„Cloud computing" expectation opportunities and obstacles

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Presentation structure

- Introduction
- Cloud computing
- Cloud models
- Cloud benefit and obstacles
- Legal issues
- Conclusion

Computer application - objective

- Efficiency,
- Adequacy - client needs
- Adequacy - purchase and usage expenses
- The aim was always the same, to satisfy user needs with lowest possible costs.

IT investment increases:

- Company specific
  - Seasonal fluctuation - top load
  - Business perspective and dynamic: application widening in new business and projects often changes not only HW needs but all other needs as well

- Technology specific:
  - fast IT and application "ageing"
  - HW prices decreases but other IT costs increases

Seasonal fluctuation

- day, week, month, year
- It is necessary to prepare complete IT infrastructure to handle *estimated* top load requirements
- Underestimated number of users and their requirements can be reason
  - for large problems in IT systems exploitation
  - even jeopardize company relationship with business partners
  - company existence

Building little "bigger" IT system

- reserve in capacity system & performance
- better strategy then attempt to find fast salvation solution in situation of blockade or significant performance downsizing.
- possible solutions
  - are not immediately available,
  - significantly more expensive then reasonable surplus in resources and capacity in project requirement phase.

Consequences

- **over-dimensioned IT system is**
  - more complicated than smaller one
  - unnecessary lies beyond real necessities
  - **more expensive**

Fast IT technology development

- **Present technological solutions**
  - **technological peak before 3-5 years,**
  - **it will become absolute or even unusable in several next years.**
- programs replacement can look rather simple,
  - large number of computers and connected workplaces require large organizational effort and not from IT staff only.
- lack of licenses
  - consequence of new computers acquisition
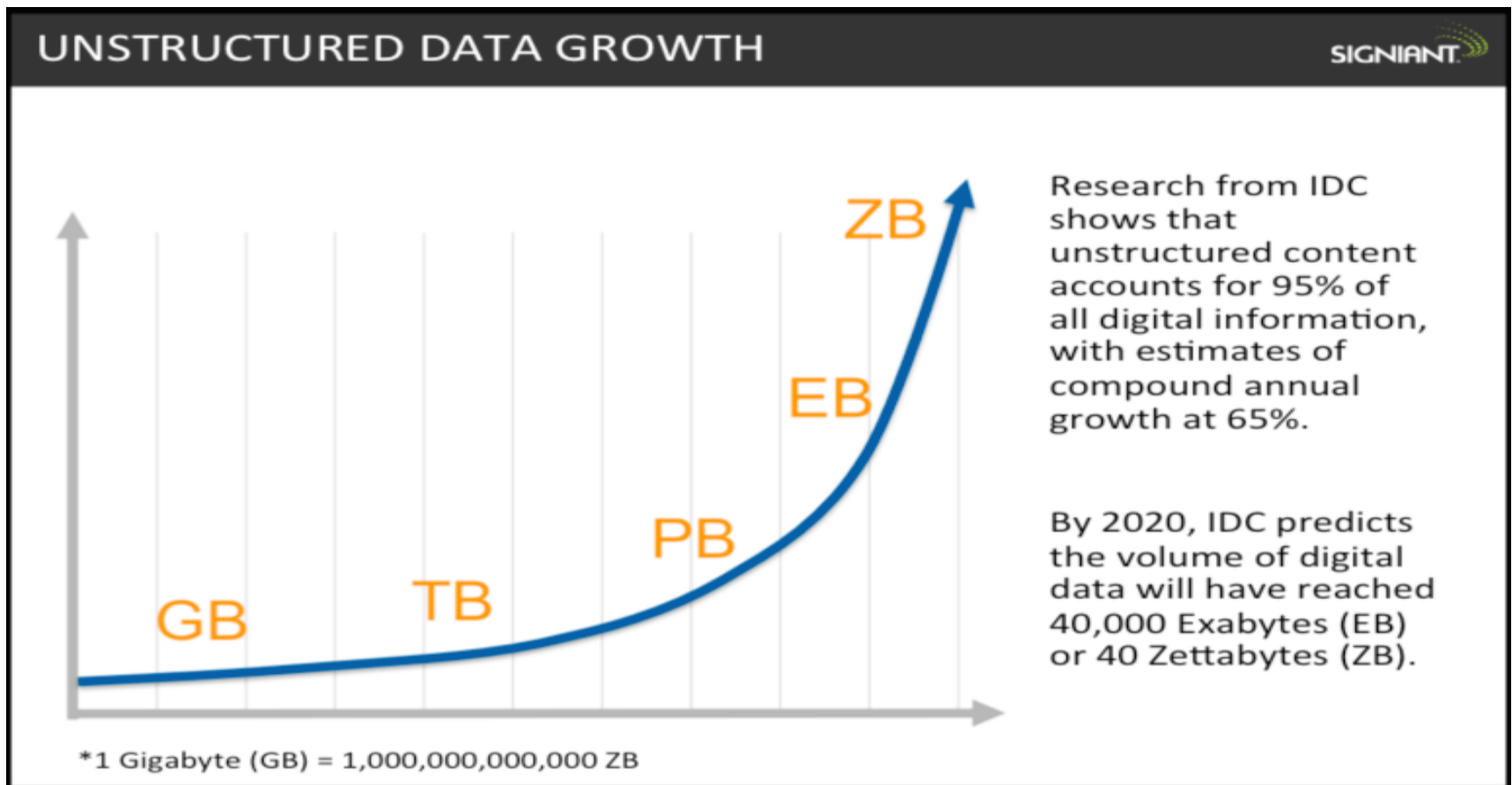 - increase total cost of investment.

IT average capacity usage - low

- Existing technological solution forces companies to buy more hardware and software equipment then they really needs.
- Average usage
  - personal computer - only 5%,
  - server capacity is 35-40%.
- Software - requires growing resources
  - Processors
  - Memory

Data growth

doubles every 3-5 years

UNSTRUCTURED DATA GROWTH

SIGNIANT

ZB

EB

PB

TB

GB

Research from IDC shows that unstructured content accounts for 95% of all digital information, with estimates of compound annual growth at 65%.

By 2020, IDC predicts the volume of digital data will have reached 40,000 Exabytes (EB) or 40 Zettabytes (ZB).

*1 Gigabyte (GB) = 1,000,000,000,000 ZB

IT infrastructure maintaining

- Daily - users must update their programs with new versions or "patches", caring about data protection and backup procedures.

- companies are not qualified and equipped - nor from organizational nor from staff point of view.
  - IT plays just support role in their business
  - strategic goals lays somewhere else.

- all companies must have computer professionals on duty
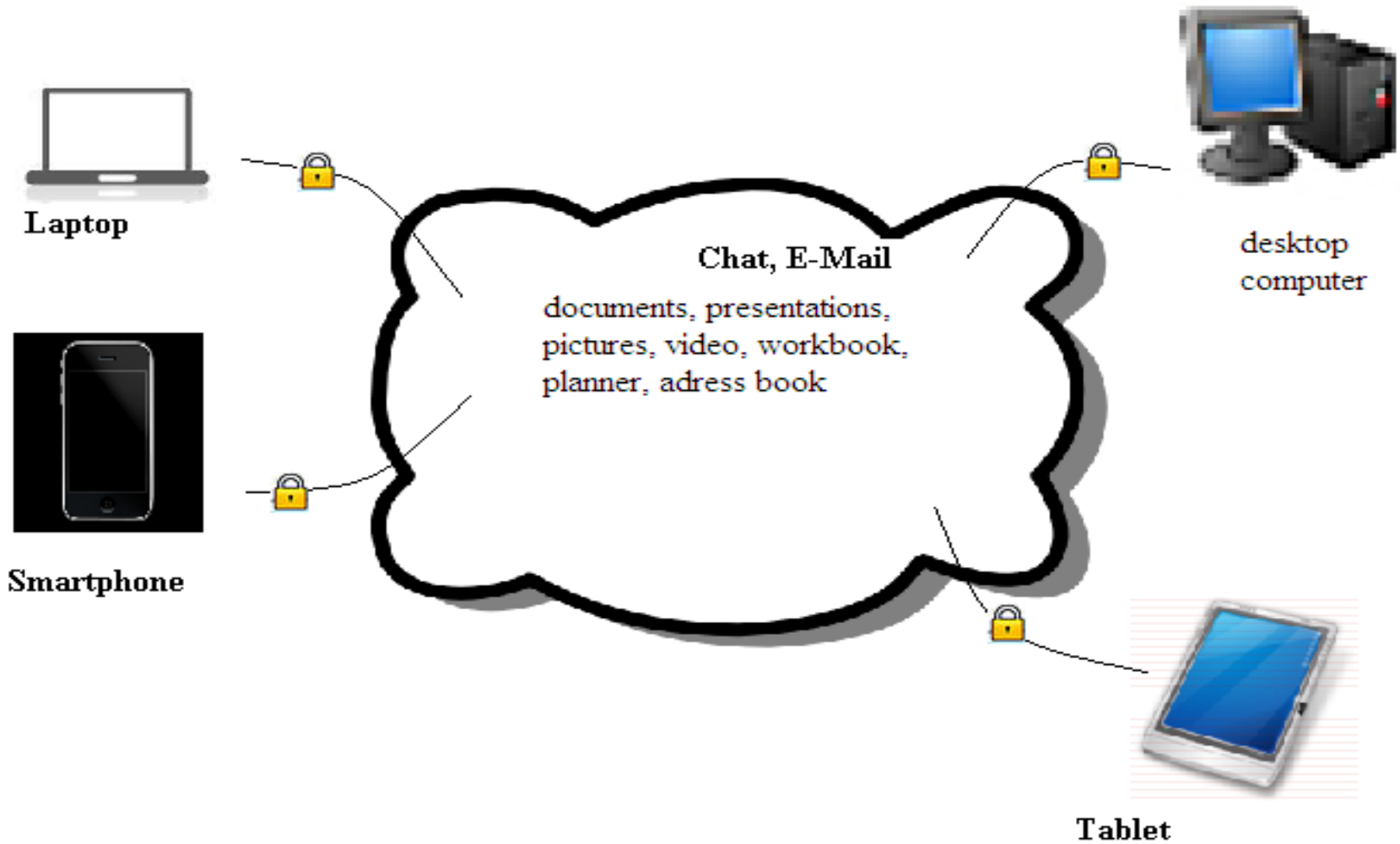
Consequences

- For the company
  - complicate company IT usage
  - fixed and variable expenses growth.

- Environment
  - market competition grows
  - costs decreasing pressure
  - IT expenses
    - becomes significant burden in business
    - attracts special attention

"Computer cloud" from the user perspective

- "model of computer resource usage in which the resources are rent but not buy (servers, hard disks, operation systems and applications)

- user pays only those computer resources when and how he/she really use (pay as you go)

- user need not to take care about decisions for acquiring new hardware and software installation and software maintenance on those hardware anymore."(Brumec 2011)

Cloud computing

Laptop

Smartphone

Chat, E-Mail

documents, presentations,
pictures, video, workbook,
planner, adress book

desktop
computer

Tablet

The user

- Rents all needed resources
- peak load – user rent necessary resources in the given period and in the given measure suitable to their needs.
- When these requirements disappear- additional resources are cancelled.
- additional resources are prepared and configured for use in advance.
- No need for additional computer software licence purchase and all connected expenses related to the configuration and computer tuning, because network resources are used e.g. "server or computer farms".
- additional service - paid according to the spending, eg. exactly as much as user had used it.

"Cloud computing" can be applied

- **IaaS**, **Infrastructure-as-a-service:**
  - Rented computer infrastructure are used as own.
  - User must take care about applications on those servers.
- **SaaS**, **Software-as-a-service:** this is the oldest "cloud computer" concept - first one accepted in practice.
  - Existing applications which are on Internet - offered to the private and business users (Hotmail, Gmail, Yahoo).
- **PaaS**, **Platform-as-a-service:** most "cloud computer" concept
  - PaaS is - offers complete platform – hardware and software – on which companies can run own business application as if it is on their own infrastructure.

Cloud benefits
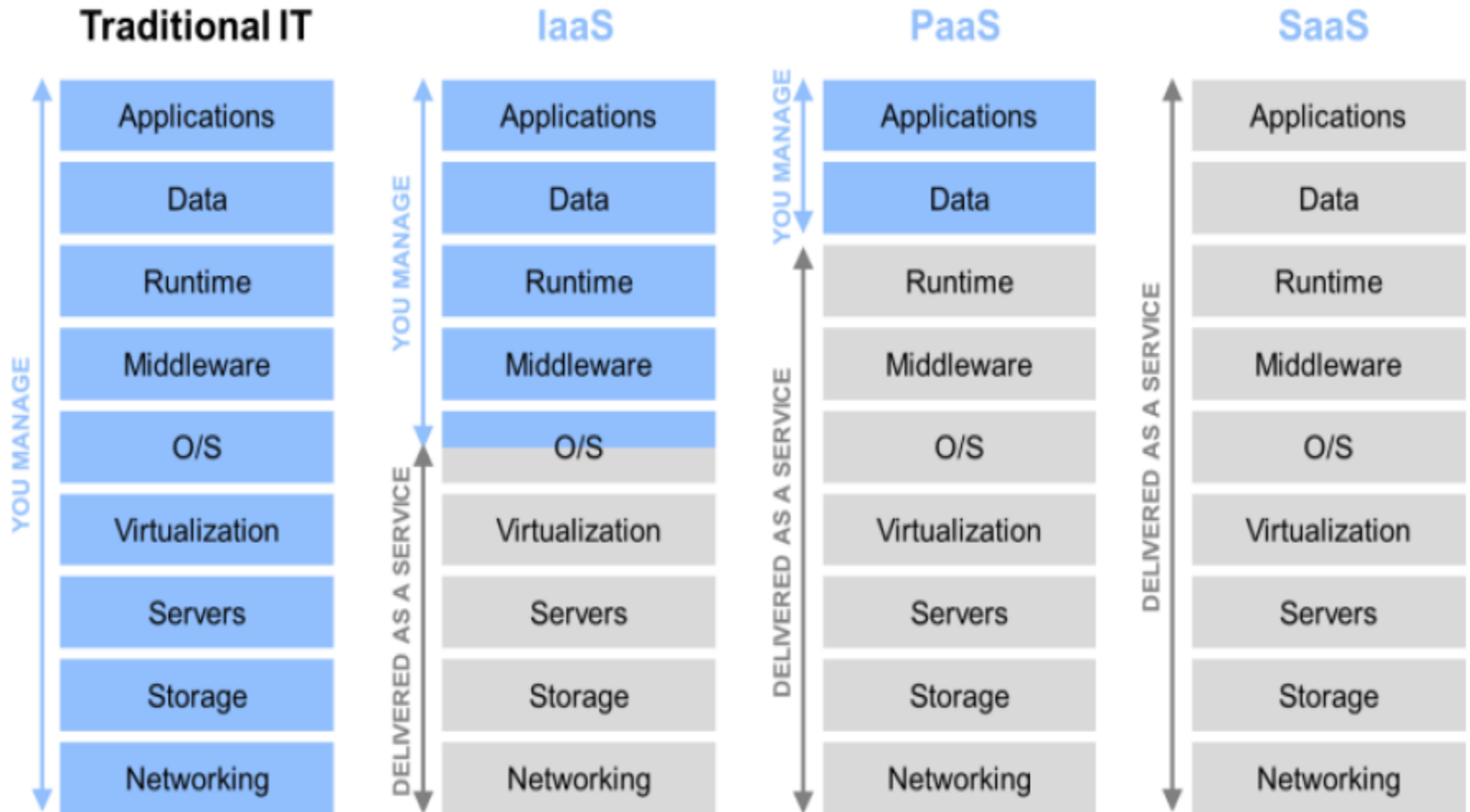
Private or internal cloud

- critical applications rises to the technological level which secure basic "cloud computing" appliance.
- company gains some benefits
  - resources virtualisation,
  - hardware resources sharing,
  - possibility of recovering,
  - adaptation to changing needs for resources,
- does not offer all advantages offered by real "computer cloud".
- company must secure all necessary resources as in classical computing (hardware, lifeware, network) and must independently or with expert help manage them as it was managed in classical computing model.
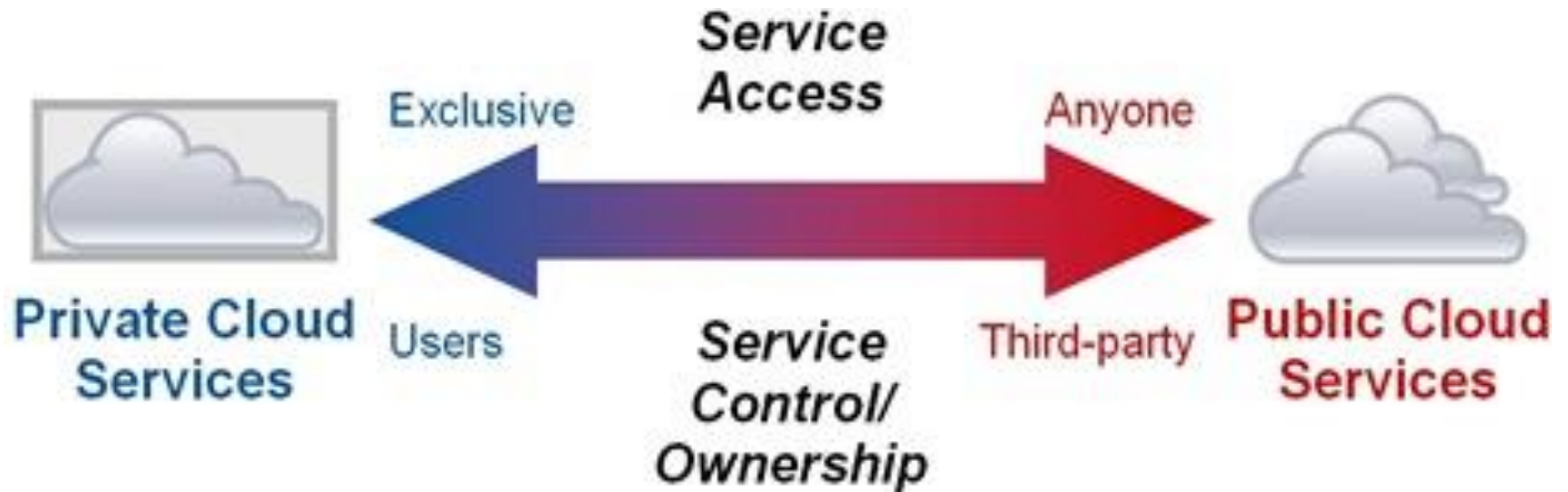- analysts don't accept as real "computer cloud".

Community cloud

- Several companies decide to use same service and share expenses on the way that each of them pay less for individual use of public cloud.

- Each user has lower expenses then to develop own private cloud, securing higher security and privacy level in comparison with public cloud.

Hybrid cloud

- **most frequently** in situations **when companies has its own computer centre** which should secure to users adequate resources and services and adequate privacy and secure of the service.
- business processing functions - on the same way as it was before, eg. by its own computer department.
- combination of public and private cloud
  - all the processes are performed on the private cloud,
  - majority of data protection and restore functions (backup and recovery) are secured by public cloud.
- Hybrid cloud will be dominating model of the cloud.
- It can be formed by two or more mutually connected clouds, which can be secured by inside or outside supplier.
- data security and privacy - good choice.

Private & public cloud

Service Access

Exclusive · Anyone

Private Cloud Services · Users · **Service Control/ Ownership** · Third-party · Public Cloud Services

- Ownership and control - complete or partial
- Access to the service can be
  - extremely exclusive,
  - granted to anyone.
- all sub variants are possible here as well

Advantages – user perspective

- Lower costs of software support:
  - users pays as much as they are spend (use)
- Always the latest and newest version of software support
- Software support and data are available from any location from which user can access to the Internet
- Lower maintenance and upgrading costs of software support
- There are no costs directly related to
  - hardware purchase, licences for operating systems on computer servers, databases, electronic mail servers,
  - installation, configuration and maintenance.
- Full professional antivirus protection is included, and in subscription model backup and archiving of data.

Disadvantages – user perspective

- Availability – service is not possible if the Internet connection is weak or missing
- Security problems
  - Confidence that service provider will not steal, sell or abuse:
    - Users data, documents and databases
    - behavioural data connected with users or application usage
  - possibility of "eavesdropping" of clients communication between clients and other client computers and computer centres
- problem of dependency on only one application service or service provider
  - lack of data storage and exchange standards between different platforms

Primary benefits of cloud services

- computing resources on-demand (which saves companies from having to plan ahead for securing such resources);

- elimination of upfront commitments to IT (and thus avoid purchasing new hardware, software or whole data centres for computing demand that may be uncertain in the future)

- pay-per-usage pricing (e.g., processors by the hour), which reduces the amount of computing resources that are sitting idle.
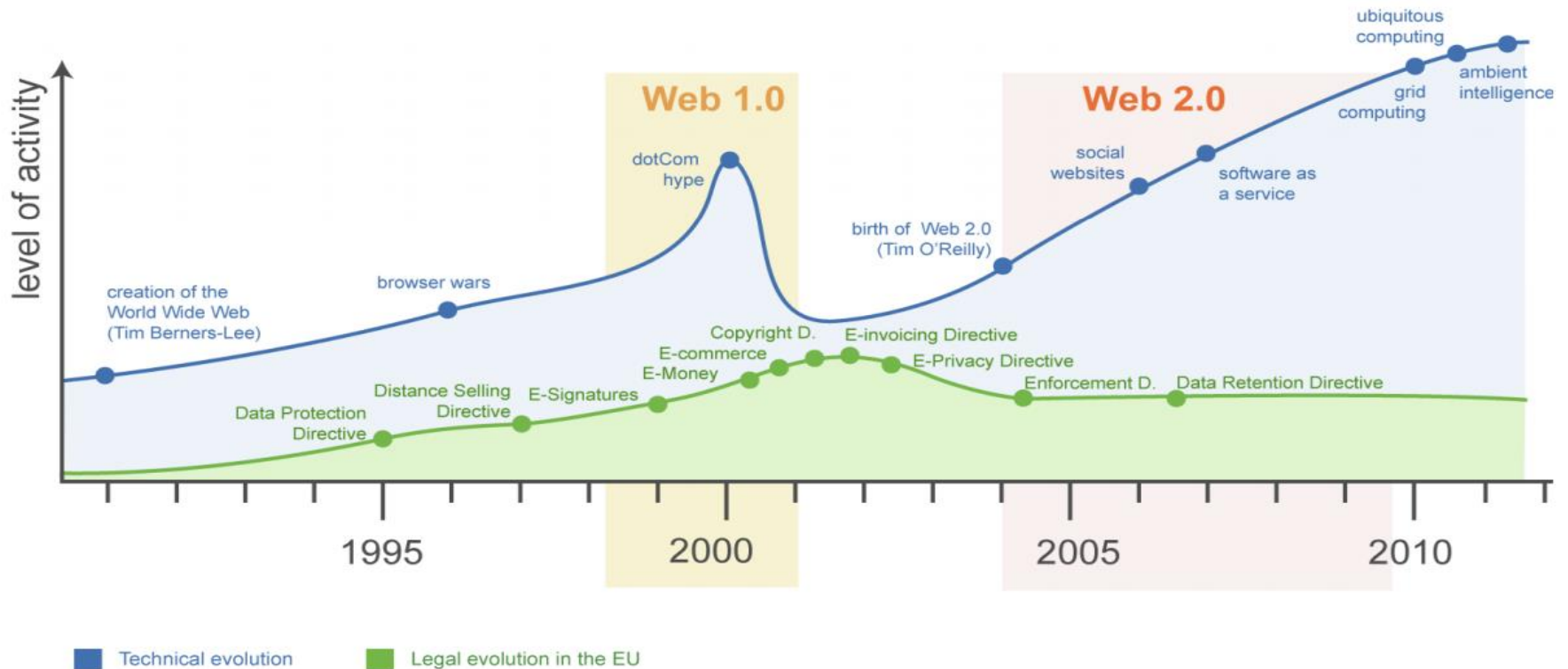
Other benefits

- Increases the liquidity of the company - pleases the chief financial officer
- costs can be controlled to be reduced in a short time
  - high initial investments are ongoing costs that are also flexible
- The adaptability of the company is growing because it can more quickly react to the unexpected.
- More jobs can be absorbed better, even less.
  - If the right cloud partner found and arranged everything legal, is also reduced the administrative burden.
- IT department can often shrink significantly.

Disadvantages

- How safe and reliable suppliers in the long term?
- If your own data to flow to other servers, companies lose ultimate control.
- Ultimately, the business is based on trust.
  - Uncertainty for German companies also provide the commitment of American suppliers to pass on data if necessary to the state, even when there are data centers on European soil. Here the lawyers arguing still about the exact interpretation.
- company is responsible - for compliance with all applicable data protection rules
- **cloud is in itself as a relatively safe**, experts makes the **data transfer between user and server very worried.**
- even smart phones are protected extremely well to prevent the transmission of information in the cloud external requests.

Technical vs Legal evolution EU

A timeline chart comparing technical evolution (blue) and legal evolution in the EU (green) with level of activity on the y-axis and years 1995–2010 on the x-axis.

Technical evolution (blue): creation of the World Wide Web (Tim Berners-Lee); browser wars; dotCom hype; Web 1.0; birth of Web 2.0 (Tim O'Reilly); Web 2.0; social websites; software as a service; grid computing; ubiquitous computing; ambient intelligence

Legal evolution in the EU (green): Data Protection Directive; Distance Selling Directive; E-Signatures; E-commerce; E-Money; Copyright D.; E-invoicing Directive; E-Privacy Directive; Enforcement D.; Data Retention Directive

Legend:
- Technical evolution
- Legal evolution in the EU

http://www.isaca.org/Groups/Professional-English/cloud-computing/GroupDocuments/DLA_Cloud%20computing%20legal%20issues.pdf

Privacy and data protection laws

- Adopted in pre-Internet area when centralized and limited processing was the rule

- EU rules are substantially more restrictive than rules from other countries (particularly US)

- Principle: no transfer of data to countries outside the EU that do not offer an "adequate level of protection"

Cloud computing services

- offer low barrier to entry and easy scaling possibilities "click-wrap agreements" (SW - agreement)

- Many publicly available cloud computing contracts limit liability of hosting provider to a level that is not in line with the potential risk

- Cloud computing contracts resemble typical software licenses, although potential risk is much higher

Contractual issues

- Vendor lock-in
  - There is no general legal requirement for a vendor to provide you with data export facilities.
  - Everything depends on your contractual agreement.
- Unilateral termination possibilities
  - Cloud provider often reserves the right to unilaterally terminate its service provision
  - Involvement of multiple parties
    - no single point of contact

Other issues

- Auditing requirements
  - many contracts impose auditing possibilities that include physical inspection
  - how can these auditing requirements be complied with when geographically decentralized cloud services are used?
  - Applicable law & competent court if outside own country, any litigation can become prohibitively expensive
  - What happens in case of bankruptcy of the provider?

Establishing a Trusted Cloud Europe
A policy vision

CloudforEurope

The Cloud Computing Strategy	Cloud strategy's key actions	DG CONNECT working groups for the implementation of the strategy

The European Commission's strategy 'Unleashing the potential of cloud computing in Europe'

Adopted on 27 September 2012, it is designed to speed up and increase the use of cloud computing across the economy

Cutting through the jungle of technical standards

Development of model 'safe and fair' contract terms and conditions

A European Cloud Partnership to drive innovation and growth from the public sector.

ETSI: Cloud Standards Coordination — *Launched on 4-5/12/2012*

The Cloud Select Industry Group on Certification Schemes — *Launched on 21/02/2013*

The Cloud Select Industry Group on Code of Conduct — *Launched on 10/04/2013*

The Cloud Select Industry Group on Service Level Agreements — *Launched on 21/02/2013*

Research: The Cloud Expert Group — *Now completed*

The European Cloud Partnership
- Steering Board — *Launched on 19/11/2012*
- Cloud for Europe — *To be launched In 11/ 2013*

funded
me: FP7-IC

Federal "Trusted Cloud" project

- The German Ministry of Economic Affairs and Energy has released on April 13, 2015, 12 papers on the legal framework for cloud computing

The papers address, inter alia:

- The German legal framework for cloud computing contracts
- Licensing issues
- Open source
- Liability issues
- Data protection (including an innovative concept to classify the level of privacy protection required according to the level of data sensitivity)
- Procedures for the issuance of certificates through private and public institutions
- A catalogue of possible test criteria measured against the requirements of data protection law
- Particular issues dealing with health data and Section 203 of the German Criminal Code

https://www.trusted-cloud.de/

A Digital Single Market Strategy for Europe

EUROPEAN COMMISSION

Brussels, 6.5.2015

COM(2015) 192 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A Digital Single Market Strategy for Europe

{SWD(2015) 100 final}

Extract from the Political Guidelines for the next European Commission – A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change (15 July 2014)

Priority n°2: A Connected Digital Single Market

Conclusion

- **Savings**
  - 40% up to 80% in relation to the existing costs, depends on applied "cloud computing" model
  - Companies in Europe up to 180 billion euro, more than 350 euro annually per employee
- Gartner - almost 80% of companies in USA will use some model of "cloud computing"
- will have as big influence as it has **e-business** and that this technology is placed **on the top of 10 key technologies which will influence business in the next year**

Conclusion

- Application of IT technologies in our business environment shows smaller lack behind developed countries in contemporary IT technologies usage.
  - several companies already offers cloud solutions for small and medium enterprises
- The fastest acceptance - small and medium companies,
  - relay much on IT as standard support to business processes, and have high fixed costs of IT infrastructure.
- Government has large interest to solve open questions,
  - it will open possibility of large savings in public services offered to citizens and companies, but there are still some backlogs
- e-Croatia oriented toward creation "private cloud for public administration"
  - It will stimulate different approach and speed up making new corresponding solutions.

John McCarthy – 1961:

"If computers of the kind I have advocated become the computers of the future, then computing may someday be organized as a public utility just as the telephone system is a public utility.… The computer utility could become the basis of a new and important industry."

2008, Amy Schurr observed

"organizations are switching from company-owned hardware and software assets to per-use service models" and proposed that "[the] projected shift to cloud computing…will result in dramatic growth in IT products in some areas and significant reductions in other areas."

Questions?
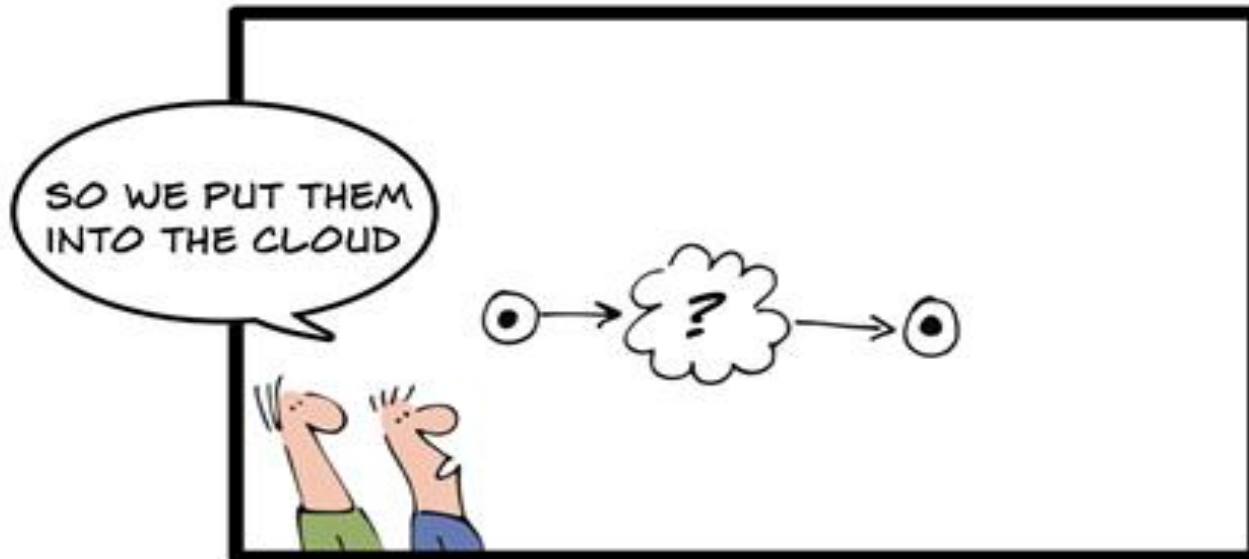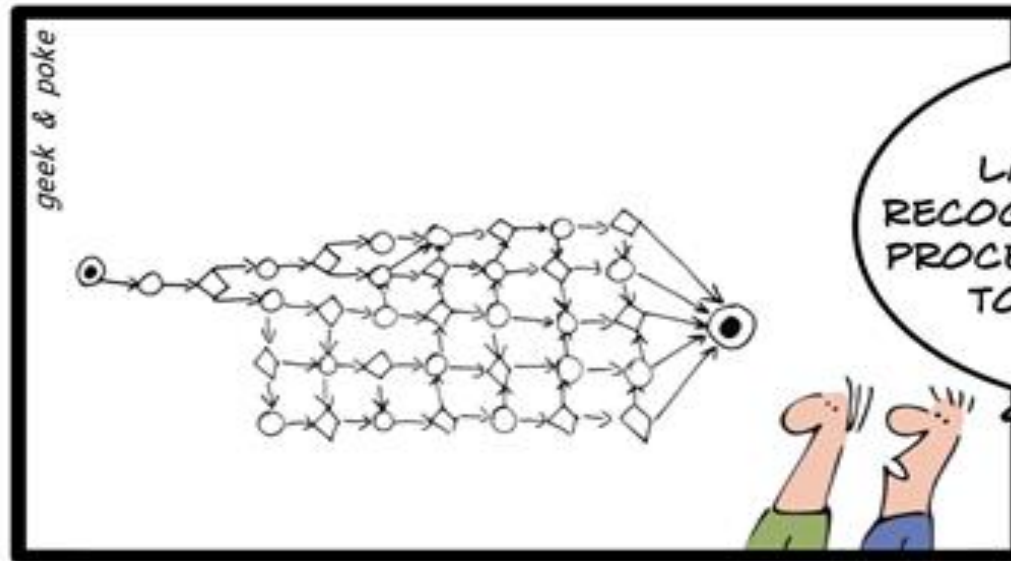
In the Cloud???
No, we are at the corner of
Jefferson and Howard Avenue.

Your DATA goes here

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