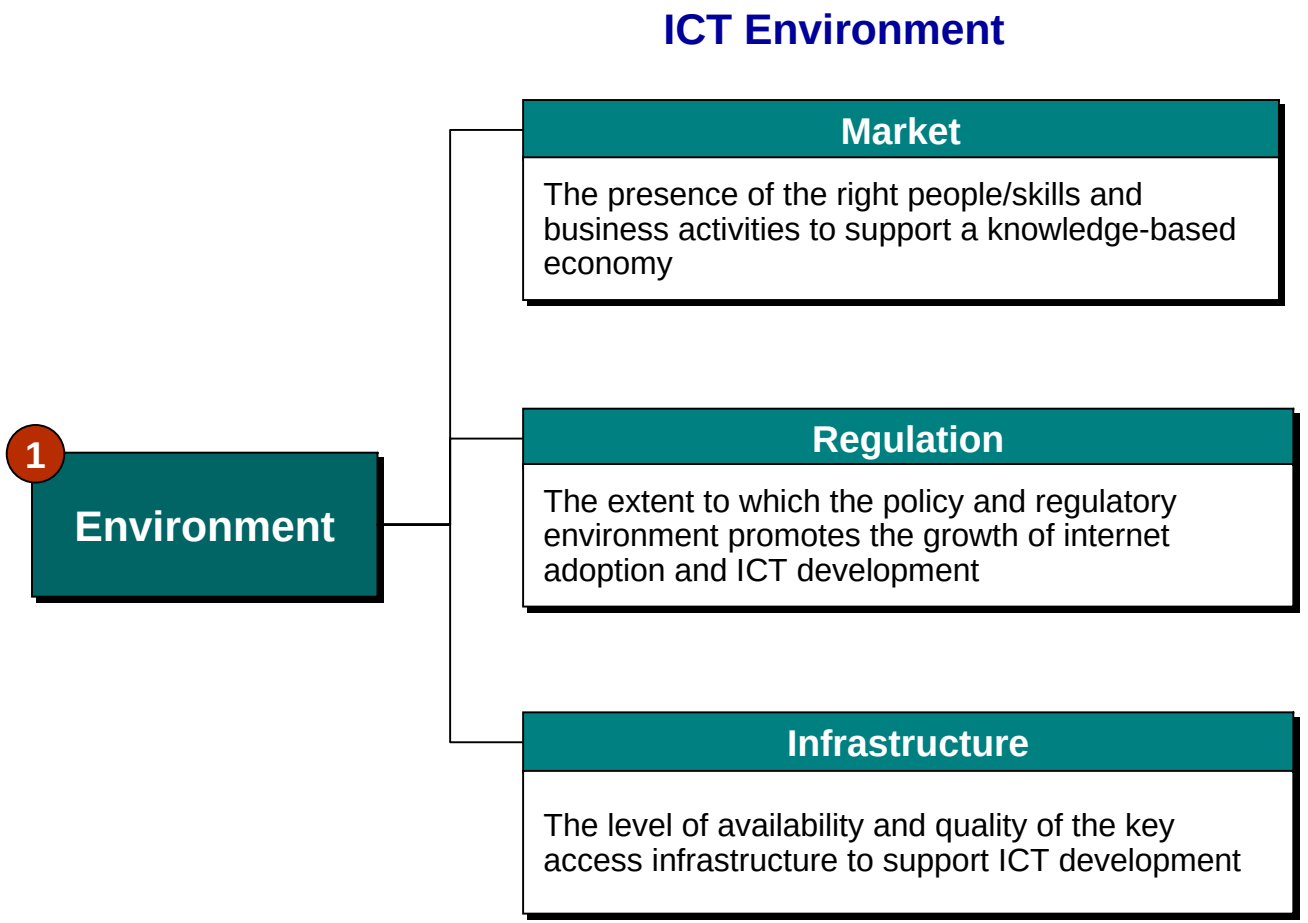
**Readiness**

"Readiness" describes the ability of a country's economic stakeholders - individuals, businesses and Governments - to capitalize on the opportunities that a strong environment brings. Readiness requires appropriate access ICT devices, be it PC, Digital TV or even a mobile telephone device, plus the skill and the desire to use it

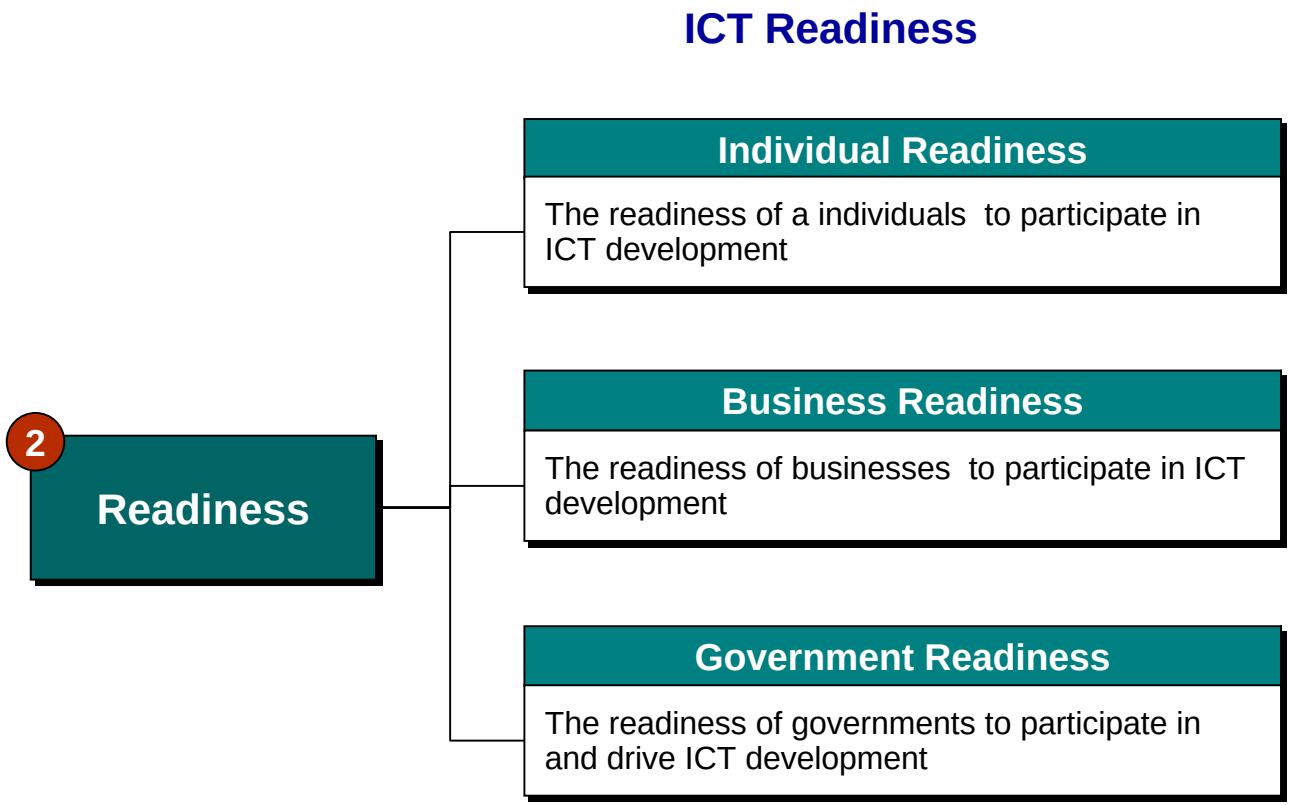
**Usage**

"Usage" describes the uptake of online services, and the volume and sophistication of use. For individuals, the sophistication of use ranges from surfing and emailing through transactions like online banking and shopping, through to publication of their own web pages. For businesses and Government, basic use is the publication of a website, more sophisticated use is characterised by transactional e-commerce applications and the integration of other business processes online

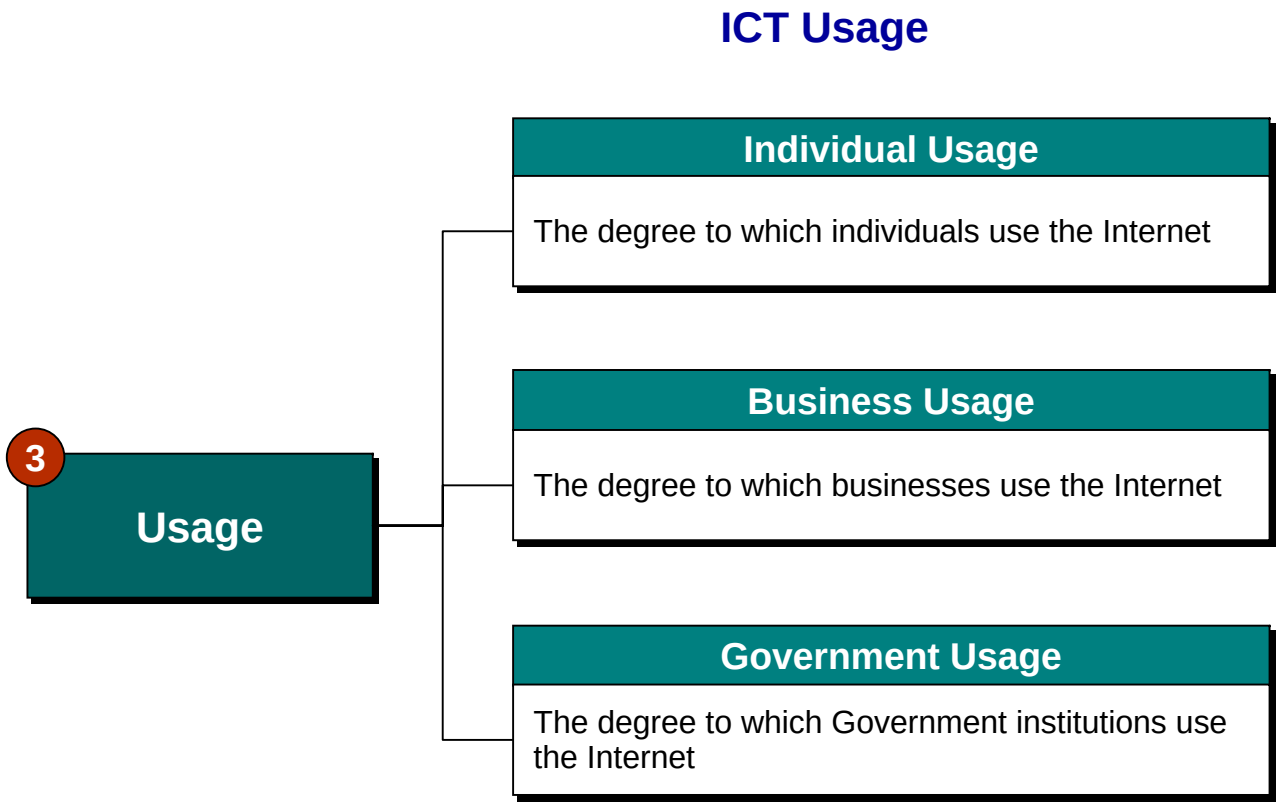
# Saudi Arabia is seeking to develop its ICT sector in a sustained fashion, focusing on creating the adequate “Environment” …



# … enabling proper “Readiness” among key stakeholders …



# … and promoting “Usage” among them



# Initial assessment suggests that Saudi Arabia ranks among emerging ICT markets in the Arab world

| ICT Clusters | Definition | Illustrative Fit |
|---|---|---|
| **Fast Track** | ▸ Already developed a clear ICT growth agenda<br>▸ Achieved adequate levels of readiness to absorb further ICT developments<br>▸ Achieved significant usage penetration levels | ▸ **United Arab Emirates** |
| **Emerging** | ▸ Have a well-developed environment for ICT growth, but have not yet acquired high levels of readiness and usage penetration<br>▸ Or, have reached significant readiness and usage patterns within an environment that lacks a predisposition for active ICT growth and development. | ▸ **Saudi Arabia, Oman** |
| **Developing** | ▸ Still lag behind other countries in the region in their efforts to bridge the digital divide<br>▸ Some have rolled-out successful ICT initiatives, despite the absence of a national integrated framework for ICT development<br>▸ Others have more recently introduced ICT tools in the market and are still developing ICT policies and national plans | ▸ **Syria, Yemen** |

# The key challenges for ICT development in Saudi Arabia are analyzed along the three main layers

## Challenges for ICT Development in the Arab World

### 1 Environment

- **Political/Regulatory Leadership**
  - Existence and leadership of a National ICT Agenda
  - Level of integration of ICT initiatives
  - Responsibility for ICT Agenda
- **Market**
  - Privatization and competition landscape

### 2 Readiness

- **Access Affordability**
  - Cost of access
    - … PC, software, etc
    - … Connection
- **Infrastructure**
  - Availability and quality of ICT access tools

### 3 Usage

- **Awareness and Universal Access**
  - Knowledge about ICT
  - Comfort with ICT usage
- **Compelling Content**
  - Language barrier
  - Content barrier

# Saudi Arabia has made significant progress over the past 2 years to set regulatory foundations for ICT development

## Abstracts of Regulatory Development (2001-2002)

- Saudi Arabia published in May 2001 the Telecommunications Act which explicitly committed the Kingdom for sector regulation and liberalization
- The Saudi Communication Commission was founded later in 2001 to enact the Telecommunications Act and regulate the sector
- The Telecommunications Bylaw was published in August 2002, with comprehensive policy outlines for adequate sector regulation
- The Council of Ministers confirmed in September 2002 the liberalization of the Mobile sector in 2004 and Fixed sector in 2008

# National programs are underway to promote ICT development in the educational sector

## Watani Project Content Scope

### Academic Curriculum

- The educational network will provide students with on-line courses for all subjects for all grades
- The educational network will link teachers to the educational sites that furnish electronic books, an electronic Teacher's Guide, model lessons and teaching methods
- The educational network will provide links to special sites and information sources that will enrich the curricula for talented students and provide real life examples. The educational network will also provide a link to a comprehensive bank of educational encyclopedic information

### School Management System

- Schools administrations will be able to use the educational network as a means of handling the school management system and exercising administrative procedures such as recording data, statistics, students' marks, student numbers per school, allotted books, and parents' communications regarding their children's performance and behavior
- The educational network will be utilized in publicizing general information, details and respective statistics of the schools and their sites

### Internet Services

- Provide Internet access at schools
- Provide email to all users
- Provide a chatting service between teachers, students, guardians, educational supervisors, school headmasters and officials

### Other Services

- Conduct contests, seminars, and competition between various schools
- Provide students with special needs with educational services

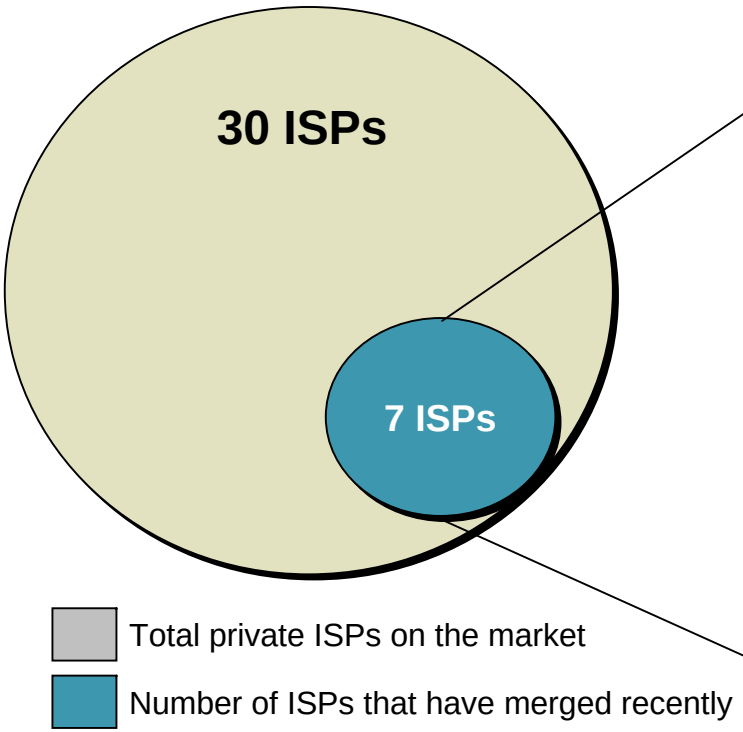
## Watani Project Targets

- 50% of Schools and Students in Saudi Arabia
- One computer for every 10 students on average

# The ISP market is already competitive and has recently experienced a wave of mergers with prospects for higher quality services at lower prices

## Recent Mergers in the Saudi ISP Market

### Private ISP Market in Saudi Arabia

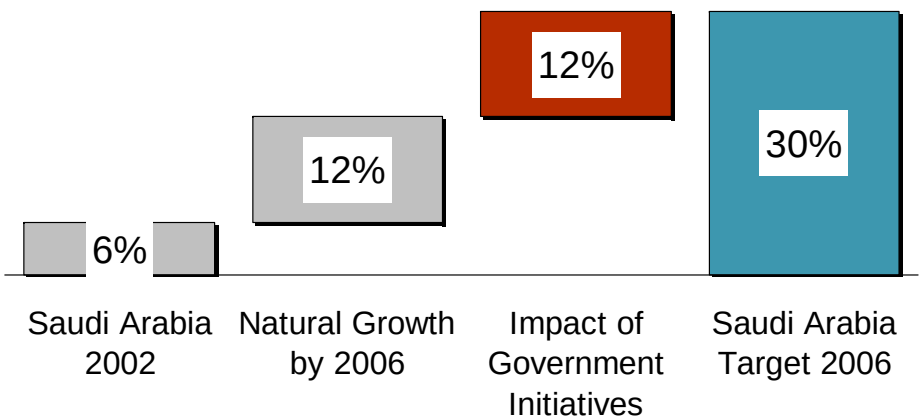



### Mergers in the ISP Market

- **Naseej**, **Awal-Net** and **Alamiyah** merged in April 2002. The alliance is said to have captured 30% of Internet users in the Kingdom
- In a continuation of the recent merger between TRInet and Dallah, a new merger agreement has been signed between **TRInet**, **OgerTel**, **Dallah Telecom** and **Nournet**, creating one of the leading ISP in Saudi Arabia. They will merge into a newly formed Holding Company that will operate under the commercial name of “Cyberia”

# The Ministry of Planning is also working on the formulation and implementation of initiatives to achieve a 30% Internet penetration

## Target for Penetration in Saudi Arabia

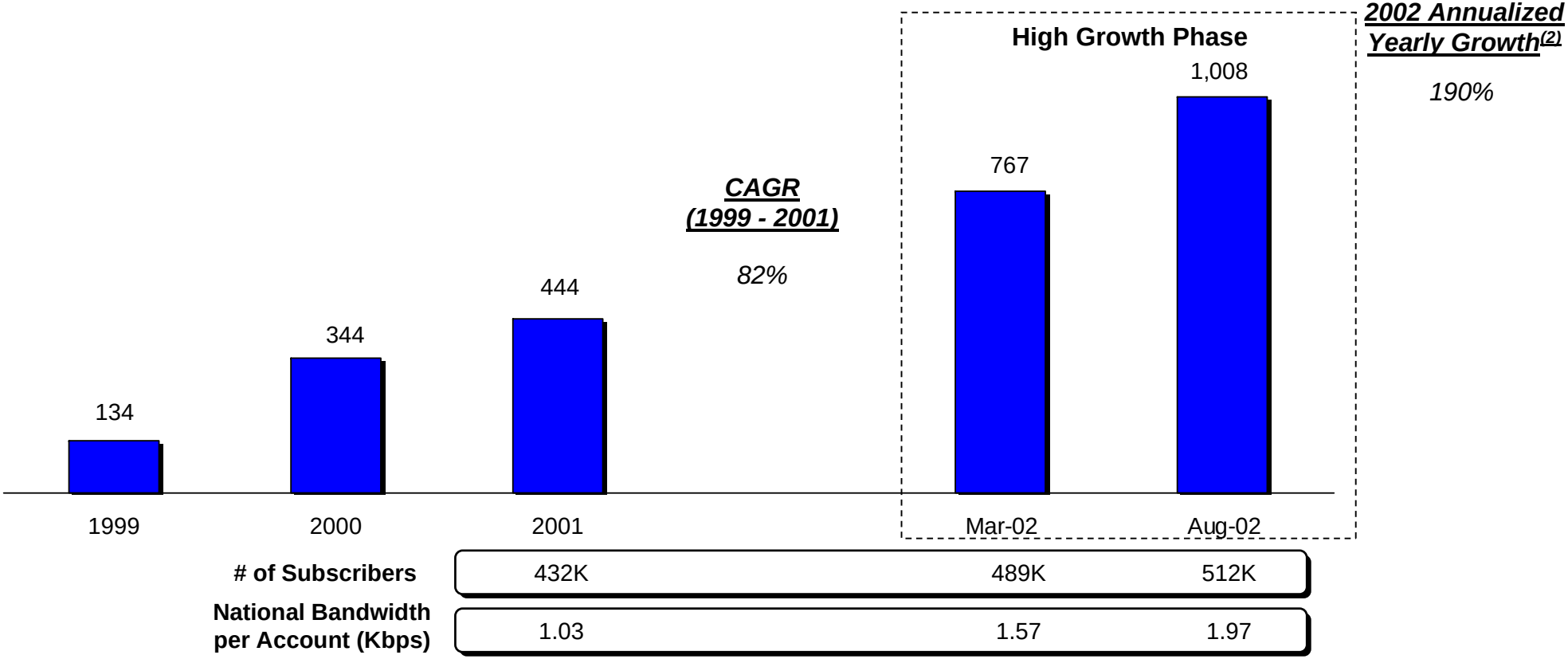



## Drivers / Barriers to Internet Penetration and Usage

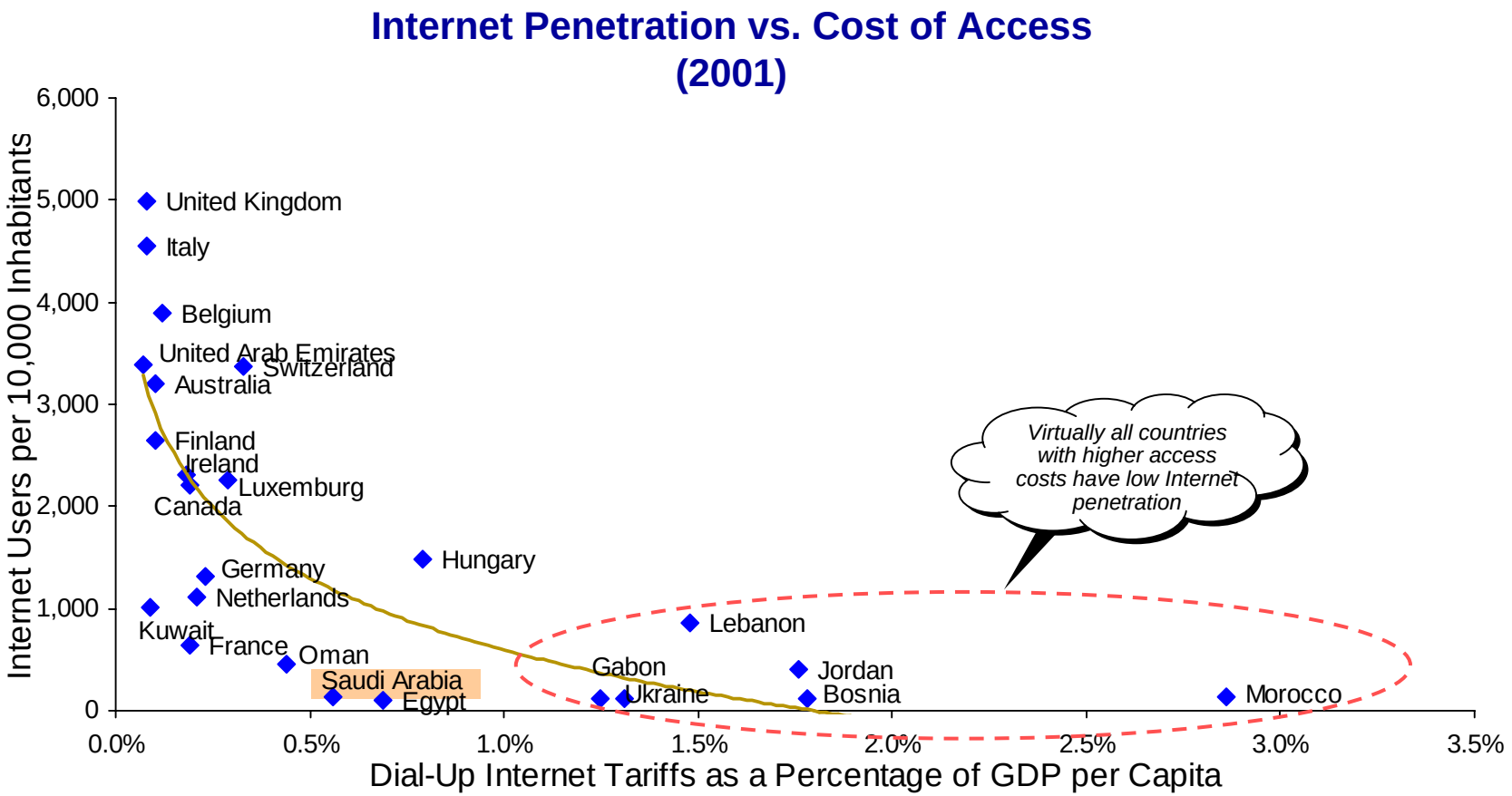
1. Availability, affordability and quality of Internet access
2. Literacy and comfort with the Internet
3. Compelling content and applications on the Internet

# Recent growth in national bandwidth acquired by ISPs has doubled the national bandwidth per account. In the process, bandwidth tariffs were reduced by more than 50% by Saudi Telecom

## Evolution of ISPs National Bandwidth in Saudi Arabia (1999-Aug 2002) (in Mbps)



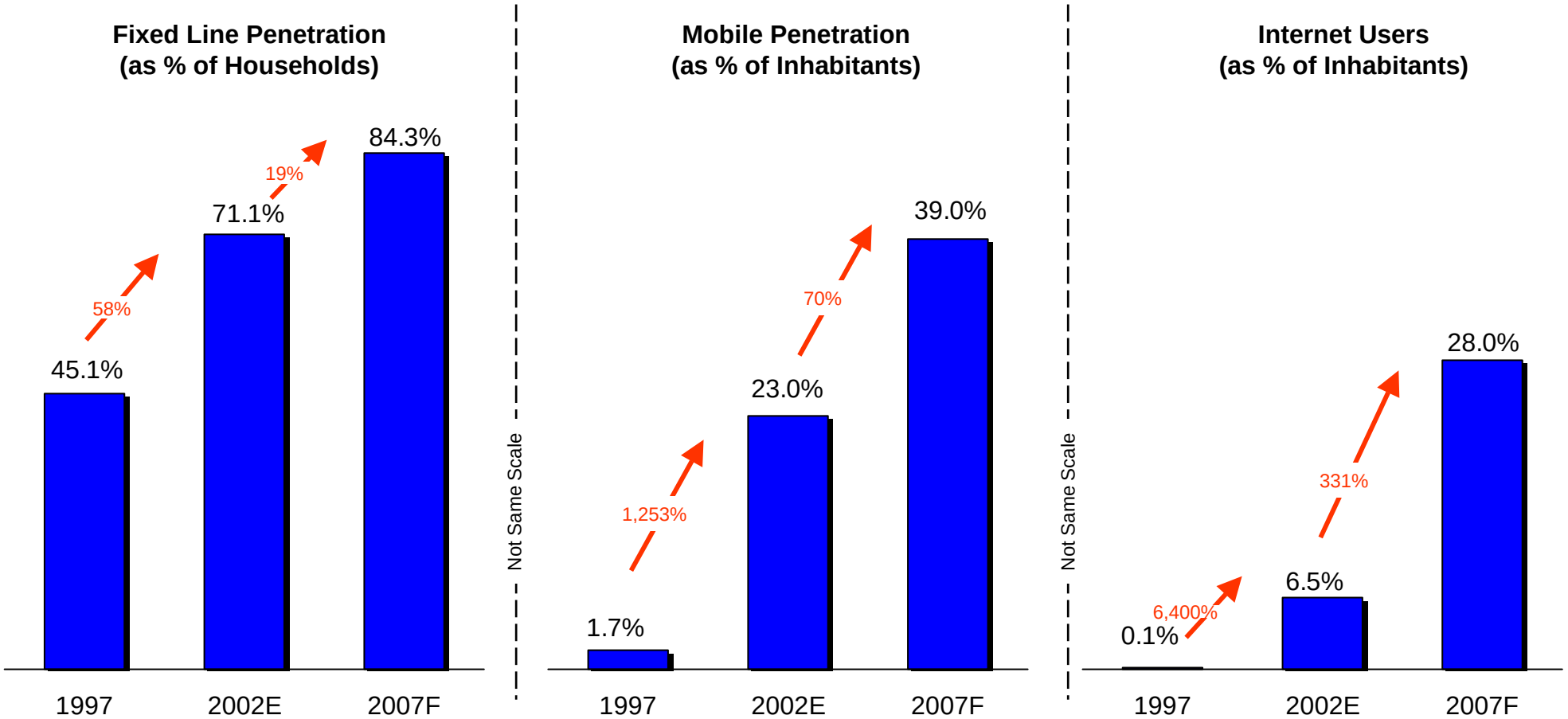
# Further reductions are required in the future to ensure that Internet services pricing reflects the economic conditions of the Kingdom




*Source: ITU 2002*

# The penetration of core telecommunications services progressed rapidly over the past 5 years, and further growth is envisaged

## Telecom Services Penetration in Saudi Arabia (1997-2007)




*(1) Internet Users is defined as number of Internet accounts times a user multiplier per account, set a 2.5 for Saudi Arabia based on national level research conducted in 2001*

# Saudi Telecom has built a multi-layered network based on an ATM core to facilitate seamless integration and provide multiple services

## Saudi Telecom Fixed Network Architecture

The heart of the network. With ATM technology at the core, the network is able to transport different types of traffic such as voice, data and video using the same infrastructure

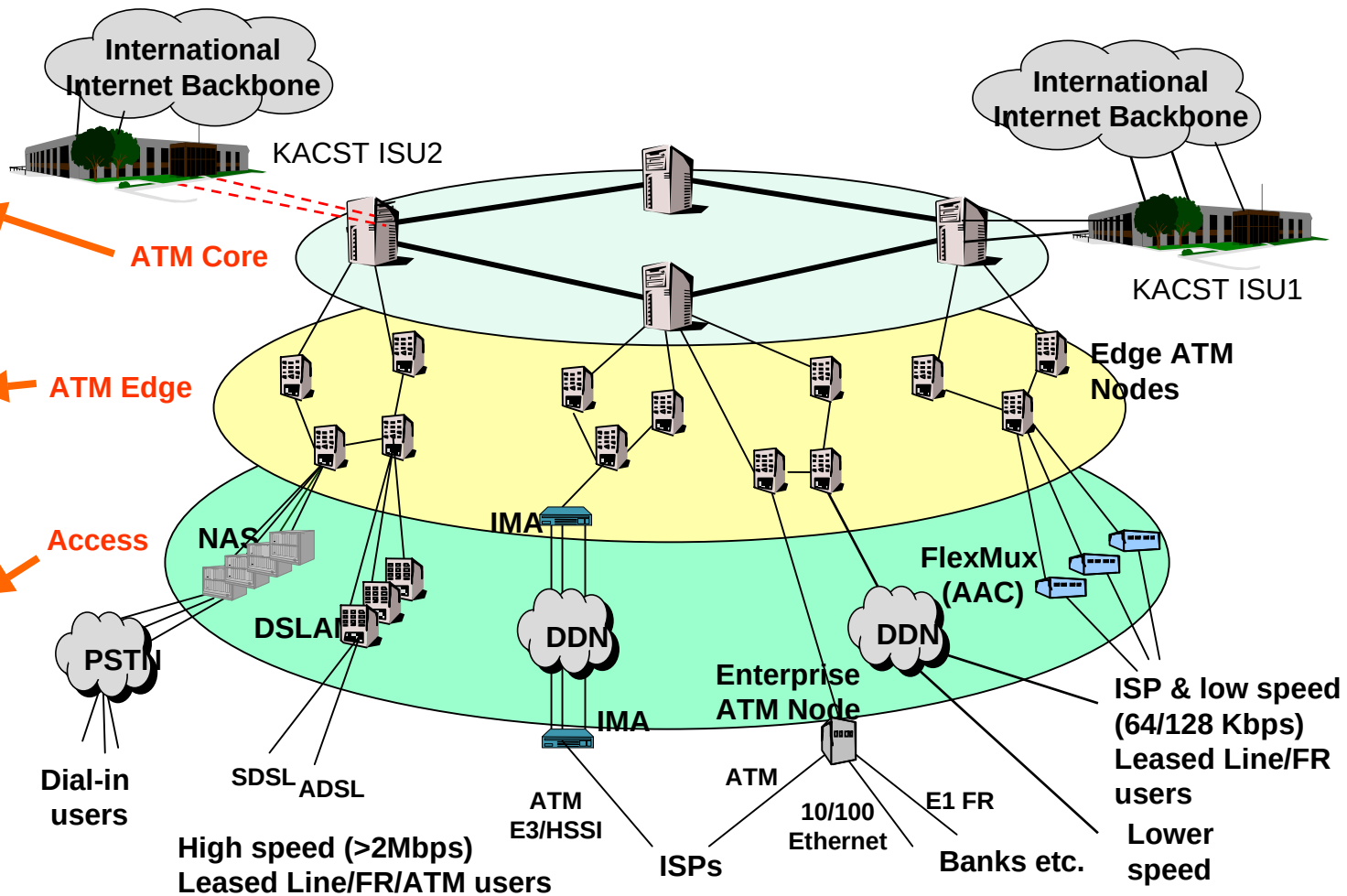
**ATM Core**

The middle layer used to connect the access nodes to the core network. In addition, large customers may be connected directly to the edge network bypassing the access layer

**ATM Edge**

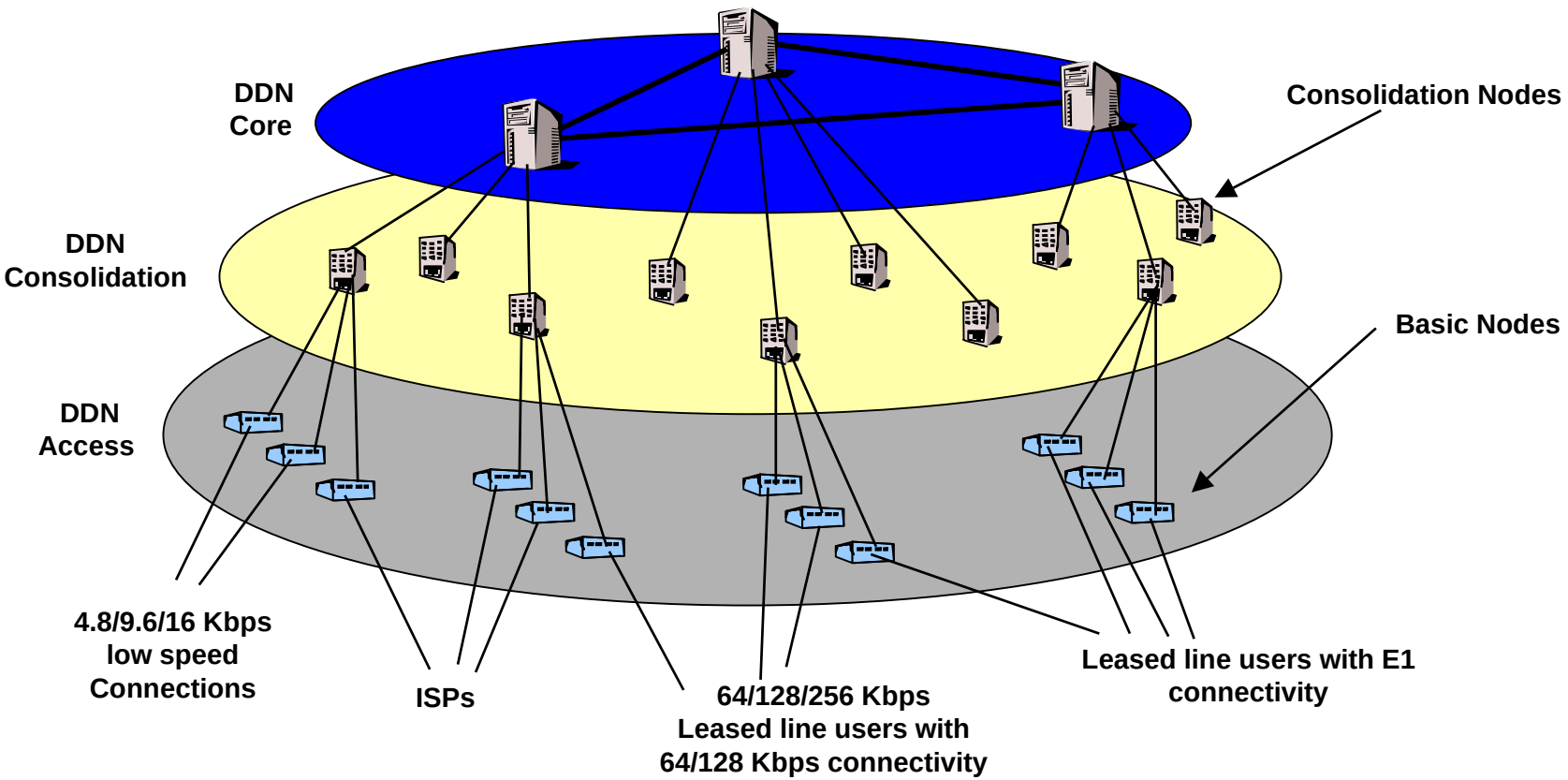
The interface between the network and the customer. Different services are accessed via different networks; for example, mobile via GSM, voice telephony via PSTN and Data services via DDN

**Access**



# A digital data network was deployed as a stand-alone structure for rapid provisioning of leased lines for electronic data interchange

## Saudi Telecom DDN Network Architecture



# A fully meshed IP-VPN(1) network is under consideration to connect the schools network. Saudi Telecom is additionally providing a 30% discount for educational institutions

## STC Recommended Network Topology for National Educational Network

**Access Points**

***School Access***

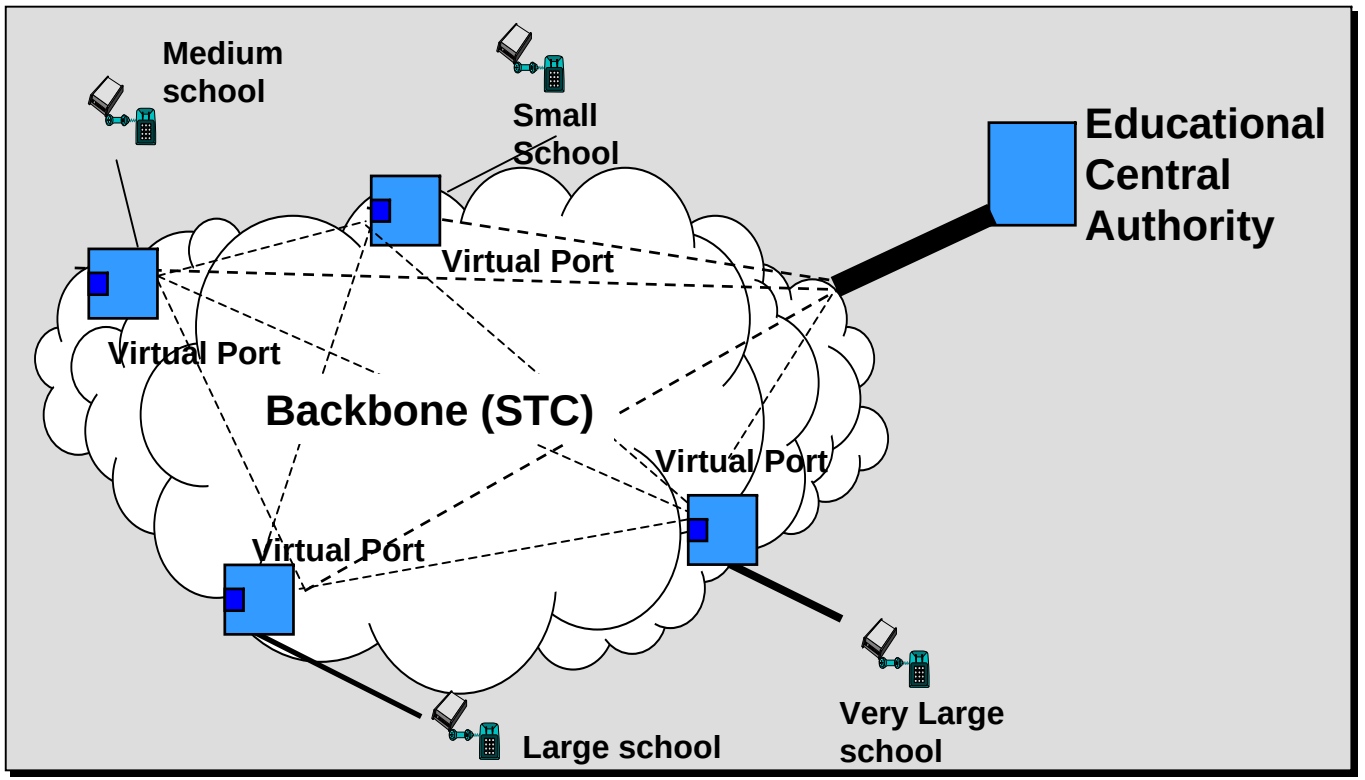
- 4,177 schools connected at 128 kbps
- 3,923 schools connected at 256 kbps
- 2,130 schools connected at 512 kbps
- 407 schools connected at 1024 kbps

***Educational Authority Access***

- 3 STM-1s

***Access Pricing***

- 30% discount on STC tariffs

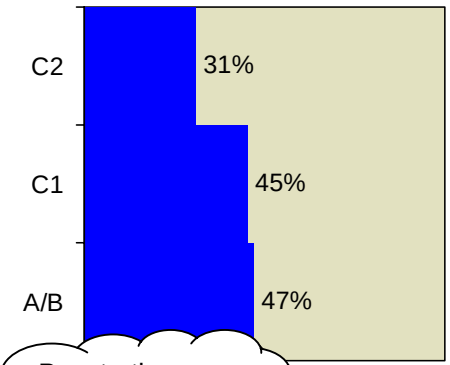



*(1) The Internet Protocol based Virtual Private Network uses the MPLS standard*

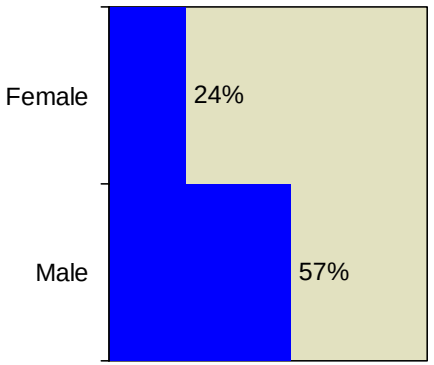
# A key challenge will be the inclusion of all groups in future ICT development efforts to mitigate the existing "digital divide"

## Percent of Saudi Nationals Claiming to Use the Internet

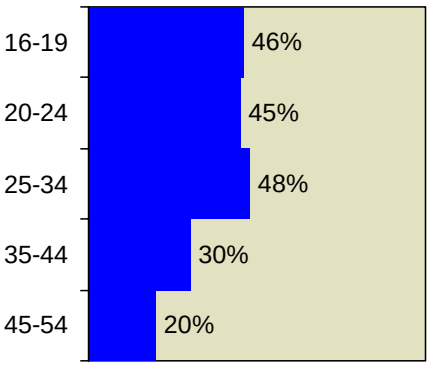
### By social class



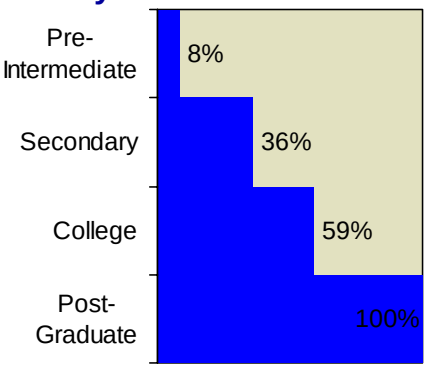

### By gender




### By age



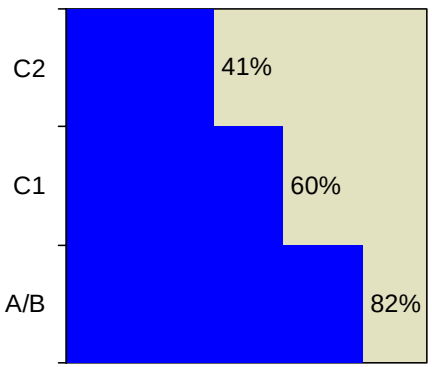

### By education level



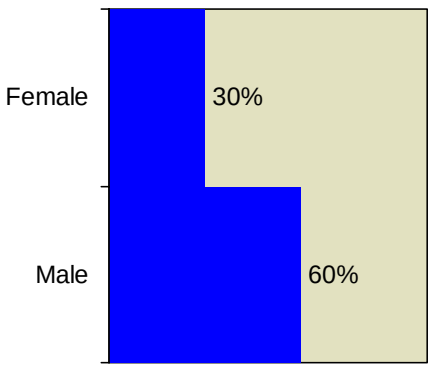

Penetration may be overstated by 20% to 30%

## Percent of Expatriates Claiming to use the Internet

### By social class




### By gender

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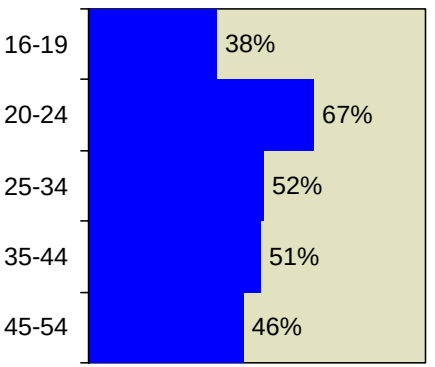
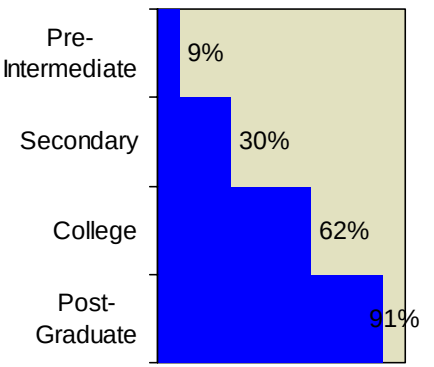



### By education level

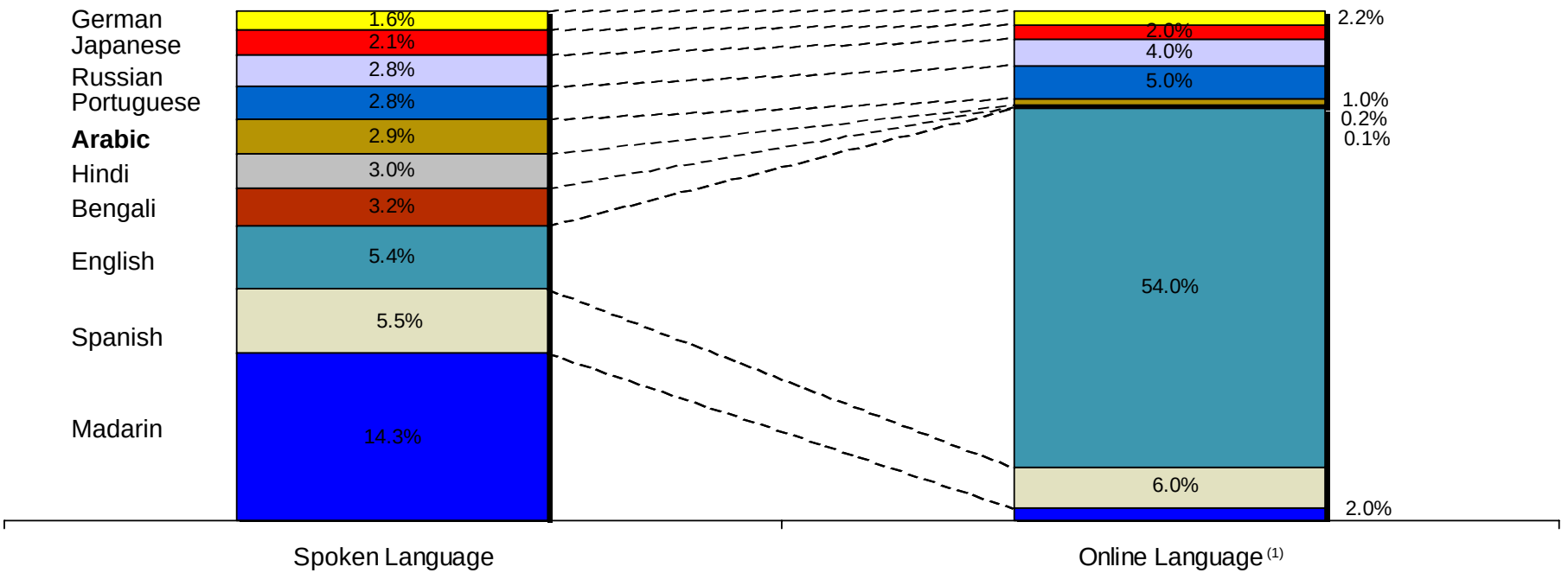



Note: (1) Portion of interviewees answering YES to question "Do you personally currently use the Internet from home, work or anywhere else?"

*Source: ACNielsen AMER 2001*

# Even though Arabic is the sixth most spoken language in the world, the share of Arabic content on the Internet remains as low as 1%

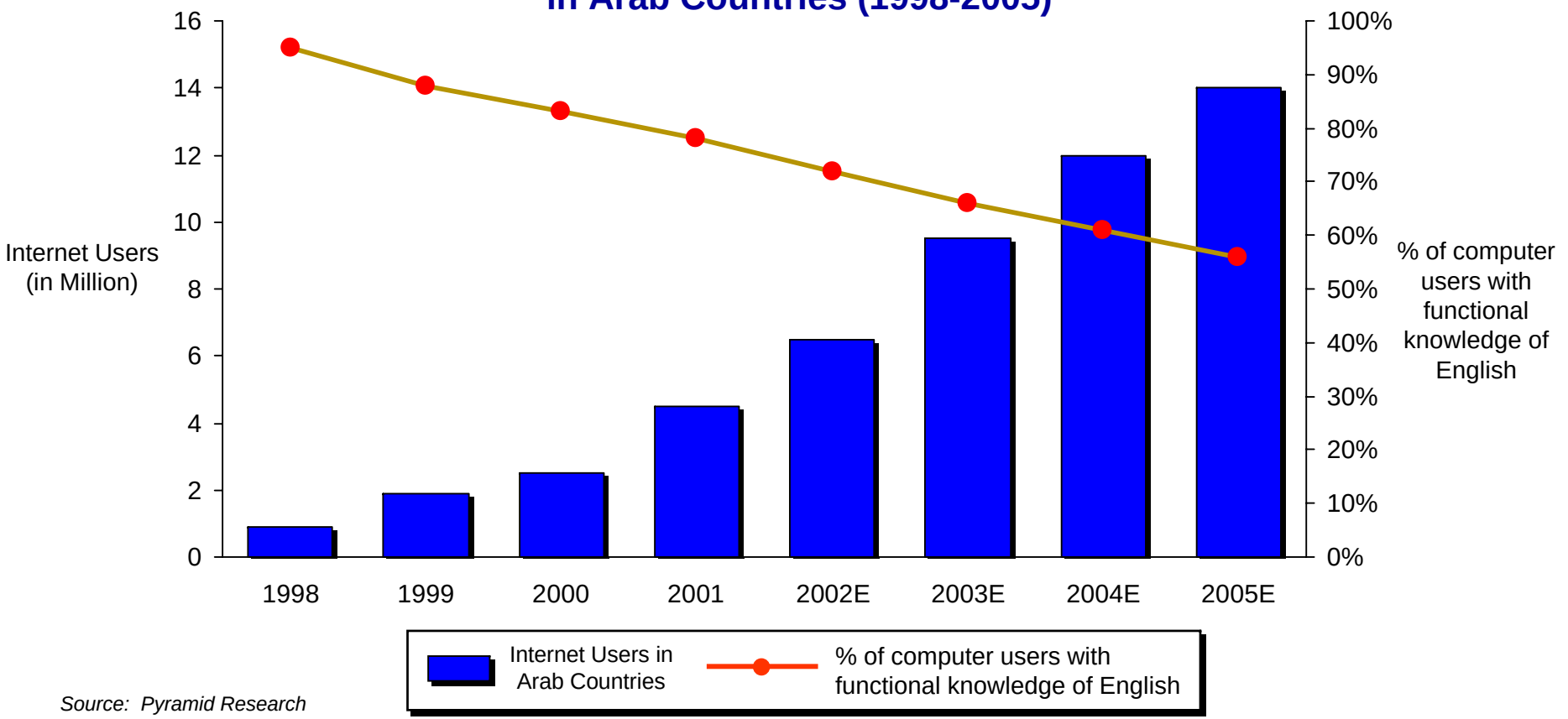
## Top 10 Spoken Languages vs. Online Languages




*(1) Some people access the Internet with more than one language*
*Source: ITU 2002*

# New ICT users are likely to come from new social classes with limited knowledge of foreign languages, accentuating, therefore, the need for Arabic content

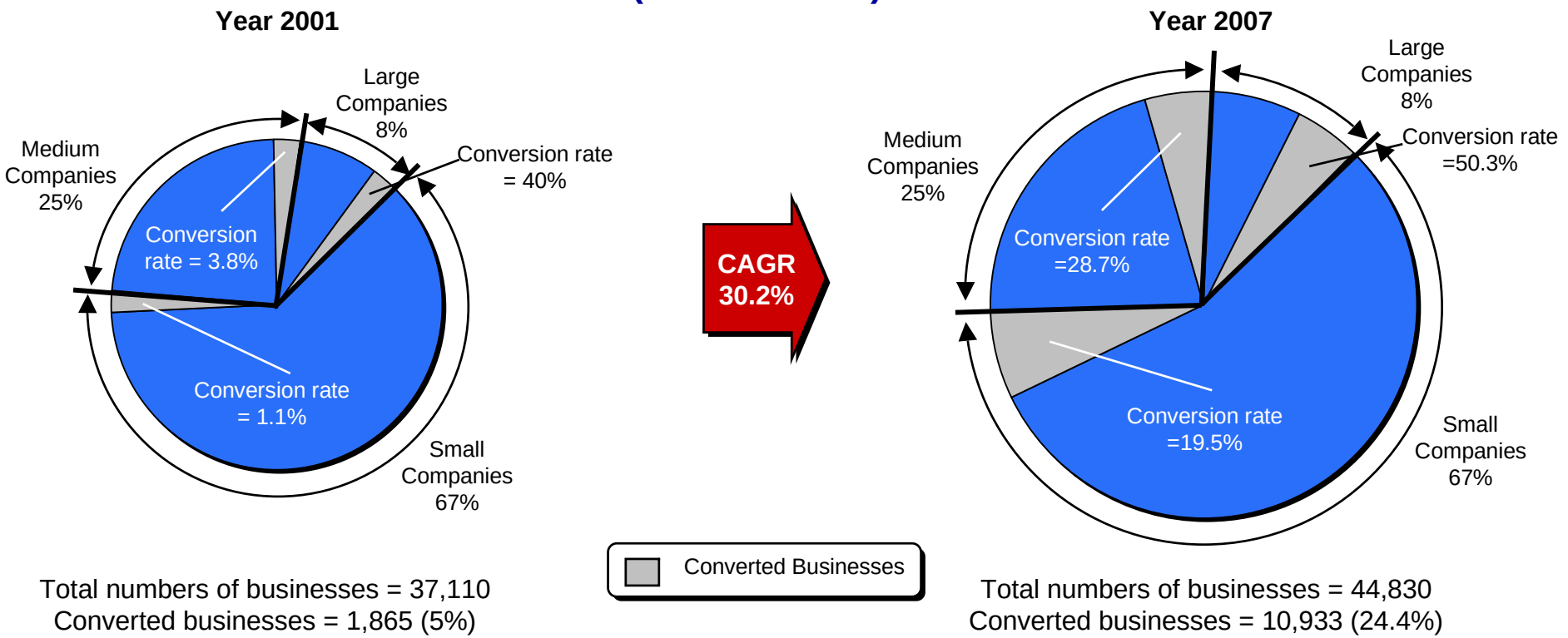
## Forecasted Internet Users and English Speaking Computer Users in Arab Countries (1998-2005)




*Source: Pyramid Research*

# ICT growth potential is significant, as illustrated by the forecasted increase in the uptake of Data Access services by businesses

## Saudi Businesses Growth and Conversion to Data Services (Subscribing Businesses / Total Businesses) (2001 vs. 2007)




Total numbers of businesses = 37,110
Converted businesses = 1,865 (5%)

Total numbers of businesses = 44,830
Converted businesses = 10,933 (24.4%)

*Source: CCFI 2000; Saudi Telecom Strategic Plan*

# Saudi Arabia will continue to strive in developing and implementing its roadmap for ICT development

## Summary of ICT Development Initiatives in Saudi Arabia

**Environment**

1. Formulation of national plan for ICT development
2. Sustained regulatory development for increased market liberalization
3. Sustained efforts for infrastructure development

**Readiness**

4. Reducing cost of access (hardware & software, telecommunications)
5. Encourage uptake of ICT tools and skills
   - Among businesses and government institutions
   - Among individuals at home and in educational institutions

**Usage**

6. Creating incentives for usage (e.g., e-government, e-commerce, e-education)
7. Overcoming language barriers though parallel efforts to develop Arabic content and increase conversance with English language