

# eBanking & eFinance for Lebanon

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# eBanking & eFinance for Lebanon

- Changing World of Financial Services
- Potential Growth and Impact of eFinance
- Implications for Financial Sector Development
- Requirements for e-Commerce
- Impact on Lebanon & Emerging Markets
- Laws & Regulations
- The SeBIL Project

# Changing World of Financial Services [1]

Three major factors affecting financial services:

1. **Globalization**: increase in capital flows, cross-border financial services, migration of trading/listing offshore:
  - Leading to increasing economic integration
  - Resulting in greater trade in financial services
2. **Deregulation**: geographic, markets and products:
  - New entry and increase of foreign presence in many domestic markets
  - Integrated banks offering a broad array of services
3. Technological progress in **Information & Communications Technology**, particularly internet

# Changing World of Financial Services [2]

These factors are:

- Changing industrial structure for financial services (products and markets)
- Reducing costs of producing financial services
- Providing new delivery channels
- Providing large potential benefits to consumers and corporate clients

# Technology Changing industrial structure of Financial Services

- Entry of new specialized financial service providers
- Entry of non-bank entities (telecoms/utilities)
- Consolidation around recognized brand names
- Emergence of mixed financial and non-financial conglomerates
- Globalization of markets and trading systems

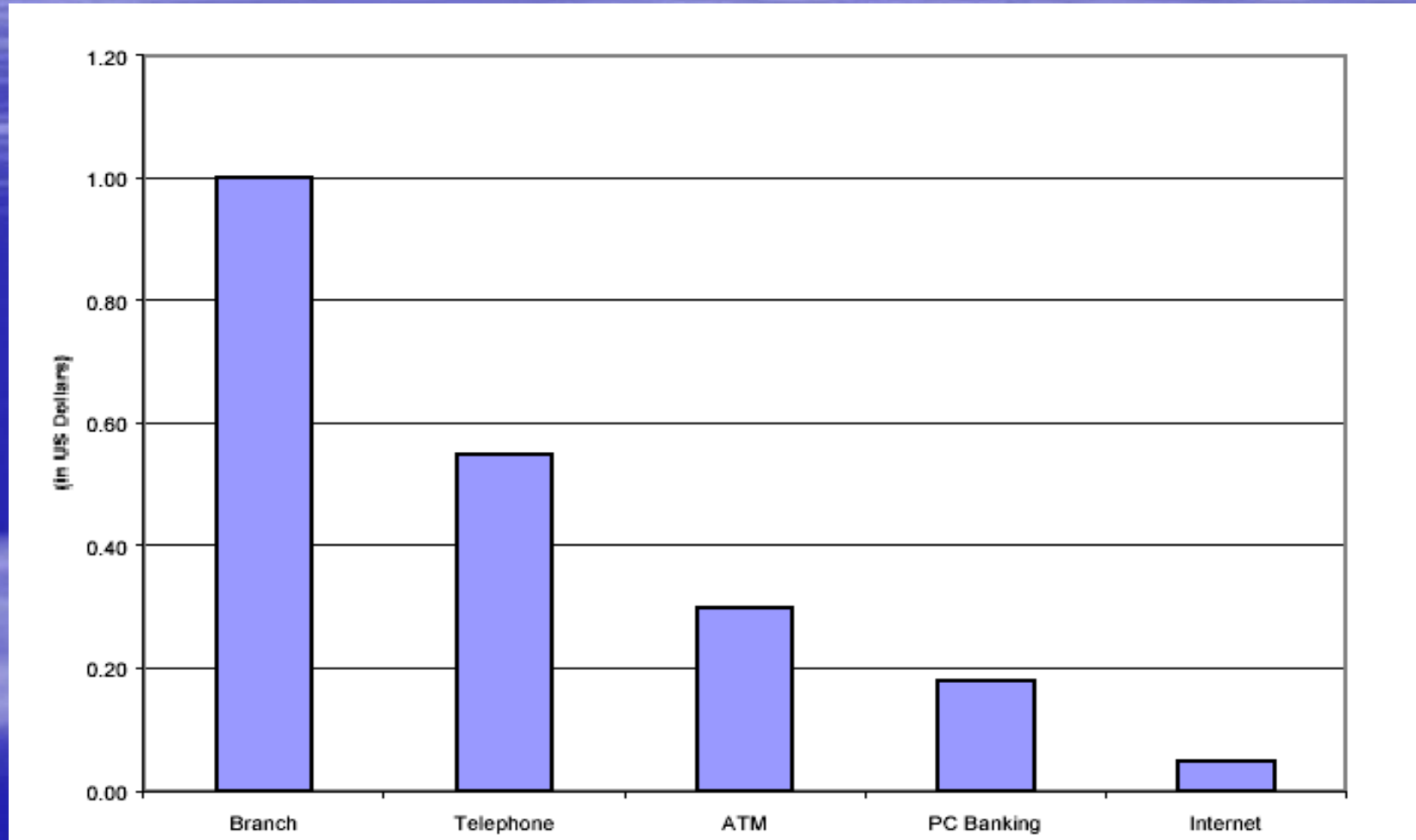
# Changing Cost of Financial Service Provision

- Reductions in technology and communications costs underway for some time
- Internet and e-finance **adds new dimension:**
  - allows for new, low-cost distribution channel
  - reduces processing and labor costs,
  - reduces possible mistakes, allows easier Straight Through Processing (STP)
  - allows for better and more cost effective customer stratification and personalized pricing
  - permits unbundling of financial products and commoditization of many services
  - permits application of credit scoring and Client Relation Management (CRM)
  - lowers barriers to entry into certain product segments and reduces barriers across borders

# Benefits to Consumers of Financial Services

- Benefits to retail consumers
  - Reduction in transactions costs
  - Improvement in access (to wider set of financial services), with better quality and greater reliability of service
  - Better speed and timeliness of information (information asymmetries reduced)
- Benefits to business
  - Reduction in financial, transaction, search and monitoring costs
  - Access to larger set of financial services
  - Widening of access to financial services, also for SMEs

# Technology Reducing Cost of Financial Services



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# The State of Affairs and Potential Growth of E-Finance

- State of affairs
  - Convergence in approaches across the globe
  - Penetration of e-finance growing
  - Greater connectivity worldwide, business environment improving—but slow in Middle East & Arab countries
- Potential growth
  - Potential is large, but start of high growth will vary by country
  - Takeoff point (start high growth period) depends on business environment, connectivity, general framework for financial services and competition
  - Estimated takeoff point may vary from today for Nordic countries to 2007 for Russia, to 2005 in Lebanon and advanced Arab countries

# Potential Penetration and Impact of E-finance (WB estimates)

- Current trends imply penetration of e-finance will increase, sharply in some countries
  - Banking. From 8.5% today to 50% in 2005 for developed countries; from 1% to 10% in emerging markets.
  - Brokerage. From 28% today to 80% in 2005 for developed countries; from 1.5% to 15% in emerging markets
- Impact on costs and revenues can be large for incumbent financial services providers
  - Banking margins. Developed countries: can decline from 2.3 percentage points today to 2.0 in 2005 and 1.7 in 2010.
  - Emerging markets: can decline from 4.4 percentage points to 3.9 in 2005, and 2.5 by 2010;
  - Brokerage revenues: can fall by half in industrial countries and by one-third in emerging markets.

# Impact on Emerging Markets (WB)

- E-finance is growing rapidly in many emerging markets:
  - many financial institutions are using best practice e-finance approaches, e.g., best banks in Brazil rival US banks
  - on-line brokerage expanding fast, e.g., in Korea more than 2/3;
  - many new trading systems being introduced; migration of listing and trading offshore rapid in some markets;
  - small markets and lack of institutional setups can allow for rapid progress, e.g., Estonia
  - forms of e-finance vary, e.g., more mobile (cell-phone) solutions in emerging markets
  - demand and institutional factors major constraint to growth

# Implications for financial sector development model

General leapfrogging not easy, but changes call for

- Revise Model of financial sector development
- Role of government to change: more proactive, but monitor increased risk
- Public policy needs to adjust in other areas:
- Focus on actions to develop preconditions:
  - infrastructure (telecommunications)
  - law and regulations
  - Security
  - competition policies
- From institutional to more functional approach to regulation and supervision

# Changes in the model of financial sector development

<i>Areas</i>	<i>Current Paradigm</i>	<i>New Paradigm</i>	<i>Working Groups</i>
<b>A. Creating an enabling environment</b>			
• Regulatory framework for telecommunications	⊗	■	✓
• Security framework and PKI infrastructure	⊗	■	✓
• Framework for information and privacy	✓	■	✓
• Framework for contract enforcement	✓	■	✓
• Financial system laws that are institution specific	■	◆	◆
• Market infrastructure	■	◆	◆
<b>B. Risks: At the Institution, Product or Consumer Level</b>			
• Consumer protection	◆	■	✓
• Investor protection	◆	■	✓
• Prudential Regulation	■	◆	■
<b>C. Markets: Conduct/Functioning, Performance, Risks</b>			
• Competition policy	✓	■	⊗
• Functioning, fragmentation & volatility	◆	■	✓
• Rules for markets, liquidity, transparency, access	◆	■	✓
• Disturbances, liquidity risks, stress Properties.	◆	■	✓
<b>D. Forms of Government Intervention</b>			
• Development banks, public micro-lending institutions and directed credit	◆	✓	⊗
• Information provision and “collateral” institutions	◆	■	⊗
• Modifying use of existing institutional infrastructure	◆	■	⊗

⊗ Not important or not addressed    ✓ Somewhat important    ◆ Important    ■ Very important

*Source:* Authors assessment and for Working Group column various reports issued by international agencies (see Annex 4: International Working Group Summaries).

# Changes in Model and Role of Government

- Financial sector development paradigm:
  - Reassess approach to financial regulation and supervision and approach to ensuring that the financial sector safety net is not extended
- Role for government to change:
  - More focus on enabling environment: basic legal, information, and communications infrastructure
  - Less need for direct government interventions
  - Government to become an enabler, e.g., • sharing information itself; creative use of existing infrastructure (e.g., Post Offices); developing networks; settings standards

# Communications Infrastructure

- Efficient telecomm. infrastructure with wide and fast access is key:
  - to deliver financial services widely in efficient/cheapest way
  - to encourage new entry in financial services provision
- Objective: improve connectivity
  - Privatize PTT/Telecomms
  - Introduce an independent/ accountable regulatory authority
  - Improve licensing of competitive operators
  - Impose mandatory interconnections
  - Develop price regulations
  - Reduce international trade barriers
  - Special incentives for rural/remote Areas

# Implications for Public Policy in the Areas of

- Safety and soundness regulations
- Competition policy
- Consumer protection
- Regional & Global public policies



# Safety and Soundness

Over long run, need to reconsider safety net:

- Banks no longer “special”:
  - Many substitutes for bank deposits and loans have emerged
  - Advances in information technology are reducing information asymmetries
- Will allow for substantial reduction of safety net
- Consequently, nature & form of prudential regulation and supervision needs revision

# Safety and Soundness [2]

Over short run, need to prevent extension of safety net to deposit substitutes and non-deposit related activities:

- Authorities should not extend deposit insurance or other regulation to stored-value cards

- Authorities should require financial services providers with non deposit taking activities to adopt either holding company structure or narrow bank

- Authorities should require non-financial corporations to offer payment services through bank subsidiary (e.g. Lebanon)

# Safety and Soundness [3]

Developments may have adverse impacts on financial stability:

Existing financial services providers will see decline in their franchise value

Problematic in de-capitalized banking systems with weak supervisory structures and extensive guarantees

Need to reduce extensive guarantees and strengthen failure resolution mechanism

# Competition Policy

- Reduction of safety net allows for more active competition policy and requires more harmonization of competition policy across countries. But, market and product definition will be more difficult.
- Barriers to entry may arise from:
  - Sunk costs of investment
  - Network externalities
  - Links between banking and commerce or vertical integration
  - Economies of scale and scope
- Need for an overall information and technology policy

## Characteristics of financial service provision in an internet world

	Economies of Scale	Commoditization	Up-front costs; branding, advertising	Network externalities
<b>Retail services</b>				
Payment	**	****	**	****
Lending/mortgage	**	****	**	*
Discount brokerage services	**	****	***	**
Investment advice	**	***	****	**
Mutual funds	**	***	***	**
Insurance	**	***	***	**
<b>Wholesale services</b>				
Commercial lending				
-large size	**	***	**	*
-medium size	***	***	**	*
Corporate services including underwriting, M & A advice, and risk management	**	**	****	*
Large value payment systems	***	***	****	****
<b>Markets</b>				
Trading systems/exchanges	**	****	***	****
B2B exchanges	**	****	**	****
<b>New Services</b>				
E-payment providers	**	***	**	****
Enablers	**	**	**	***
Financial portals	*	*	***	****
Aggregators	**	***	**	**
None *, Low **, Medium ***, High ****				

# Consumer Protection

## Maintaining Security

Legal changes and digitalized signatures

Pre-certification

## Maintaining Privacy

Banking secrecy laws

Technology and credit bureaus

Need for a global standard

## Investor protection:

Will grow more complex despite improvements in transparency

Need more Investor education via disclosures

# Legal Framework & Enforcement

- **Objective: Simplify Legal Framework and Improve Enforcement**
  - Global framework issues
    - Cross Border Issues and Dispute Resolution
    - Large disparity in criminal and civil penalties
    - Privacy, Consumer Protection, Securities and Banking Law, Treatment of Vendors—such as ISPs or Hosting Companies
- Opportunities using technology:
  - Can technology improve collateral and foreclosure processes?
  - Can technology improve contract enforcement?
    - Requirements for Enforcement
  - Electronic Audit Trails: ISPs, Hosts, Portals, Mobile Phones
  - Electronic Forensics and investigations

# Impact on Emerging Markets [1]

- E-finance and related e-commerce and overall penetration is growing rapidly
- Potential constraints:
  - Telecom Sector
  - Overall legal and regulatory framework and information and technology policy
  - Competition
- E-finance has the potential to
  - Improve quality of financial services
  - Improve scope of financial instruments offered and venues for trading risks and widen access
  - Offer more cost-effective delivery of services to a much greater set of retail and commercial clients



# Impact on Emerging Markets [2]

- Financial Sector Development: A new paradigm
  - Substantially reduce safety net
  - Reassess approach to financial regulation and supervision
- Focus on reforms in basic legal, information, and technology infrastructure

# Regional/ Global public policy dimensions

- Access to cross-border financial services raises the following issues:
  - Single license (passport) with home rule regulation
  - Country standards and jurisdictions
  - Greater use of technology and networks with externalities involves operational and other risks and need for more coordination
- Market disturbances could increase:
  - Easier spread of misinformation and commoditization
  - imply more capital flow volatility
  - Herding, contagion, and susceptibility to spurious currency attacks may increase
- – Capital account restrictions more difficult to enforce

## Global Internet Bank Offerings

Country	% of Banks Offering Online Banking	% of Banks' Customers Using Online Banking	% of Inhabitants with Mobile Phones	Computers with IP Address Connected to the Internet, per 10,000 People
The Americas				
U.S.	63	4	26	975
Mexico	<10	<1	3	9
Argentina	4	3	8	16
Brazil	<50	5	5	10
Europe				
United Kingdom	50	2	25	202
Austria	75	4	28	163
Switzerland	75	5	24	289
Denmark	60	5-10	36	359
Finland	85	29	57	996
Sweden	90	11	46	430
Germany	60	2	17	141
Spain/Portugal	90	<2	18/31	62/45
Italy	50	1	36	56
Central Europe	35	<1		
Greece	40	<1	19	38
Asia				
Hong Kong	25	<2	47	108
Singapore	95	5	35	187
Korea	90	3	30	38
Malaysia	10	<1	10	18
India	10	<1	1	0
Philippines	15	<1	2	1
Taiwan	10	0	22	48
Indonesia	0	0	1	0
Thailand	0	0	3	4
Australia	90	4	29	400

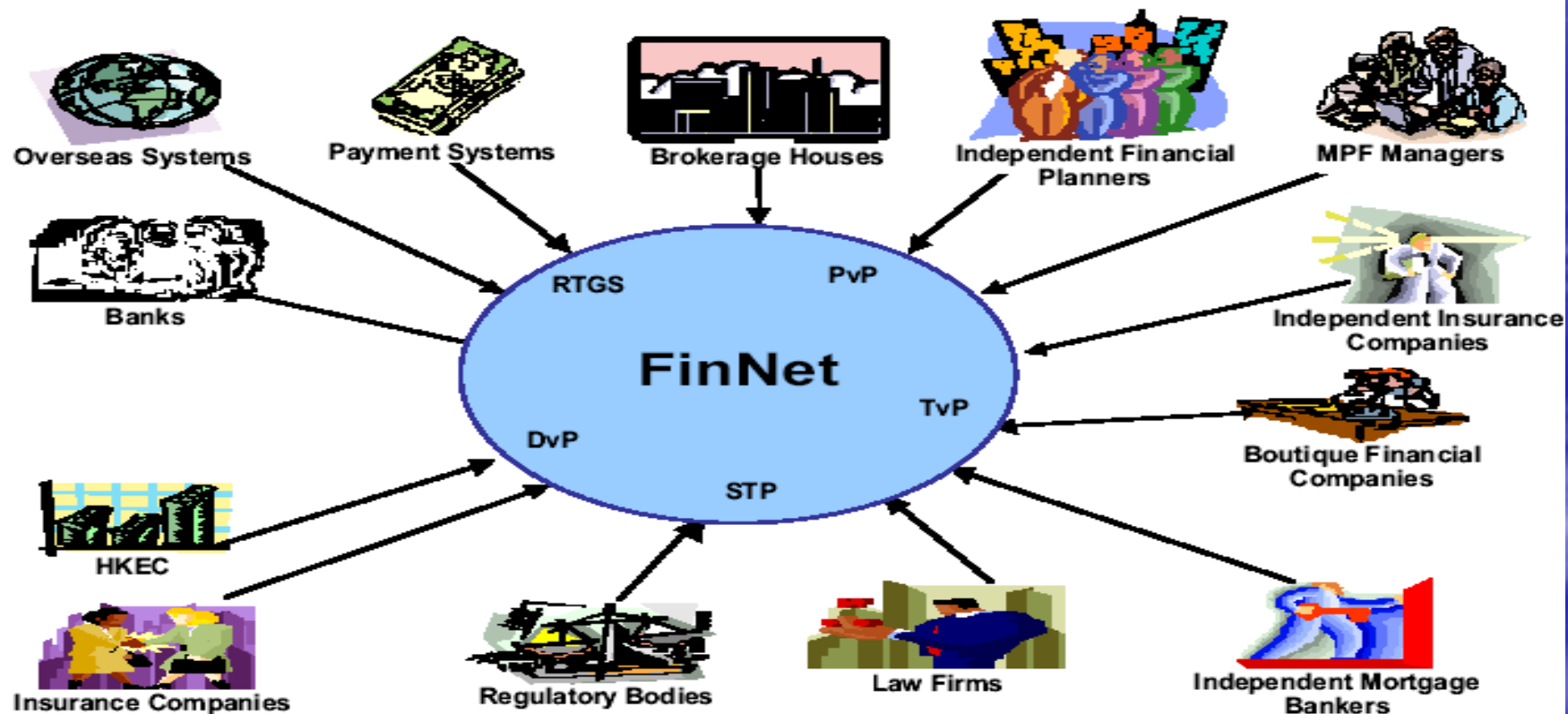
Sources: Credit Suisse First Boston (for Online Banking) and World Development Indicators 2000, The World Bank (for the number of cell phones and active IP addresses).

## FinNet: Toward a paperless infrastructure backbone for financial services

Hong Kong (China), along with some other economies, has been modernizing its financial network infrastructure to enhance its status as a financial center and become one of Asia's most convenient centers for business to business commerce.

Governed by a public-private partnership, a financial network, FinNet, will be established (see Figure). FinNet will be a secure, open, scalable, and high-performance community network interconnecting all types of financial services and all financial markets and institutions in Hong Kong (China). This includes all

securities, derivatives, banking, and insurance activities; all licensed financial entities and key government agencies (such as regulatory agencies); law firms; independent mortgage brokers and insurance companies; independent financial planners; and even overseas systems if they meet certain standards. FinNet will allow straight-through processing of all functions related to financial transactions, from the front end to the back end. In addition, it will permit real-time delivery versus payment and payment versus payment.



DvP = delivery versus payment; RTGS = real time gross settlement system; PvP = payment versus payment; TvP = trade versus payment; STP = straight through processing; MPF = mutual portfolio funds; HKEC = Hong Kong exchanges

Source: Hong Kong Monetary Authority.

Table A2-1

## Current e-finance initiatives by international bodies

International body	Protection of privacy and personal data	Secure infrastructure: authentication and certification	Consumer protection	Commercial law	Taxation	Electronic payment and movement of goods
BIS						•
IEC		•				
ILO	•					
ISO		•				
ITC						
ITU	•	•	•	•		•
UN/CEFACT		•		•		
UNCTAD				•		•
UNESCO	•	•	•	•		
UNICITRAL		•	•	•		•
UPU	•	•	•			•
World Bank		•		•	•	•
WCO		•				•
WIPO				•		
WTO	•					•
International body	Trade facilitation and market access	Intellectual property	Internet governance	Standards	Economic and social impacts	Small and medium-size enterprises
BIS						•
IEC		•				
ILO	•					
ISO		•				
ITC						
ITU	•	•	•	•		•
UN/CEFACT		•		•		
UNCTAD				•		•
UNESCO	•	•	•	•		
UNICITRAL		•	•	•		•
UPU	•	•	•			•
World Bank		•		•	•	•
WCO		•				•
WIPO				•		
WTO	•					•

Source: OECD Emerging Market Economy Forum on Electronic Commerce, Dubai U.A.E., 16 January 2001.

# Infrastructure Requirements for E-Commerce

Six layers of infrastructure needed for e-commerce:

- 1. Underlying telecom network infrastructure
- 2. Internet infrastructure
- 3. E-commerce applications
- 4. E-commerce intermediaries
- 5. Sellers and buyers need to be equipped to make transactions
- 6. Legal and regulatory infrastructure

# Some Categories of E-Commerce

- Business-to-business (B2B)
  - Cisco Systems (network equipment)
  - Oracle (software)
- Business-to-consumer (B2C)
  - Amazon.com (books)
- Consumer-to-business (C2B)
- Consumer-to-consumer (C2C)
  - eBay (auctions)

# Categories of E-Commerce (2)

- Tangible products
  - computers, books, CDs, groceries
- Intangible (digital) products
  - software, newsletters, music downloads
- Services
  - brokerage transactions, air tickets, hotel bookings



# Categories of E-Commerce (3)

- Internet-based e-commerce firms (“dot.coms”)
  - Amazon.com
- Traditional firms offering e-commerce (“etailers”)
- Sector-specific B2B market exchanges
  - GlobalNetXchange, e-steel

# Opportunities for E-Commerce in Developing Countries

- Public sector procurement
- Online markets in specific industry sectors
- Telecommunications, data processing and software development
- Travel and tourism
- Education and training

# Developing Countries Face Familiar Infrastructure Issues

- Availability
- Cost
- Performance
- Reliability
- Security
- Choices among carriers

# Telecom Competition and Pricing Policies

## Affect Internet Costs and Usage

- ITU, WB and OECD studies clearly show:
  - Carrier competition reduces leased line costs and speeds infrastructure build-out
  - ISP competition lowers Internet access costs
  - Internet usage greater with flat rates for access

# But Developing Countries Have Many Concerns About Internet Growth

- Shift of voice and fax traffic to Internet
- No international settlement payments for IP traffic
- Added Costs and Dependence on backbone carriers
- Loss of PTT revenue and jobs
- Loss of national control over communications and content

# Other E-Commerce Infrastructure Issues

- Lack of Internet e-commerce networks & hosts in developing countries
- Availability of e-commerce software and services
- Integration with legacy computer systems
- Electrical power reliability and backup
- Skills for maintenance and repair

# Government Policy Issues

- Commercial legal and regulatory framework
- Business licensing
- Tariffs, Taxes and duties
- Intellectual property rights
- Privacy
- Consumer protection
- Encryption and related national security issues
- Regulation of Internet content and usage
- Competition policies for telecom carriers, ISPs and e-commerce participants

# eBanking in Lebanon: Legal & Regulatory Framework

- BDL took the initiative in eBanking
- Law 133
- Draft e-Signature Law
- Circulars: eBanking; clearing & settlement; payment cards
- Compliance with international standards: BIS core principles for payment systems and Security Settlement Systems



# قانون رقم 133

@ أضيف بموجب هذا القانون الى مهام مصرف لبنان ما يلي:  
تطوير وتنظيم:

\* وسائل وانظمة الدفع وبصورة خاصة العمليات المجراة عن طريق الصراف الآلي  
وبطاقات الايفاء او الدفع او الائتمان .

\* عمليات التحويل النقدية بما فيها التحويل الالكترونية .

\* عمليات المقاصة والتسوية العائدة لمختلف وسائل الدفع والادوات المالية بما فيها  
الأسهم والسندات التجارية ولغيرها من السندات القابلة للتداول .

# قرار مصرف لبنان رقم 8341

- @ نظام المقاصة الالكتروني العائد لبطاقات الإيفاء أو الدفع أو الإئتمان المصدرة في السوق اللبنانية والمستعملة محلياً على أجهزة الصراف الآلي ATM
- \* غاية نظام المقاصة الالكتروني المنشأ في المركز الرئيسي لمصرف لبنان هو ان تتم من خلاله المقاصة الصافية بين شركات شبكات الربط الالكترونية للصراف الآلي المرخص لها من قبل مصرف لبنان (ATM SWITCHES) وتسوية حسابات المشتركين معها من المصارف أو المؤسسات المالية أو أية مؤسسة أو شركة لبنانية أو أجنبية مرخص لها بإصدار بطاقات إيفاء أو دفع أو إئتمان أو بتثبيت وتشغيل جهاز صراف آلي وفق أحكام القوانين والأنظمة المرعية الإجراء، الناتجة او المرتبطة باستعمال البطاقات المصدرة في السوق اللبنانية والمستعملة محلياً على أجهزة الصراف الآلي (ATM).

# قرار مصرف لبنان رقم 8341

- \*ان المقاصة هي إلزامية لكل من شركات شبكات الربط الالكترونية للصرّاف الآلي (ATM SWITCHES) والمشاركين.
- \*يقتضي على شركات شبكات الربط الالكترونية للصرّاف الآلي (ATM SWITCHES) إرسال نموذج رسالة المدفوعات الالكترونية الى مصرف لبنان بغية اجراء المقاصة والتسوية لديه.
- \*يستقبل مصرف لبنان رسائل المدفوعات الالكترونية بالعملة اللبنانية والدولار الاميركي واليورو في أيام العمل قبل الساعة الحادية عشرة صباحاً.

# قرار مصرف لبنان رقم 8341

- تتم في الساعة الحادية عشر صباحاً:
- 1 - تسوية أرصدة المشتركين مع شركات شبكات الربط الالكترونية للصرّاف الآلي (ATM SWITCHES) الناتجة عن المقاصة الصافية (Netting) المجراة لدى هذه الشركات.
- 2 - المقاصة بين شركات شبكات الربط الالكترونية للصرّاف الآلي (ATM SWITCHES) عملاً بمبدأ المقاصة الصافية (Netting).

# قرار مصرف لبنان رقم 7299

@متعلق بالصراف الآلي وببطاقات الائتمان والوفاء

- \* يُسمح للمصارف وللمؤسسات المملوكة من المصارف بوضع وتثبيت وتشغيل جهاز صراف آلي في المكان الذي تراه مناسباً وذلك شرط :
  - اعلام مصرف لبنان مسبقاً .
  - ان لا يتجاوز عدد اجهزة الصراف الآلي التي ينوي المصرف وضعها خارج مباني مراكز عمله عدد فروعها بالإضافة الى مركزه الرئيسي.

# قرار مصرف لبنان رقم 7299

\* يسمح لاية مؤسسة لبنانية اخرى بوضع وتثبيت وتشغيل جهاز صرّاف آلي في المكان الذي تراه مناسباً شرط :

- موافقة مصرف لبنان المسبقة .

- إبرام عقد بين المؤسسة والمصرف المعني يحدد ويحصر المسؤوليات المختلفة وعدد اجهزة الصرّاف الآلي المنوي تركيبها وتشغيلها والمنتازل عنها من قبل المصرف بعد تنزيل عددها من العدد الاجمالي الذي يحق له تركيبه وتشغيله خارج مراكز عمله.

\* يجب على اجهزة الصرّاف الآلي كافة ان تقبل بطاقات الائتمان والوفاء المحلية والدولية كافة المقبولة من مصرف لبنان

# قرار مصرف لبنان رقم 7299

\* يتوجب ربط اجهزة الصراف الآلي بشبكات الربط الالكترونية على ان ترتبط هذه الشبكات بعضها ببعض إلزامياً وعلى ان لا يجري التعامل محلياً الا بواسطة هذه الشبكات

# قرار مصرف لبنان رقم 7548

## @متعلق بالعمليات المالية والمصرفية بالوسائل الالكترونية

\* تعتبر "عمليات مالية ومصرفية بالوسائل الالكترونية" العمليات او النشاطات كافة التي يتم عقدها او تنفيذها او الترويج لها بواسطة الوسائل الالكترونية او الضوئية (هاتف - حاسوب - انترنيت - صراف آلي...) من قبل المصارف او المؤسسات المالية او مؤسسات الوساطة المالية او هيئات الاستثمار الجماعي او اي هيئة او مؤسسة اخرى ، ويشمل هذا التعريف ايضا العمليات التي يجريها مصدرو او مروجو بطاقات الايفاء او الدفع او الائتمان الالكترونية على انواعها كافة والمؤسسات التي تتعاطى التحاويل النقدية الكترونيا ومواقع العرض والشراء والبيع وتأدية سائر الخدمات الالكترونية للادوات المالية على مختلف انواعها ومراكز التسوية والمقاصة العائدة لها .



# قرار مصرف لبنان رقم 7548

\*على كل من يتعاطى "العمليات المالية والمصرفية بالوسائل الالكترونية" ان يتقيد بصورة مطلقة بمبادئ الاستقامة والنزاهة والشفافية

\*ان ممارسة "العمليات المالية والمصرفية بالوسائل الالكترونية" توجب :

-على المصارف وسائر المؤسسات المسجلة لدى مصرف لبنان او الخاضعة لرقابته، باستثناء مؤسسات الصرافة، اعلام هذا الاخير مسبقا برغبتها بالقيام بالنشاط المرخص لها به، كلياً او جزئياً، باي من الوسائل الالكترونية .

-حصول اية مؤسسة لبنانية اخرى بما فيها مؤسسات الصرافة، على ترخيص مسبق من مصرف لبنان بتعاطي اي نشاط محدد اعلاه.

-حصول اية مؤسسة اجنبية او فرع لمؤسسة اجنبية على ترخيص مسبق من مصرف لبنان بتعاطي اي نشاط محدد اعلاه اذا كانت تتوجه بعملياتها او تعرض خدماتها على الجمهور في لبنان .

# قرار مصرف لبنان رقم 7548

\* على المؤسسات المنشأة في لبنان التي تتعاطى عمليات التحاويل النقدية الكترونياً التقيد بالشروط المحددة في هذا القرار ،على سبيل المثال:

- ان تحافظ على السرية المهنية .
- ان تعقد تأمين على العمليات التي تجريها .
- ان تثبت ان لديها نظام حماية الكتروني فعال للعمليات التي تجريها

\* على كل من ينشئ مراكز للتداول الالكتروني بالاسهم وبسائر الادوات المالية او من يؤمن دفع العائدات والارباح العائدة لها ان يتقيد بما هو محدد في النصوص التنظيمية الصادرة عن مصرف لبنان المتعلقة بمؤسسات الوساطة المالية ولا سيما لجهة تخصيص رأسمال ادنى لعملياتها



SOBIL

# Secure Banking & Information for Lebanon

# LEBANON

Beirut

## Foundation: challenges facing the Lebanese financial sector

re-establishment of prominence in  
global financial markets

keeping pace with rapid change  
and modernization

- platform for secure payments  
(banks, markets, governments &  
cross border)
- increased ability to manage  
market liquidity & risks
- increased discipline in financial  
market practices

- electronic end-to-end processing  
at all levels of interaction
- assured reliability & integrity of  
strategic information
- appropriate regulatory  
environment

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# Context Map

## Outside Trends

- Basel II
- CLS (FX PVP)
- T+1 settlement
  
- virtual banks
- EU trade agreement
- development in UAE financial markets

## Technology Factors

- use of standards to ensure integration compatibility
- end-to-end

## Political Climate

- draft law for e-signature
- law re information privacy
- laws re electronic documents

## Customer Needs

- more consolidated reports with greater detail
- clarity of data elements
- centralisation of
- dollarisation

## Inside Trends

- manual process
- hard copy usage
- computerization of operations
- duplication of reports & data
- data ownership policy & data sharing

## Uncertainties

- connection with existing credit card



# Project O

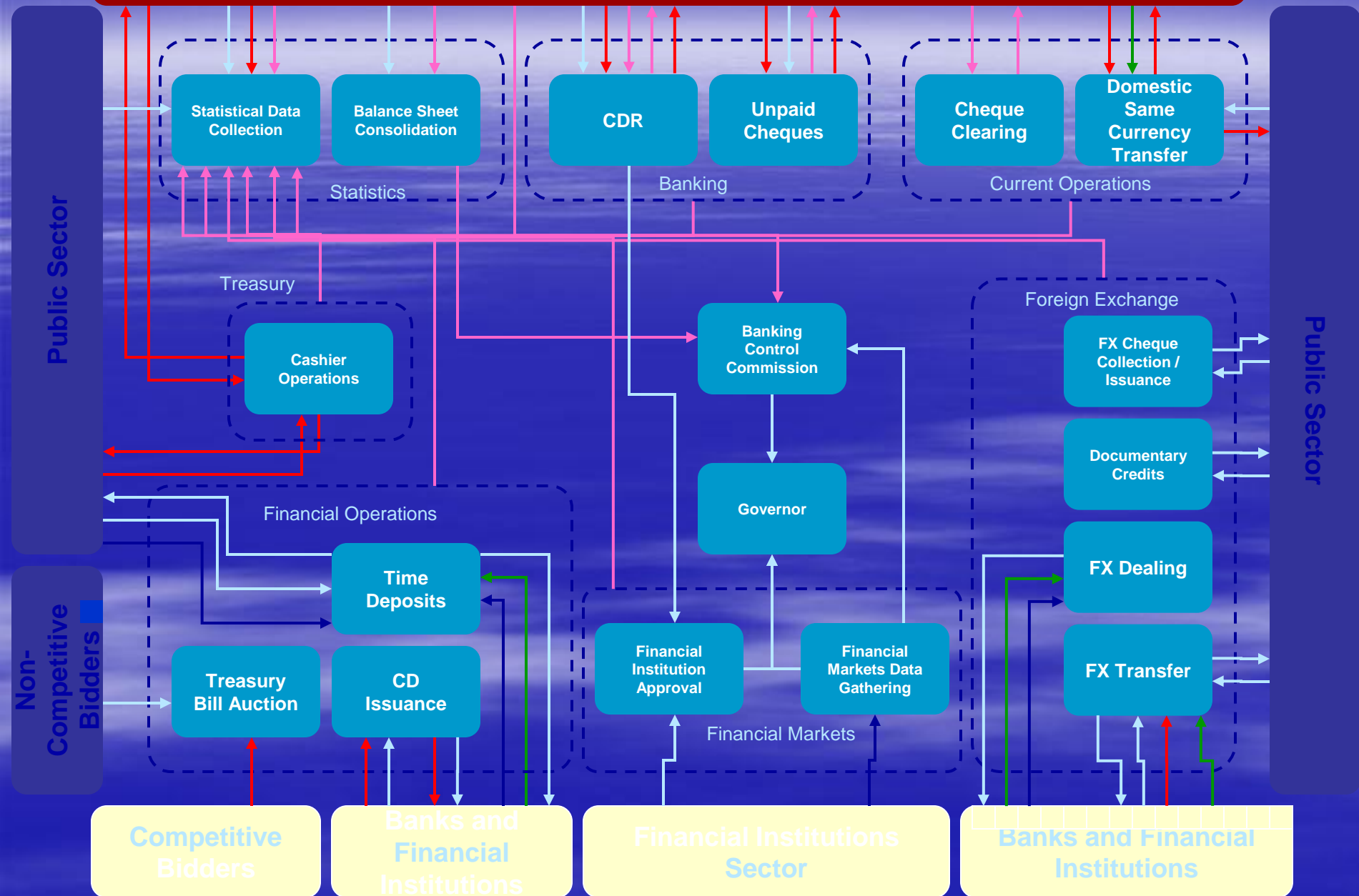
## Interbank Processes:

- transaction processing efficiency
- report collection efficiency
- effective information extraction from data

## Infrastructure:

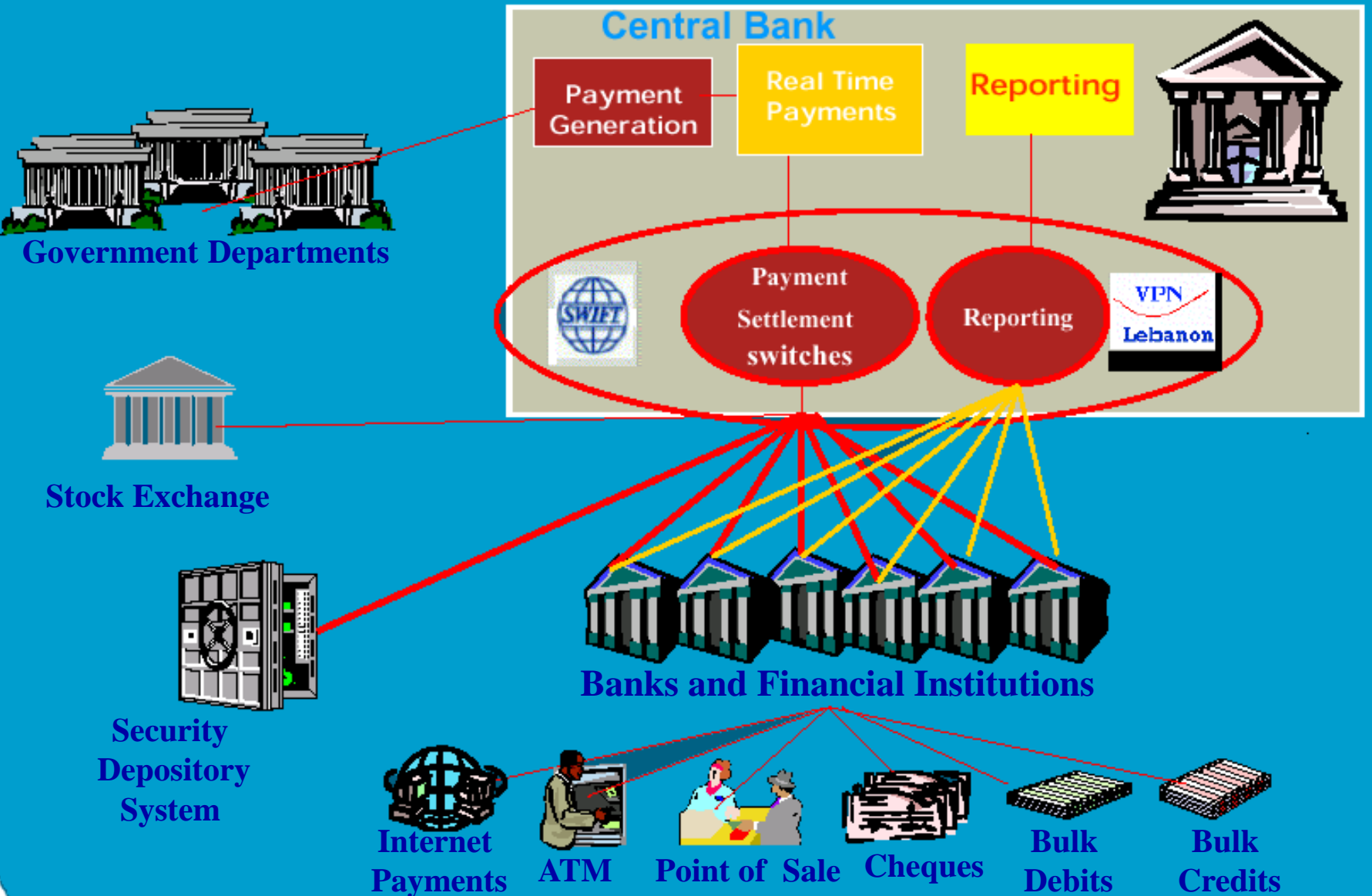
- reliable communications network
- strong, pervasive security
- high availability

# Banks and Financial Institutions





# Transaction and Reporting System

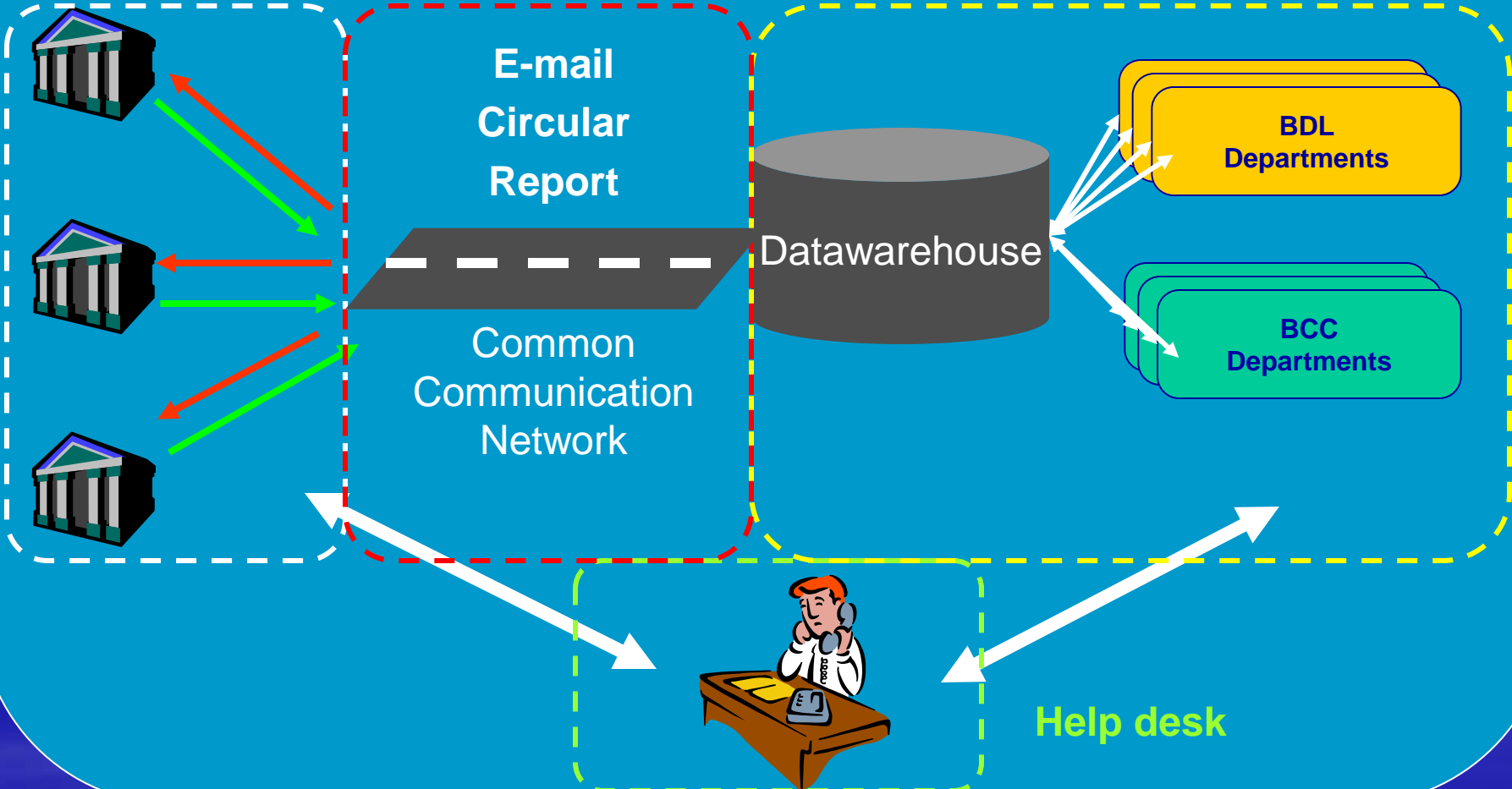


# Reporting & Communications Solution

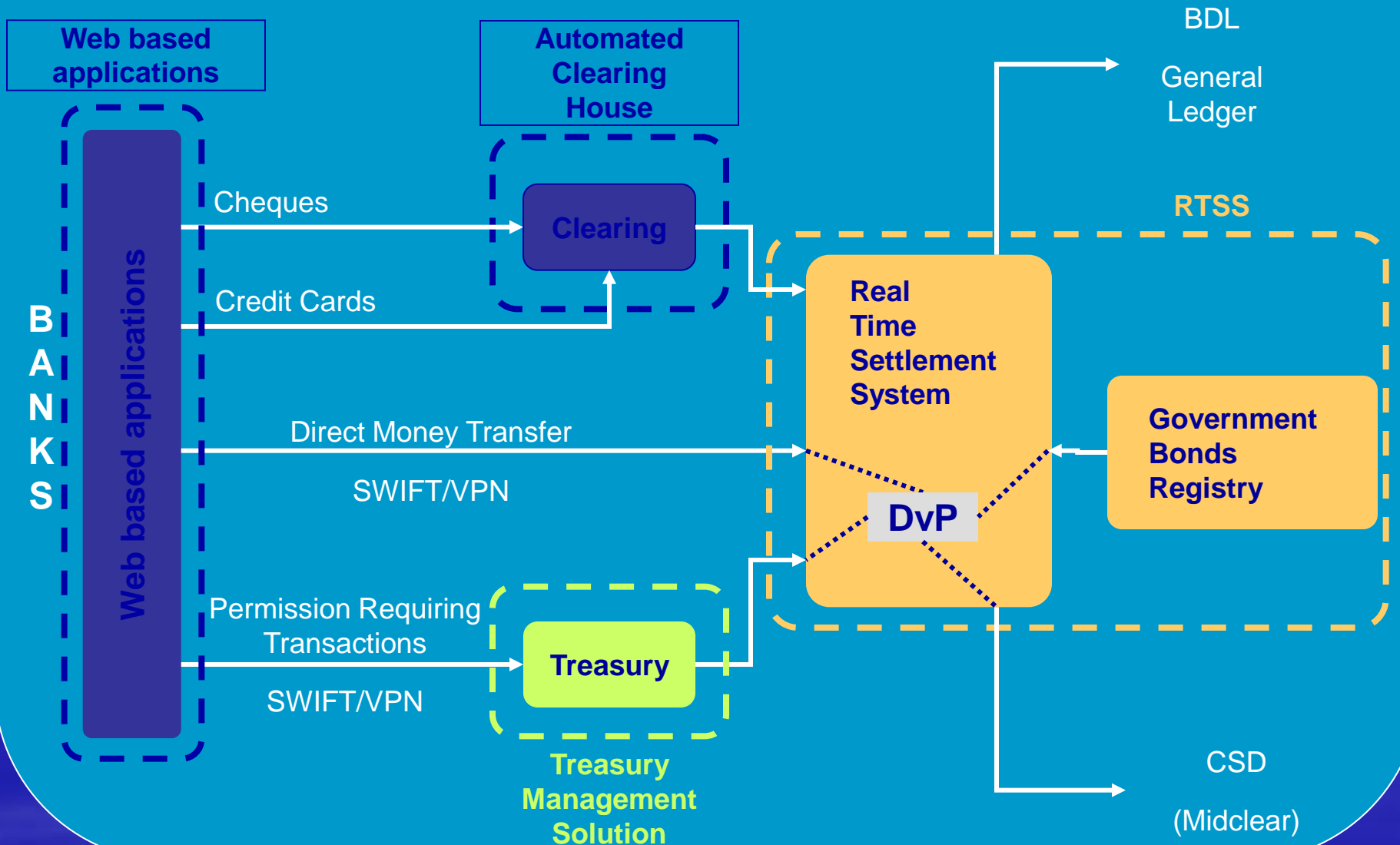
Web-based application processing

Common communications network

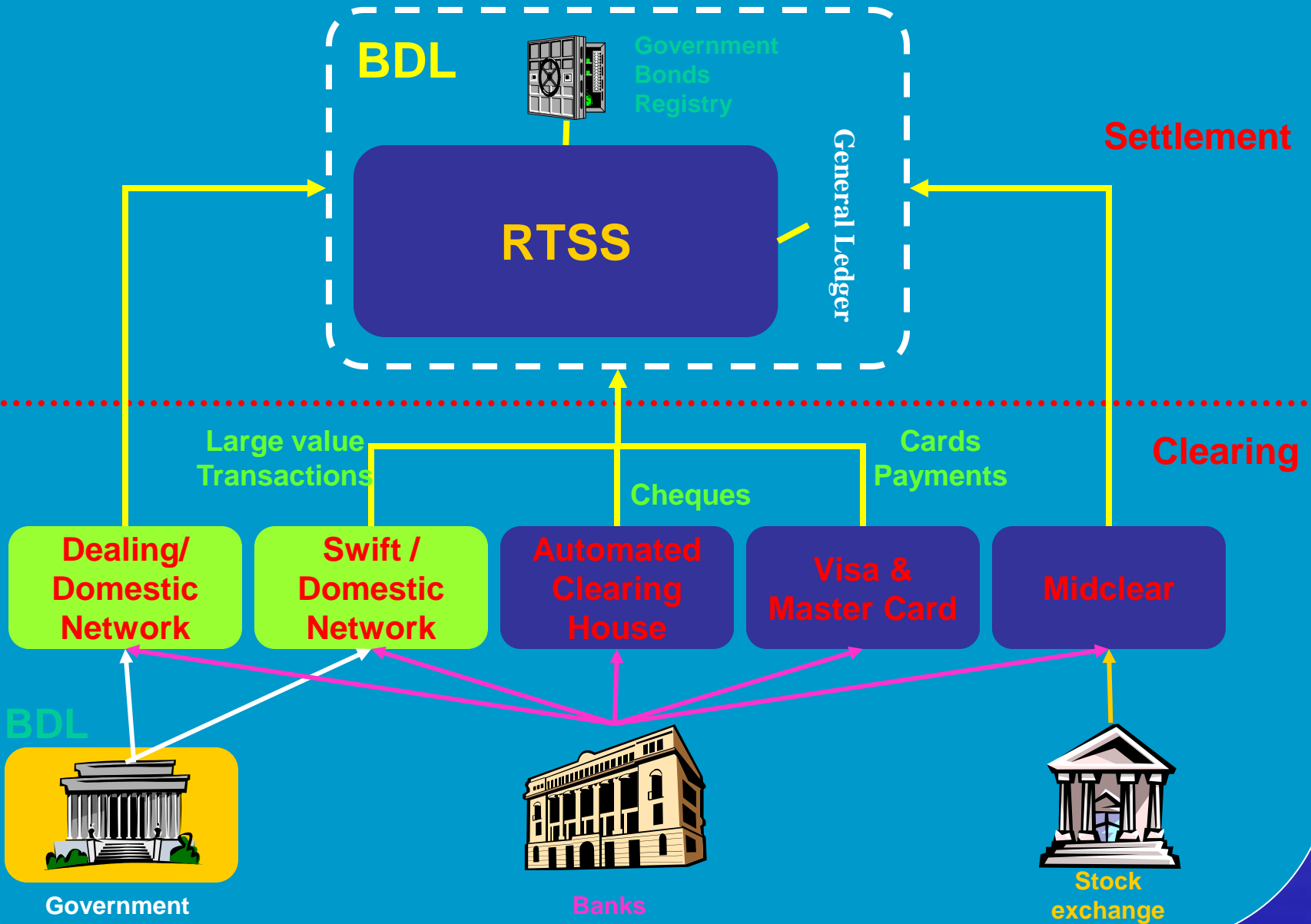
Electronic reporting



# Transaction Solution Overview



# Real-Time Settlement Systems Process Flow



# Common Uses of Public-Key Cryptography

- Secure E-mail and other communications
  - Secure electronic communications between individuals
- Secure WWW transactions
  - Consumer-merchant purchases
  - On-line banking
- Business-to-business transactions
  - Electronic Data Interchange
  - Electronic Trading
- Other e-commerce solutions

# Requirements for Banking & Commercial Applications

- Confidentiality
- Integrity
- Authenticity
- Non-repudiation

# Traditional paper-based solutions

- Confidentiality
- Integrity
- Authenticity
- Non-repudiation
- Availability
- Envelopes
- Signatures, Watermarks, Barcodes
- Notaries, strong ID, physical presence
- Signatures, receipts, confirmations
- Alternate routes, sites, etc.

# Electronic Threats

- Confidentiality
  - Eavesdropping
- Integrity
  - Modification of data, viruses
- Authenticity
  - “Spoofing”
- Availability



# Electronic Solutions

- Confidentiality
  - Authenticity
  - Integrity
  - Non-Repudiation
  - Availability
- Data Encryption
  - Digital Signatures, Certificates, Digital Ids
  - Hash Algorithms, Message Digests, Digital Signatures
  - Digital Signatures, Audit Logs
  - Redundant Systems, Automatic Failover

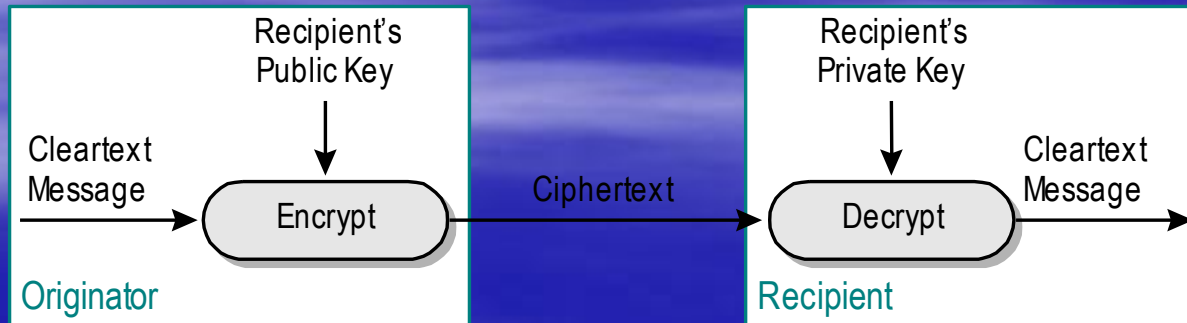
# Adding Confidentiality

- Symmetric Cryptography
  - Single key, shared secret
- Problems:
  - key exchange in large environments
  - lifetime vs. length of key
  - “brute force attacks”



# Adding Confidentiality

- Asymmetric (public-key) cryptography
  - Two keys used: public key and private key
  - Either can be used for encryption/decryption
- Problems:
  - Computationally intensive
  - Privacy and availability

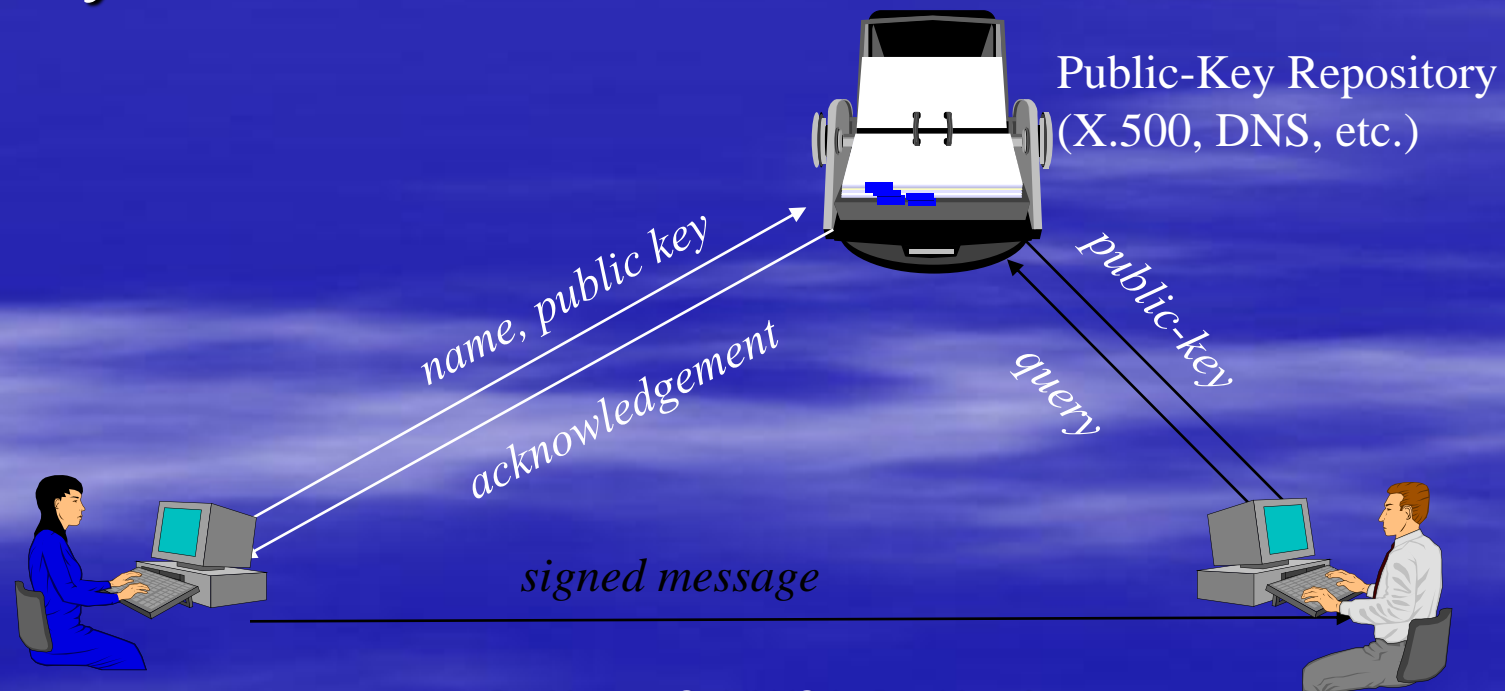


# Requirements of Public-Key systems

- **SECRECY** of the private key
  - Must be known only to owner
  - Key ownership = Identity
- **AVAILABILITY** of the public key
  - Must be available to anyone
  - Requires a public directory

# Retrieving Public Keys

- Public keys stored in repositories
- Keys can be retrieved on demand

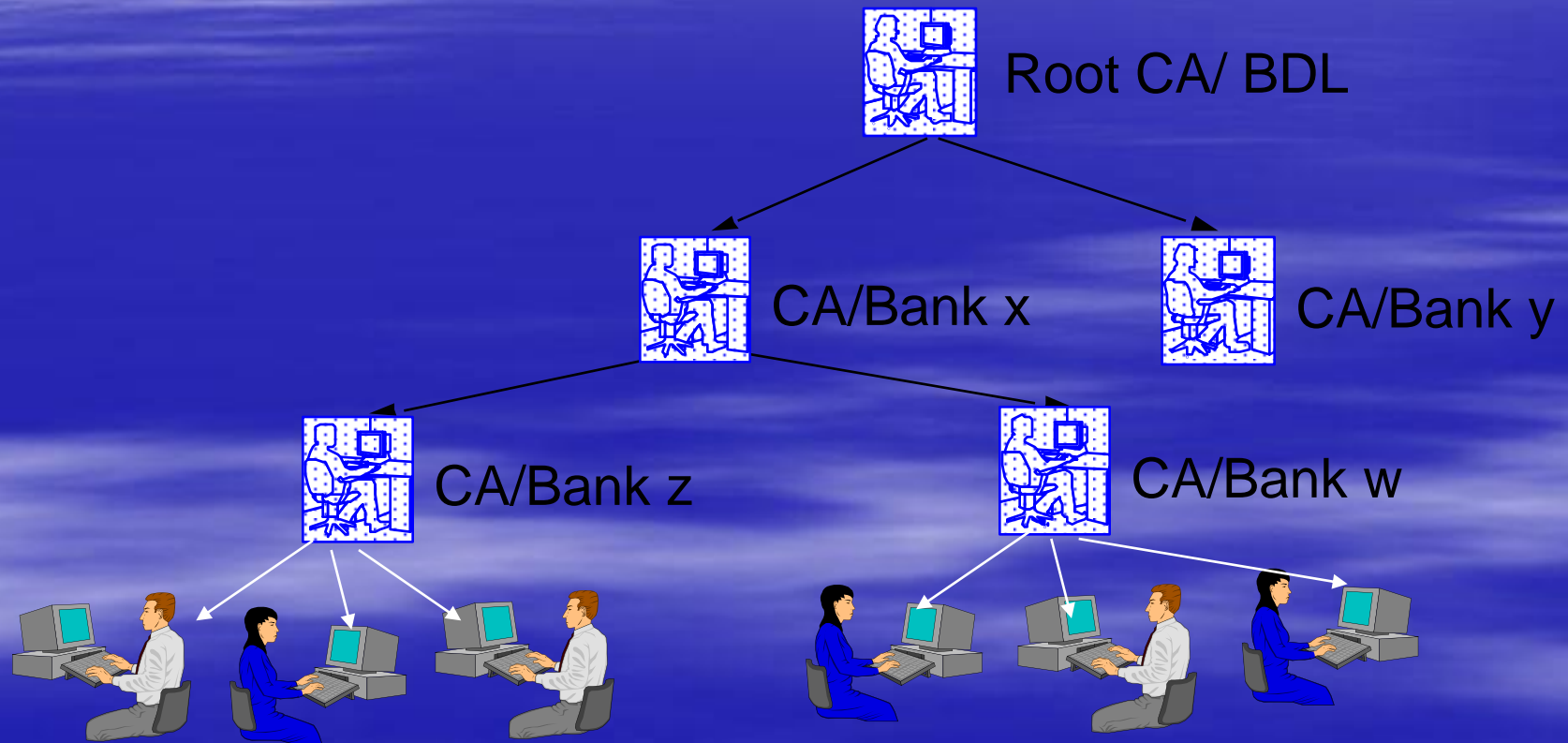


# Certification Authorities (CAs)

- Users send keys to a Certification Authority. CA then generates a certificate for the user, signed with the CA's private key.



# CA Hierarchy



# Changes in Public Policies

- Enabling environment
  - Communications Infrastructure
  - Electronic Security Arrangements
  - Information Infrastructure
  - Legal framework and enforcement Risk related regulations
- Competition policy
- Managing risks
  - Institutions/prudential
  - Consumer/investor protection



# Some Conclusions

- We should aim to 'leapfrog' in developing our banking, payment and financial systems to support eBanking & eFinance, e-Services & e-Commerce
- SeBIL will be Lebanon's platform for a new regional eBanking and eFinance role: it will allow us to leapfrog
- We should aim to develop Arab regional payment networks and integrate national payment networks: essential for fostering trade and investment

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