

## *Lecture 7*

# Mobile Surveillance, Data Protection, and Identity Management

Mobile Business II (SS 2016)

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- Governmental agencies more and more enforce surveillance of communication (“Me too”-Approach).
- Privacy and Security of communication is essential to protect citizens from unlawful surveillance.
- Identity Management Systems help to protect the user from possible threats.

- Surveillance
  - Legitimation and Types of Surveillance
  - Public Agencies (“Bedarfsträger”) and their Control
  - Legal Foundations
  - Practice
  - Conflicts
- Data Protection & Privacy
  - Terminology and Background
  - Telecommunications Area
  - Implementation
- Identity & Mobile Identity
  - Identity Concepts
  - Identity Management Systems
  - Interdisciplinary Aspects of Mobility and Identity

## Why “Surveillance”?

- Fight organised crime:
  - Investigation
  - Prevention
- Socio-political goals:
  - Protect democracy from extremists (e.g. surveillance of the NPD, Al-Qaida, etc.),
  - Keep up preparedness of the military services,
  - Protection from foreign intelligence services.



Bundeskriminalamt



Bundesnetzagentur

- Eavesdropping
- Storage and analysis of connection data
- Automated content analysis (BND)
- Identification of mobile phone users and eavesdropping (IMSI Catcher)
- Data retention
- Determination of the location of callers

We do not cover “bugging” or the manipulation of information technology for surveillance. These issues are regulated in Article 13 GG and § 100 StPO.

# Who is executing Surveillance?

- Eavesdropping is performed by some specific public agencies (in German called “Bedarfsträger”), e.g.:
  - Police
  - Intelligence services (e.g. Federal Intelligence Service (Bundesnachrichtendienst – BND))
  - Federal Office for the Protection of the Constitution (Bundesamt für Verfassungsschutz – BfV)
  - Via Europol as administrative assistance for foreign authorities
- External supervision of these agencies
  - is needed and has been implemented to some degree,
  - is not trivial due to the secret nature of the agencies’ tasks.

- **Public agencies** (“Bedarfsträger”) are under the control of a ministry.
- The **parliamentary control commission** („Geheimdienstausschuss“) reviews the actions of the intelligence services.
- The **Federal Commissioner for Data Protection** represents the citizen's interests.
- When investigating according to the code of criminal procedure (StPO - Strafprozess-Ordnung) § 100:
  - The **obligation to inform** the surveyed person by the public agencies is regulated in § 101 StPO.
  - **Notification within 6 months** - exceptions may apply.

- The Federal Office for the Protection of the Constitution is controlled by:
  - The **minister of the interior** responsible towards the parliament,
  - The **parliament** itself,
  - The **Federal Commissioner for Data Protection** or the **Commissioner for Data Protection** of the states (“Länder”).
- This control is not executed in public!
  - **Problem:** Lack of transparency
  - **Example:** Incidents with regard to the surveillance of the NPD (e.g. “V-Mann Affäre”)



## Distinction between two types:

- Investigation
  - Federal prosecutor and judge approve requests.
  - Federal Network Agency (“*Bundesnetzagentur*”) acquires connection data.
- “Danger ahead” principle (special urgency)
  - In cases of special urgency, the investigator can refer to the “danger ahead” (“*periculum in mora*”) principle.
  - The officer-in-charge (security administrator) at the company (provider) decides, cooperates, and notifies authorities.

- **Article 10 *Constitution* (“Grundgesetz”)**
  - Privacy of correspondence, posts and telecommunications
- **§ 100 of the *Code of Criminal Procedure* (StPO) defines in which cases communication surveillance is allowed and how it has to be conducted.**
  - Comprehensive framework with rules and regulations.
  - Measures have to be approved by the prosecutor and the judge, otherwise they cannot be used in court.
  - The *Telecommunications Traffic Surveillance Ordinance* (TKÜV) regulates the general process.



- **Telecommunications Traffic Surveillance Ordinance (TKÜV)**
  - Reference to § 110 and § 111 TKG
  - Affects telecommunication providers that offer network access to the public (TKG § 110 (6))
  - Affected:
    - Every Internet provider (also including universities and other public bodies offering network access)
    - Hotels/hospitals that offer phone services to their guests/patients

- **Federal Intelligence Service Law (BND-Gesetz – BNDG)**

- The Federal Intelligence Service (BND) collects and analyses information of foreign countries, which are of interest with regard to foreign and national security affairs.
- The BND is authorised to use the means of the Federal Office for the Protection of the Constitution (BfV), if these are necessary to fulfil their duties.
  - This includes, for example, the methodical interception of foreign phone calls.
- The BND has to follow the statutes of the Federal Data Protection Act (BDSG).

- **Foreign Trade and Payments Law (AWG) – Control of Exports**
  - For the control of the violation of export controls and for their penalisation: § 39 AWG restricts the secrecy of telecommunications.
  - Public agency: *Customs Criminological Office*
  - Controlled by the public attorney's office
- **International Treaties**
  - Treaties such as the “European Mutual Assistance“ for Europol extends the public agencies (“Bedarfsträger”) by administrative assistance to European agencies.
  - Data protection and surveillance become an international topic.

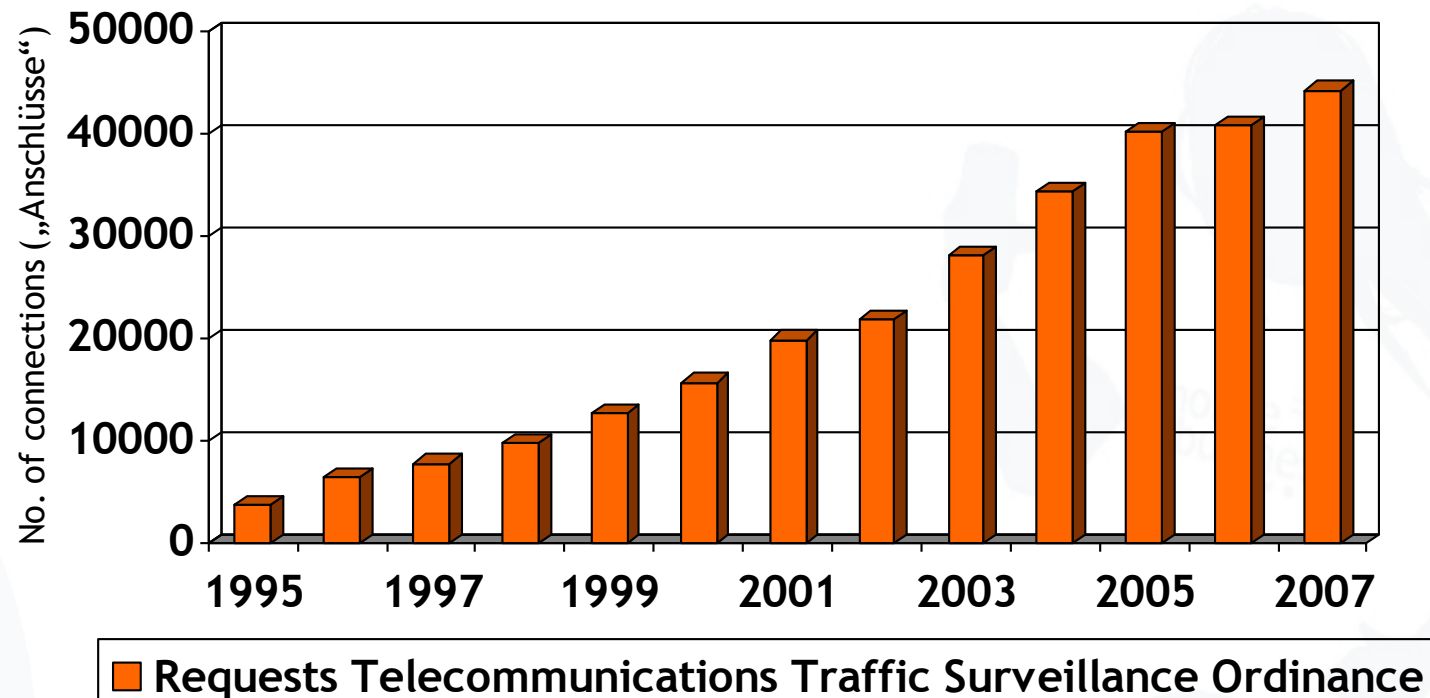
# Queried Telephone Connections (1995 - 2007)

- Compared to 1995, the requests have increased by nearly 1000%, for 2007 an increase of 10% compared to the previous year could be observed.
- Partly the increase is explained by the increase of mobile phone connections.
- There is no evidence that there is an increased success-rate of the investigations
- From 2008 on Bundesamt für Justiz is responsible and counts surveillance requests instead of connections.



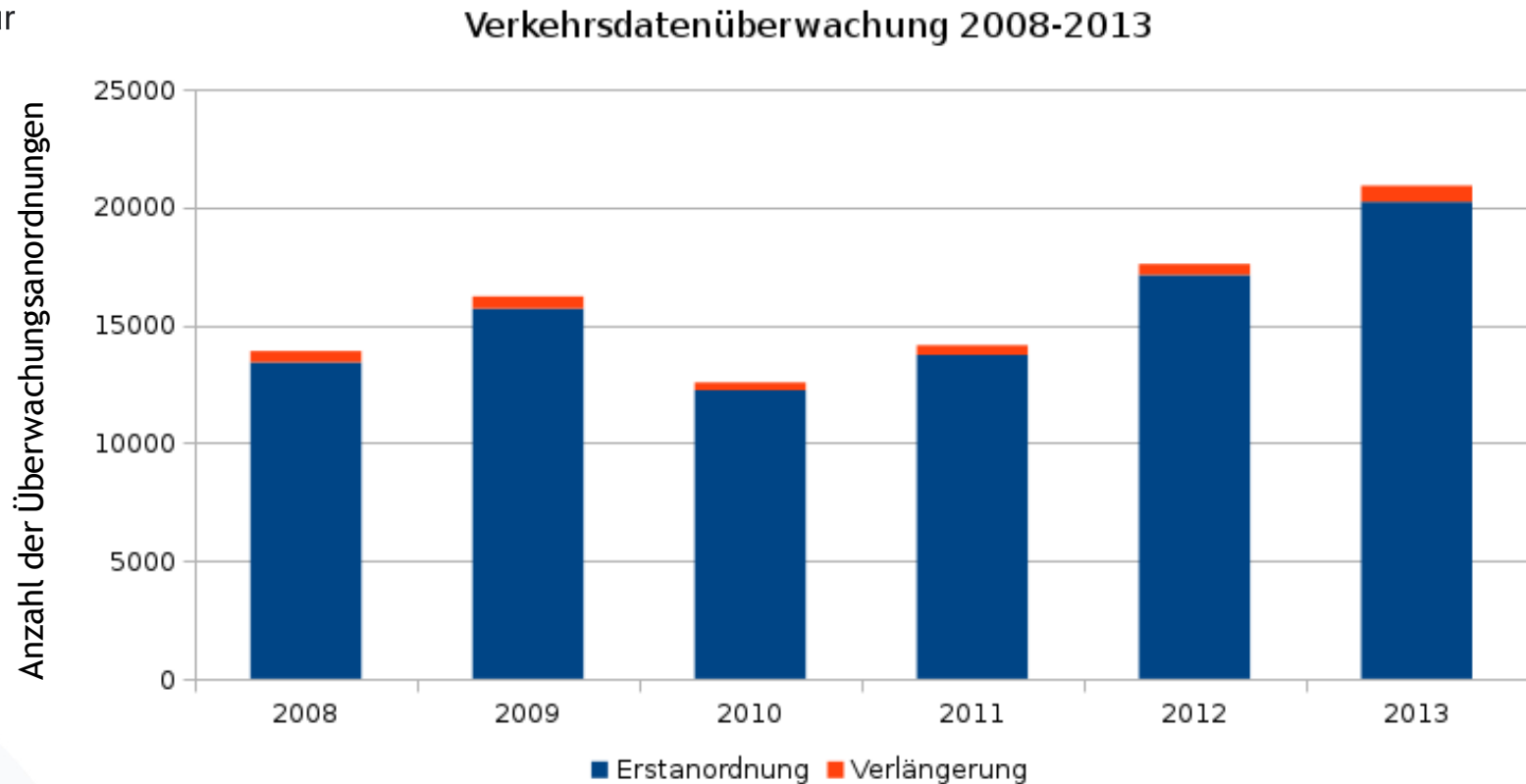
Bundesnetzagentur

[AIDK03],  
[CCCB07] &  
[BNA09]





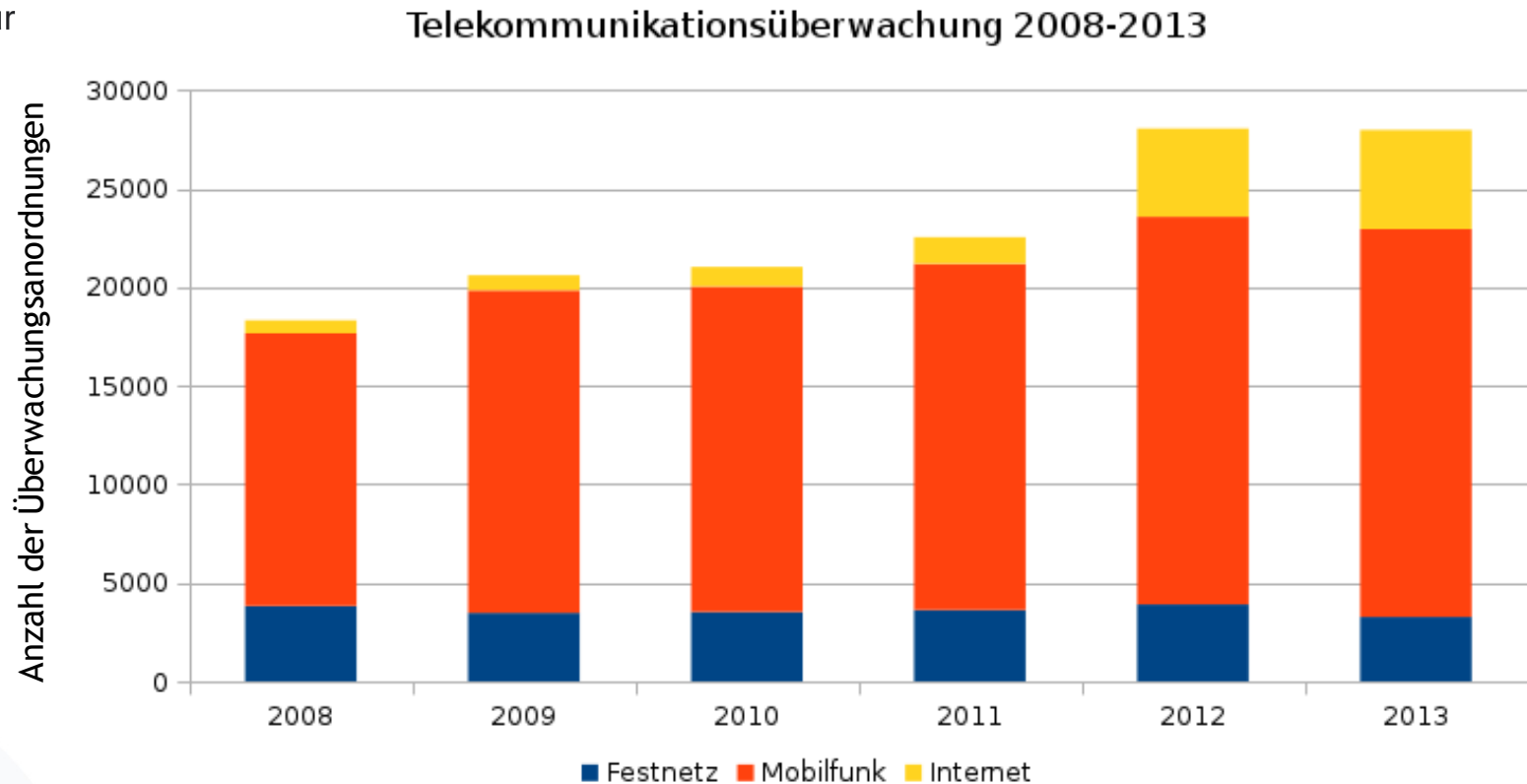
Bundesamt für  
Justiz



# Surveillance per communication channel (2008 - 2013)



Bundesamt für  
Justiz



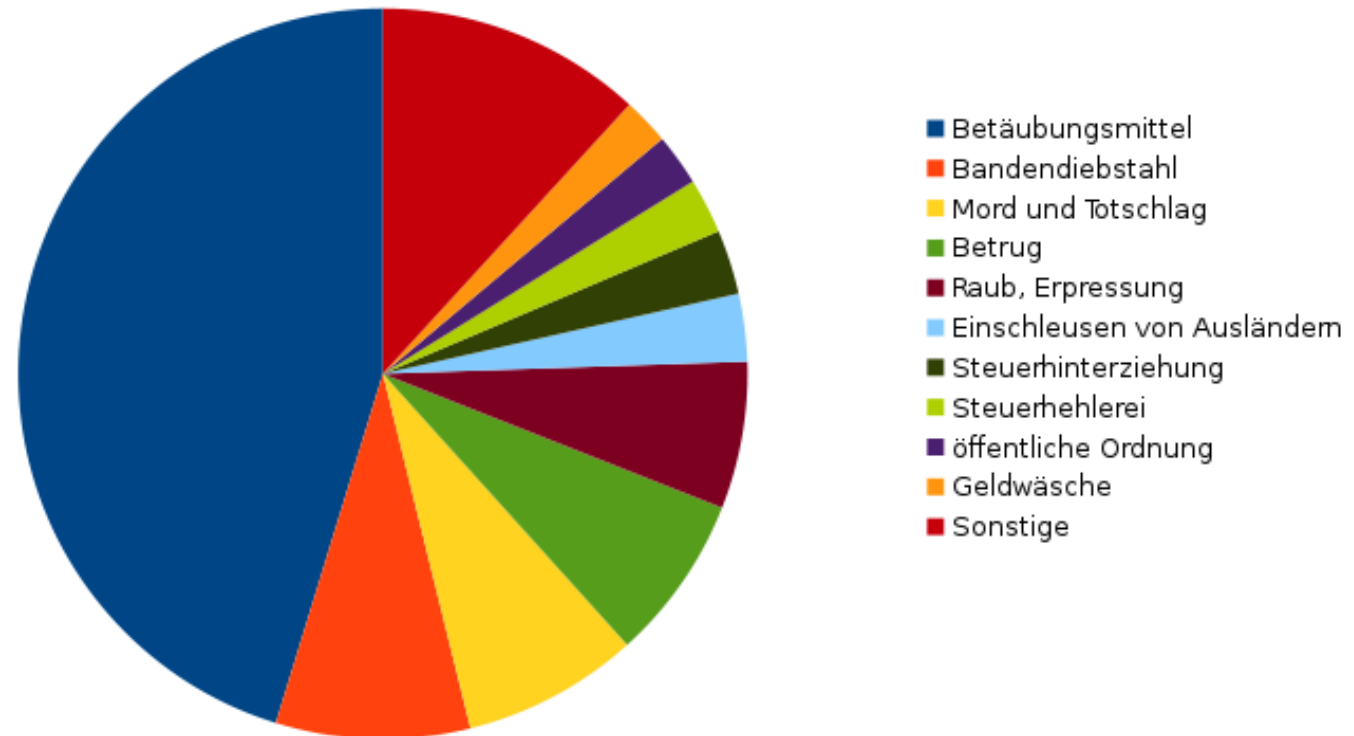


# Types of investigations reported as reason for surveillance queries



Bundesamt für  
Justiz

Straftaten Telekommunikationsüberwachung 2013



- **Constitutional complaint (“Verfassungsbeschwerde”) against TKG**
  - § § 111-113 TKG to some extent violate constitutional rights according to the Federal Constitutional Court of Germany
  - Constitutional complaints are an extraordinary remedy for the protection of constitutional rights.



24.02.2012 09:58

## Karlsruhe beschränkt Verwendung von Telekommunikationsdaten UPDATE

 vorlesen / MP3-Download

Die Regelungen zur Speicherung und Herausgabe von Nutzerdaten, Passwörtern und PIN-Codes an Ermittlungsbehörden und andere staatliche Stellen sind teilweise verfassungswidrig (Az. 1 BvR 1299/05). Das hat der Erste Senat des [Bundesverfassungsgerichts](#) in einem am Freitag [veröffentlichten Beschluss](#) entschieden. Die Regeln verletzen zum Teil das Grundrecht auf informationelle Selbstbestimmung.

**[Update:** Schluss macht Karlsruhe mit der nach Ansicht der Kammer "verbreiteten aber umstrittenen Praxis", §113 auch für Auskünfte über den Inhaber einer IP-Adresse heranzuziehen: Die Regelung "berechtigt [...] nicht zu einer Zuordnung von dynamischen IP-Adressen", entschieden die Richter, auch weil dies einen Eingriff ins Fernmeldegeheimnis darstelle. Der Gesetzgeber hat hier bis Juni 2013 Zeit, eine verfassungskonforme Neuregelung zu schaffen.

Kassiert hat das Gericht zudem eine in §113 Satz 2 geregelte spezielle Auskunftspflicht der Provider gegenüber Strafverfolgern und Geheimdiensten, die Zugangssicherungs-codes wie Passwörter oder PINs betraf. Das ist nach Ansicht der Richter nicht mit dem Recht auf informationelle Selbstbestimmung vereinbar, "weil sie nicht den Anforderungen des Verhältnismäßigkeitsgrundsatzes genügt". Der Zugriff auf diese Daten sei in dem derzeit geregelten Umfang "für die effektive Aufgabenwahrnehmung dieser Behörden nicht erforderlich". Die Vorschrift erlaube den Behörden Zugriff, ohne die Voraussetzungen dafür zu regeln. Auch hier hat das Verfassungsgericht eine Übergangsfrist bis Ende Juni 2013 angeordnet.

**Due to the diffusion of mobile phones,  
investigators have new problems:**

- Phone number is not linkable to a person's location.
- Relation between a person and a mobile phone is not fixed.

➔ Therefore public agencies try to get quick access to the circumstances and content of the communication.

***Solution:*** “IMSI-Catcher” by Rohde & Schwarz

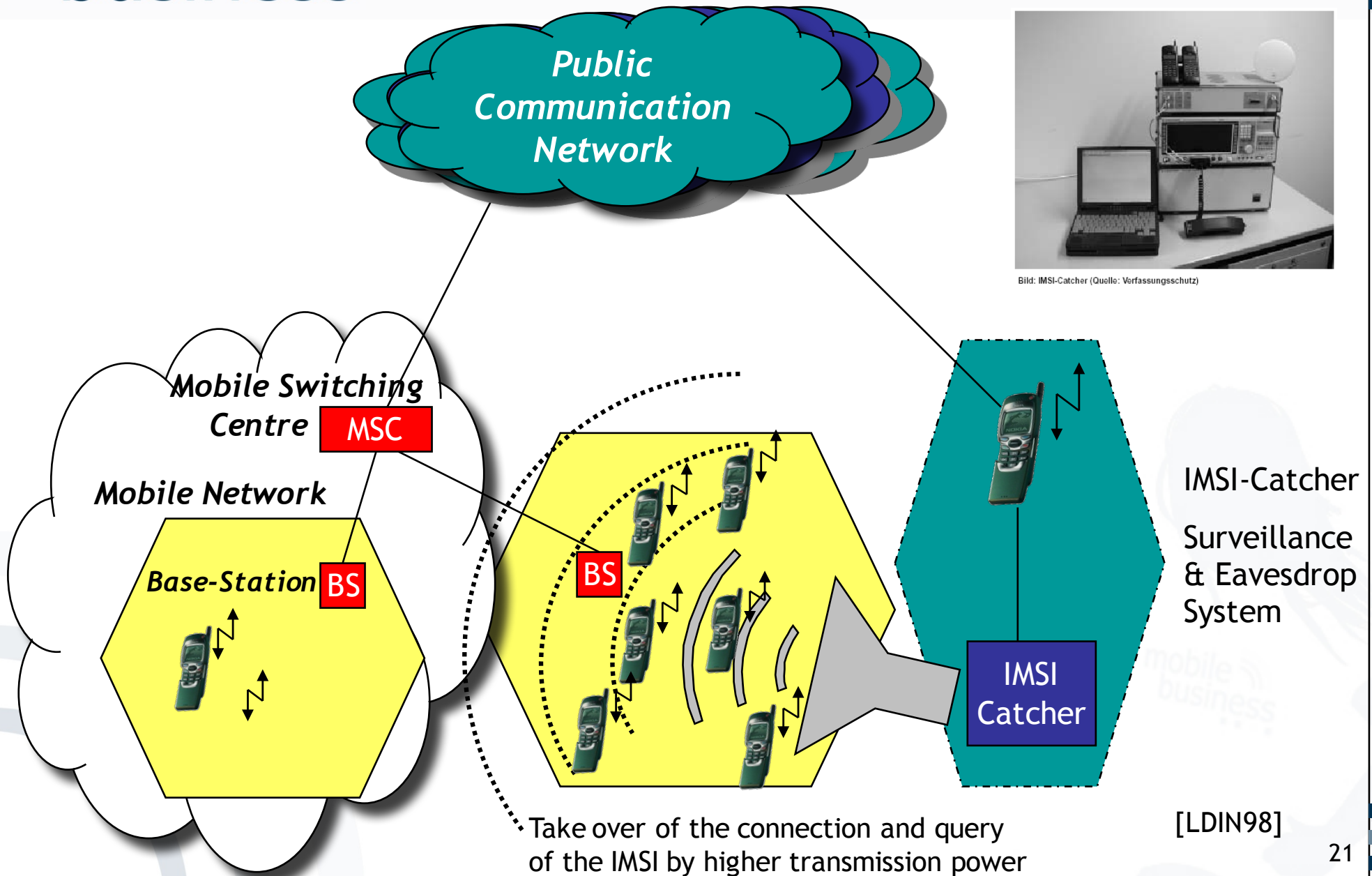
“IMSI-Catcher” by Rohde & Schwarz simulates a strong base station, causing all mobile phones in the network of the respective operator to connect to this simulated base station.

- ➔ The person to be observed can be identified via the IMSI of the SIM, which can be queried at the mobile operators' databases (if the operator is in a cooperating country).
- ➔ Interception of the communication

## ■ Problems

- ...with the constitution due to the rerouting of phones of persons that are not being observed.
- ...due to technical interferences between the IMSI catcher and normal base stations

# IMSI-Catcher: Functionality



German newspaper:

“O2 berechnet Überwachten das Abhören”

“ Bei der Überwachung von mutmaßlichen Extremisten und Straftätern durch Polizei und Geheimdienste hat es einen peinlichen Fehler gegeben. Die Verdächtigen konnten auf der Telefonrechnung für ihr Handy erkennen, dass sie abgehört wurden. ”

München - Die Betroffenen hätten wegen einer technischen Panne kürzlich eine Rechnung des Telefonanbieters O2 bekommen, in der Verbindungen zu einer unbekannten Mailbox aufgelistet waren, berichtet die "Süddeutsche Zeitung" unter Berufung auf Sicherheitskreise. Rund 50 Personen seien die Kosten für gegen sie gerichtete Abhöraktionen in Rechnung gestellt worden. [...]

Nach Angaben der Zeitung werden derzeit in Deutschland fast 20.000 Telefonanschlüsse von der Polizei und den Geheimdiensten abgehört. Besonders nach den Terroranschlägen vom 11. September 2001 in den USA habe die Zahl zugenommen.

- The security administrator is the mediator between the company's and the customers' interests and the government's interests:
  - Responsibility for the security of the infrastructure
  - Contact person and in charge of dealing with surveillance requests in the case of urgency ("danger ahead")
  - Conflict between potential "breach of the secrecy of telecommunications" and "the obstruction of investigations"



## Connection-queries search account databases

- **Example:** „All calls to phone number  $n$  at the point of time  $t$ “ searches the complete account database (due to data protection data is stored as „ $a$  calls  $n$  at time  $t$ “).
- ➔ ***Results in tremendous costs for the servers and the database licences.***

## The interception of phone-calls causes costs:

- Provision of online access
- Purchasing of cryptography hardware (Elcrodat) and maintenance personnel with security clearance
- 24h-availability of the infrastructure



- Since 1997, the Federal Network Agency demands:
  - Buyers of a Prepaid-SIM have to identify themselves by showing an official photo identification.
  - The ID number of the identification document has to be stored in an adequate way by the provider.
  - Name and address according to the proof of identity, the related number as well as other identification credentials for telecommunications have to be transferred to the directory immediately ( § 90(1) TKG).
  - The telecommunication services may only be activated, once the identification process is finalised.
- Providers took legal actions:
  - Won at first instance.
  - Lost at second instance.
  - Won at third instance.
- ➡ Finally, the law was changed.

# Denial of the Enforced Registration of Prepaid-SIMs in 3rd instance (1)

Urteil: Anonyme Prepaid-Handys erlaubt - Golem.de - Microsoft Internet Explorer

Adresse <http://www.golem.de/0310/28106.html>

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ALTANA Pharma  
Oranienburg GmbH,  
Oranienburg

Unternehmen/Märkte 23.10.2003, 09:49

## Urteil: Anonyme Prepaid-Handys erlaubt

### Keine Verpflichtung zur Erhebung von Kundendaten

Das Bundesverwaltungsgericht in Leipzig hat darüber entschieden (BVerwG 6 C 23.02 - Urteil vom 22. Oktober 2003), dass Anbieter von Mobilfunkleistungen, die diese Leistungen auf der Grundlage so genannter Prepaid-Produkte anbieten, nicht verpflichtet sind, personenbezogene Daten ihrer Kunden zu erheben und nach Überprüfung in eine Kundendatei einzustellen.

Da der Kunde auf bei Prepaid-Handys für den Erhalt der Mobilfunkdienstleistungen in Vorleistung tritt, ist für das Telekommunikationsdienstleistungsunternehmen - anders als bei Standardverträgen - die Erhebung und Verarbeitung personenbezogener Daten der Kunden für die Begründung und Abwicklung des Vertragsverhältnisses eigentlich nicht erforderlich.

- Revision of the providers (especially Vodafone) at the Federal Administrative Court Leipzig
- Decision on the 22<sup>nd</sup> of October 2003
- Guideline:

“ Die **Pflicht** der Anbieter von Telekommunikationsdiensten, im öffentlichen Strafverfolgungs- und Sicherheitsinteresse Kundendateien zu führen und in diese bestimmte, dem automatisierten Abruf durch die Regulierungsbehörde für Telekommunikation und Post unterliegende Daten aufzunehmen, **betrifft nur diejenigen Daten ihrer Kunden**, die sie zuvor nach Maßgabe des für die Vertragsabwicklung **Erforderlichen in zulässiger Weise erhoben** haben. ”

Die Anbieter sind **nicht darüber hinaus zur Erhebung** der einschlägigen Daten bei den Kunden **verpflichtet**.

- Increased information surveillance not in proportion with the investigations' success rate? [AIDK03]
- Telecommunications data retention
  - Without an explicit cause, telecommunications data retention is unacceptable and unconstitutional according to the Federal Constitutional Court of Germany (BVerfG, 1 BvR 256/08, 2.3.2010).
- Prepaid-SIM registration is required by the legislator.
- Ineffectiveness of these measures due to foreign anonymous prepaid cards?
- In future: Who controls and surveys the location data?

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- **Definition:**

Measures for the protection of stored and transferred personal data against manipulation or misuse; Federal Data Protection Act in place since 1978 (amendment in 1990).

- Originally for the protection of the citizen against governmental institutions.
- Businesses are regulated with regard to special aspects (telecommunications, medicine) of data protection.
- Increased need for regulation due to the use of information technology (data warehouses, globalisation of information processing).

- **Data minimisation:**  
The service should be offered with a minimum of needed data.
- **Information of data subject:**  
The person, whose data is being stored, should know what has been stored.
- **Acceptance not without consent:**  
The data subject is to be asked in advance.
- **Right to be forgotten and to erasure:**  
The individuals' right to ask service providers to erase personal information. [EuCo2012]



- Both terms are related but not synonymous and have many definitions.
- 2 popular ones:
  - **Data protection** is the protection from harmful and unsolicited usage of data linked to the personal sphere of a person.
  - **Privacy** is the right to be left alone, e.g. to be unwatched or anonymous. [WaBr1890]
- More work is needed on a complete understanding of privacy.
- Nevertheless the topic is important, as one can see from related incidents and activities to address the issue.



- **Ensuring the rights of freedom:**
  - Right of informational self-determination as a fundamental human right, derived from the Constitution (Grundgesetz) - “Volkszählungsurteil” (BVG83)
  - Protection against too extensive governmental control

- **Societal perspective**
  - Foundation of Democracy
  - Freedom of Speech
- **Individual perspective**
  - Free personal development
  - Ownership of personal data of any kind
- But in an information society, it takes effort for individuals to protect their privacy.



# Privacy Online vs. Offline



## ■ Offline Privacy

- In the offline world individuals are able to maintain their privacy intuitively.



## ■ Online Privacy

- In the online world, privacy
  - has to be maintained through complex privacy settings or identity management.
  - often cannot be maintained at all by individuals because personal data is collected even without their knowledge.

- The Internet does not forget or is sometimes not allowed to do so (data retention).
- The Internet allows to easily connect social roles or partial identities, which would have been separated in the offline world.
- Profiling is easy and can be done automatically
  - managing personal information is complex and has to be done manually.



- Data Protection (EU / Germany)
- Technical Data Protection
- Privacy by Design
- Identity Management



- **European General Data Protection Regulation (GDPR)**

- Commission draft published on 25 January 2012
- Aims to address the concerns of internet users frequently giving away their personal information, e.g. disclosure of information on Social Network Sites (SNS)
  - Introducing the “Right to be forgotten”.
  - Data security lapses by organisations must be reported. [EuCo2012]
  - Breach of data security in organisations may result in a fine of up to 2% of annual worldwide turnover.
- Published on 4 May 2016 in the Official Journal of the European Union (Regulation (EU) 2016/679)
- It will supersede the Data Protection Directive 95/46/EC to establish a **unified European data protection law** and it will apply from 25 May 2018.

- Note:

A **regulation** is a legislative act of the European Union that becomes immediately enforceable as law in all member states simultaneously. Regulations are self-executing and do not require any implementing measures. [Source: Wikipedia]



- The European Commission says that the regulation “puts the citizens back in control of their data, notably through”:
  - **A right to be forgotten:** Users will have the right to demand that data about them be deleted if there are no "legitimate grounds" for it to be kept.
  - People will have **easier access to their own data**, and will find it easier to transfer it from one service provider to another.
  - **Putting people in control**
    - Organizations must notify the authorities about data breaches as early as possible, "if feasible within 24 hours".
    - In cases where consent is required organizations must explicitly ask for permission to process data, rather than assume it.
  - **Privacy by design and by default** - privacy friendly default settings to be the norm.
  - **Data controllers have more responsibilities** (data breach notification, appointing data protection officer, privacy impact assessments, implementing right to be forgotten, PbDs)

- **Directive on Privacy and Electronic Communications (E-Privacy Directive)**
  - **Directive 2002/58** on Privacy and Electronic Communications with regard to data retention, spam and cookies
  - Amended by **Directive 2009/136** introducing several changes, e.g. more protection on the use of cookies: **Websites are now required to obtain the consent of users before cookies can be installed on a user's hard drive.**
  - Different opinions whether current situation in Germany ("Telemediengesetz") is compliant with the directive or not.





## EU Directives related to Personal Data and Privacy (2)



### Directive 2009/136

*“Member States shall ensure that the storing of information, or the gaining of access to information already stored, in the terminal equipment of a subscriber or user is only allowed on condition that the subscriber or user concerned **has given his or her consent**, having been provided with **clear and comprehensive information**, in accordance with Directive 95/46/EC, inter alia, about the purposes of the processing.”*

# EU Directives related to Personal Data and Privacy (3)



- “Cookie Legislation” differs across Europe.
- Current ruling in Germany: **Opt-in** needed for cookies collecting personal information, but **opt-out** is sufficient for all other types of cookies → grey area!  
[Cook2015] [Baum2014]
- 2011: Questionnaire from EC on the implementation of the respective article of the ePrivacy directive was answered by German federal government: Existing legislation sufficient to comply with the directive, no need to change the law.
- 2014: Statement upheld



Die  
Bundesregierung



German Bundestag  
opposition's  
legislative initiative  
in 2012:

Aiming to make  
German laws  
compliant with EU  
regulation.

The screenshot shows the official website of the German Bundestag. At the top, there is a search bar with the placeholder text 'Suchwort eingeben'. Below the search bar is a navigation menu with the following items: 'Der Bundestag', 'Dokumente', 'Mediathek', 'Kultur & Geschichte', 'Presse', and 'Besuche'. The main content area displays a news article titled 'SPD-Vorstoß zum besseren Schutz vor "Cookies" erfolglos'. The article is dated 29.02.2012 and is categorized under 'Aktuelle Meldungen (hib)'. The text of the article discusses a failed motion by the SPD faction to improve protection against cookies in the internet, mentioning a legislative initiative and the opposition's stance.



1. **Intention and notification:** The processing of personal data must be reported in advance to a Data Protection Authority.
2. **Transparency:** The person involved must be able to see who is processing her data for what purpose.
3. **Finality principle:** Personal data may only be collected and processed for specific, explicit and legitimate purposes.
4. **Legitimate grounds of processing:** The processing of personal data must be based on a foundation referred to in legislation, such as permission, agreement, and such.
5. **Quality:** Personal data must be as correct and as accurate as possible



6. **Data subject's rights:** The parties involved have the right to take cognisance of and to update their data as well as the right to raise objections.
7. **Processing by a processor:** This rule states that, with the transfer of personal data to a processor, the rights of the data subject remain unaffected and that all restrictions equally apply to the processor.
8. **Security:** A controller must take all meaningful and possible measures for guarding the personal data.
9. **Transfer of personal data outside the EU:** The traffic of personal data is permitted only if that country offers adequate protection.

- 27th International Conference of Data Protection and Privacy Commissioners
- 2005-09-14/16 in Montreux, Switzerland
- “The protection of personal data and privacy in a globalised world: a universal right respecting diversities” [Source: ICDPPC (2005)]
- Agreement on 11 principles by participating data protection and privacy commissioners



- Lawful and fair data collection and processing,
- Accuracy,
- Purpose-specification and -limitation,
- Proportionality,
- Transparency,
- Individual participation and in particular the guarantee of the right of access of the person concerned,
- Non-discrimination,
- Data security,
- Responsibility,
- Independent supervision and legal sanction,
- Adequate level of protection in case of transborder flows of personal data.

## Germany: Federally organised data protection



- Responsibility in Germany:  
Federal Commissioner for Data Protection and Freedom of Information (BfDI)
- Each state in Germany has its “Länder” Data Protection Commissioner.
  - Specialisation on certain fields, e.g. in Schleswig-Holstein (ICPP) on Privacy in the Internet
- **Additionally:**  
Data protection officers within governmental administration and within companies



# The origin of data protection in Germany?



- The term “Privacy” (‘the right to be let alone’) originates from [Warren and Brandeis, 1890].
- Data protection in Germany (“Datenschutz”) originates from concerns over too much information und power in the hands of large (governmental) institutions (“Big Brother”).
- Nowadays Data protection and Privacy in Germany are based on the right of informational self determination derived from the constitution in the “Volkszählungsurteil“ [BVG 1983]).
- Germany has one of the most advanced infrastructures for Privacy but still no established German language term for Privacy beyond the (misleading “Datenschutz”).
- Some (more or less established) related terms are:
  - Privatheit
  - Privatsphäre
  - Schutz der Privatsphäre

## Telecommunications Act (TKG) (1997, amended in 2004)

- § 91 extends data protection to all professional providers of telecommunication services, incl. company telephone systems, hotels, Internet, etc.
- TKG also enables the Telecommunications *Data Protection Ordinance (TDSV)* and implements the statutes of *Directive 95/46/EG*.
- Remember: TKG also regulates the telecommunications surveillance (via TKÜV).
- Regulates
  - storage of data,
  - creation of invoices,
  - foreign usage of personal data
- ➔ Demands data minimisation when storing data.

## Telecommunications Act (TKG) (1997, amended in 2004)

- Explicit consent by the user of processing personal data as well as the right to withdrawal.
- **Services:** Regulates call forwarding, caller ID, storage of mailboxes.
- **Utilisation:** Regulations for directory-assistance services, phone books und directories.
- Defines **monetary fines** up to 500.000 €. The Federal Network Agency (Bundesnetzagentur) is authorised to control the data protection.

## Teleservices Data Protection Act (TDDSG)

- Principles
  - Formal allowance or consent of the teleservice user are prerequisites for the acquisition, the processing, and the usage of personal data.
  - Provider should acquire, process, and use no or only a limited amount of personal data.
  - The consent can also be declared electronically.
- Responsibilities of the provider
  - The user of a teleservice must be notified about the processing of his/her data.
  - Usage and payment of the teleservice must be offered anonymously, as far as they are technically possible and reasonable.
  - **User profiles are allowed only when pseudonyms are being used.**
- Right of access to personal data by the user

- Users want to keep their personal data under their control.
- Service providers want to use the customers' data for commercial purposes (e.g. customer profiles).
- The legislator demands:
  - Data protection on the one hand,
  - Surveillance and retention of data on the other hand.
  - Conflicts between expectations and regulations often arise.



***Regulation is “alive” and constantly demands new decisions.***

- Surveillance

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- **Mental identity** (ipse)
  - Researched by social/psychological sciences
  - Dynamically changing configuration reflecting, and shaped by, interactions between an individual and its environment
  - Private and endless task to go deeply in ones' own description:
    - “Only I can be responsible for acts done by me.”
    - “I remain myself by being faithful to my promises.”

[BogBes2001]

- **Procedural identity** (idem)
  - Used by technical/administrative sciences
  - Collection of formalized characteristics, which enable identification and authentication necessary for social and economic relations, as well as dealings with the authorities.
    - E.g., a person's name, marital status, date of birth, height, colour of skin or eyes, number of children, nationality, educational and professional qualifications, etc.
  - The choice of these characteristics may depend on the context, i.e. controlling authority, functional needs, etc.



- ***Tier 1 (T1):*** True ( ‘My’ ) identity
- ***Tier 2 (T2):*** Assigned ( ‘Our’ ) identity
- ***Tier 3 (T3):*** Abstracted ( ‘Their’ ) identity
- The different tiers can be distinguished by the factor ‘control’ : ***Who controls the identity?***

- *A Tier 1 (true - 'My') identity is my true and personal digital identity and is owned and controlled entirely by me, for my sole benefit.*
- *T1 identities are both timeless & unconditional.*

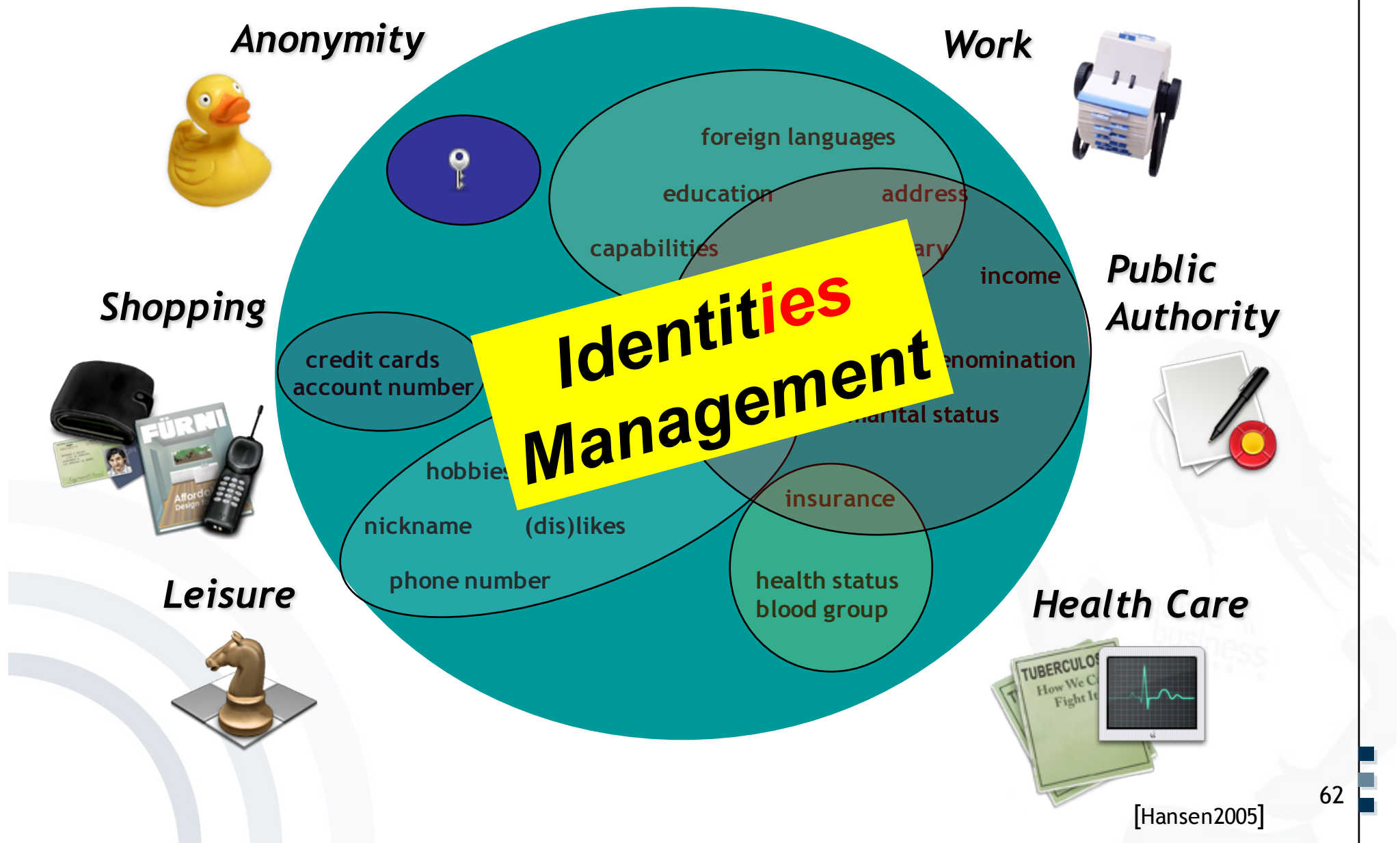
- A Tier 2 (assigned - ‘Our’ ) identity refers to our digital identities that are assigned to us by corporations (e.g. our ‘customer accounts’ ).
  - *Our* job title (assigned to us by our employer)
  - *Our* cell phone number (assigned to us by our mobile phone operator)
  - *Our* United Mileage Plus number (assigned to us by United Airlines)
  - *Our* social security number (assigned to us by the Government)
  - *Our* credit card number (assigned to us by our credit card companies)

- A Tier 3 (abstracted - 'Their') identity is an abstracted identity in that it identifies us through our demographics and other reputation like attributes, but does not need to do so in a 1:1 manner.
  - T3 identities speak to the way in which companies aggregate us into different marketing buckets for the purposes of advertising or communicating with us.
  - E.g., we're either a 'frequent buyer' or a 'one time customer' etc.
  - T3's are typically based upon our behaviour in our interactions with business.
  - The entire CRM market caters to T3 identities.

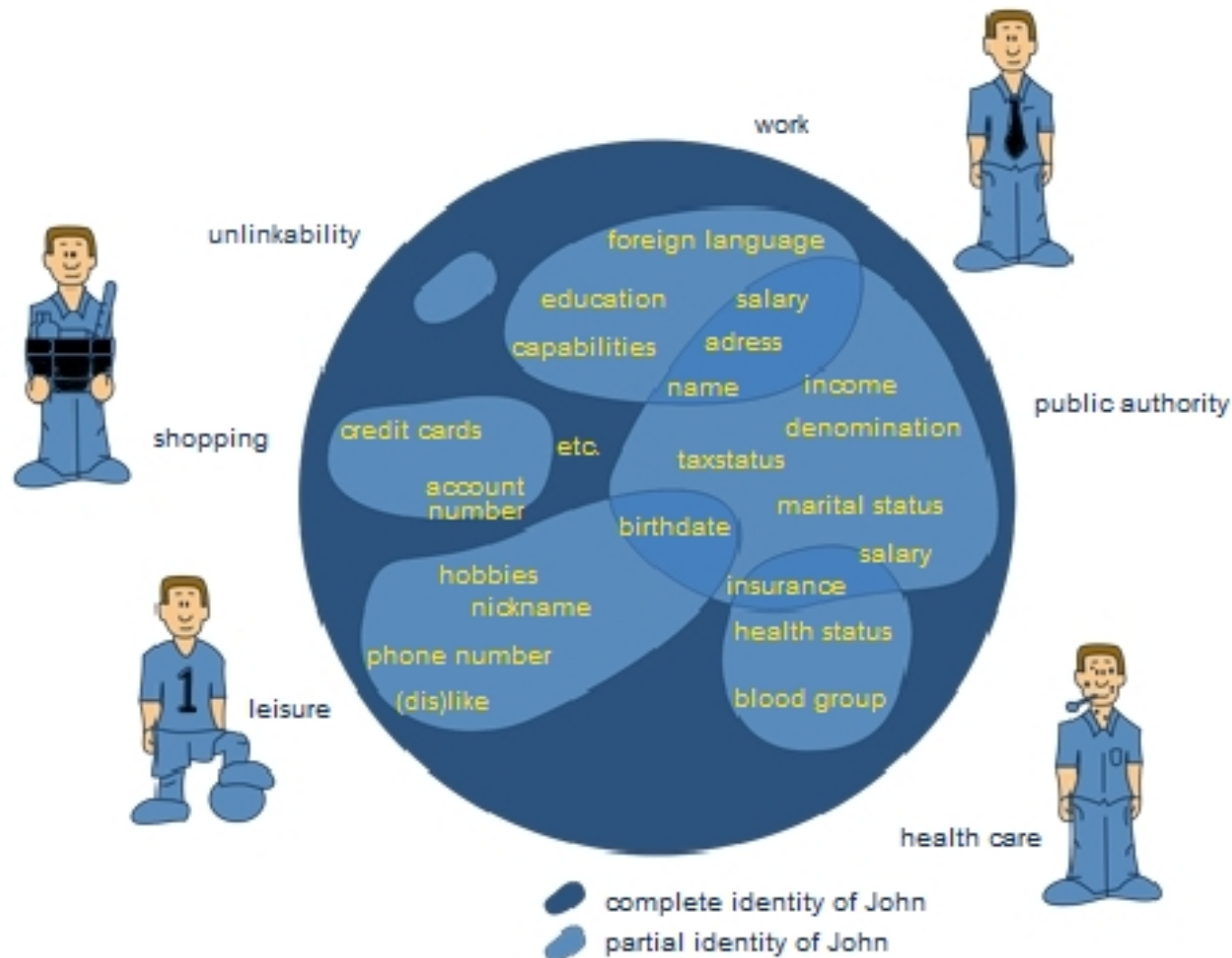
- ***Identity:***  
The characteristics (attributes) representing an acting entity
- ***Partial identity:***  
A subset of the characteristics of an identity
- ***ISO/IEC 24760 “A framework for identity management”:***
  - ***Identity (partial identity):*** Set of **attributes** related to an entity

## Why are partial identities important ?

- Different partial identities are assigned to and abstracted from an entity.
- The identity of an entity consists of partial identities distributed over different partners of the entity.



# Identity Concepts: Partial Identities Illustrated (2)



- What makes an identity mobile?
  - Location data / Context of the user
  - Temporal aspect
    - ➡ mobile identities change during their lifetime.
- Partial identities for different aspects
  - Private life?
  - Business life?

- ***Working definition:***

Mobile identities are (partial) Idem identities that are extended by location information.

[Roye06]



- A concept that links a “token/device” from the *digital/syntactical world* to an object in the *real/semantical world*



- Accompanied by a set of **properties** and attributes

Interests

Position

Age

Income

Identity Management (IdM) is often used as a ***buzz word*** that can have many meanings such as:

- The management of accounts for employees, customers or citizens. These accounts contain those parts of an identity relevant for an organization (attributes, access rights, roles, ...) → Trend towards federations between organizations
- The collection and analysis of data about individuals allowing for the extraction of useful knowledge on these individuals (profiling): → E.g., for marketing or law enforcement purposes
- The possibility of an individual to manage its procedural identities with different organizations (partial identities) and in this way allowing → To build a 'healthy' virtual socio-psychological identity.

- Identity Management Systems (IdMS) are tools that support Identity Management activities.
- We distinguish
  1. Pure IMS main objective is support of identity management functionality, e.g. MS Passport, Liberty, Shibboleth, PingID, password managers, form fillers
  2. Systems/applications with another core functionality, but basing on some identity management functionality, e.g. GSM, PGP, eBay
  3. Systems/applications independent from identity management functionality, with some identity management functionality as add-on, e.g., HTML browsers, chat clients

[BaMeHa2005, Rannen2004]

- Provisioning, Enrolling, Choosing
- Binding with Attributes
- Certifying
- Changing
- Unbinding of Attributes
- Deleting
- ...?



# Identity Management: Types of IdM (Systems)

Type 1



Type 2



Type 3



Account Management:  
*assigned identity*  
(= Tier 2)

Profiling:  
*derived identity*  
*abstracted identity*  
(= Tier 3)

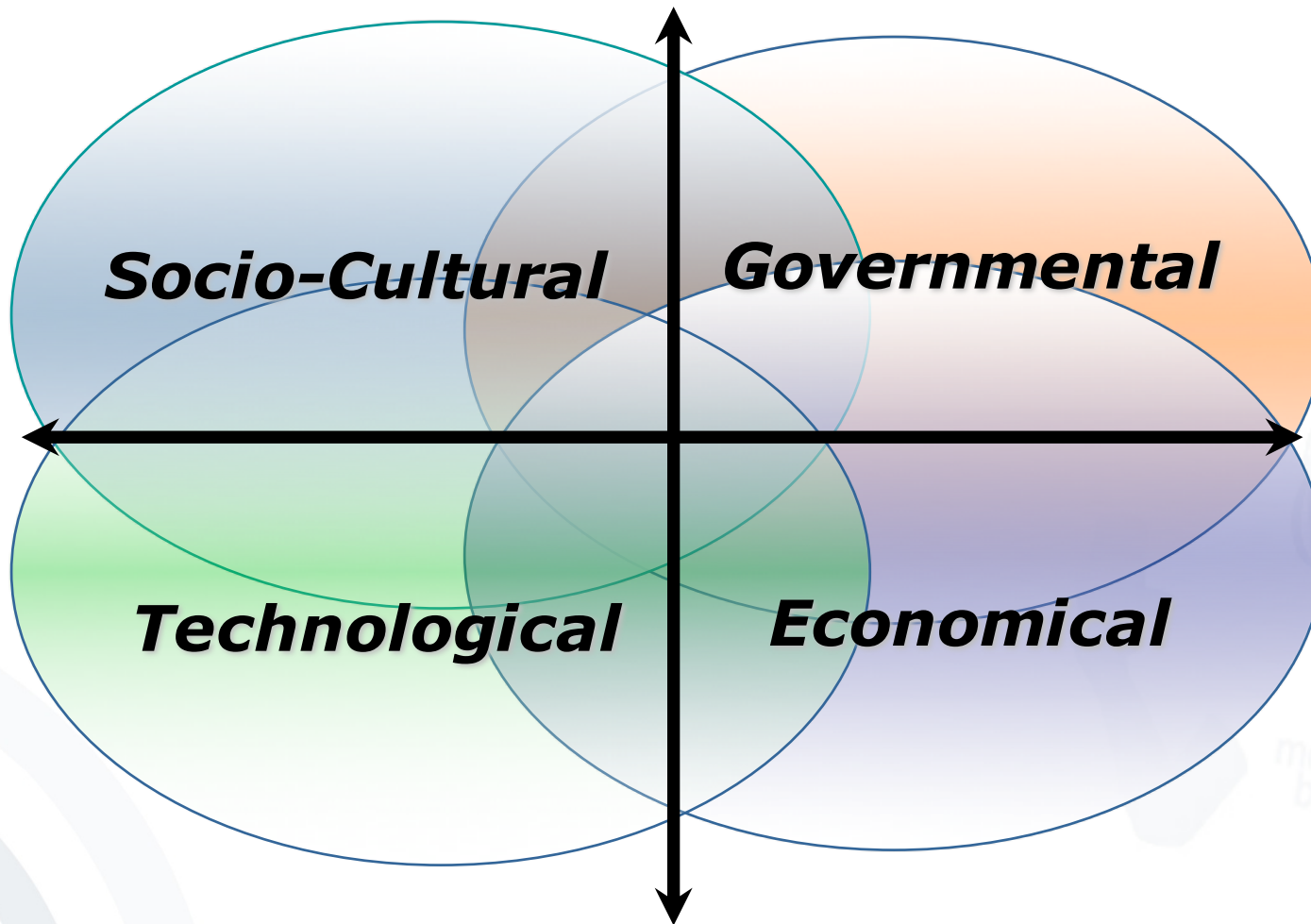
Management of  
*own identities*:  
*chosen identity*  
(= Tier1)

by organisation

by organisation

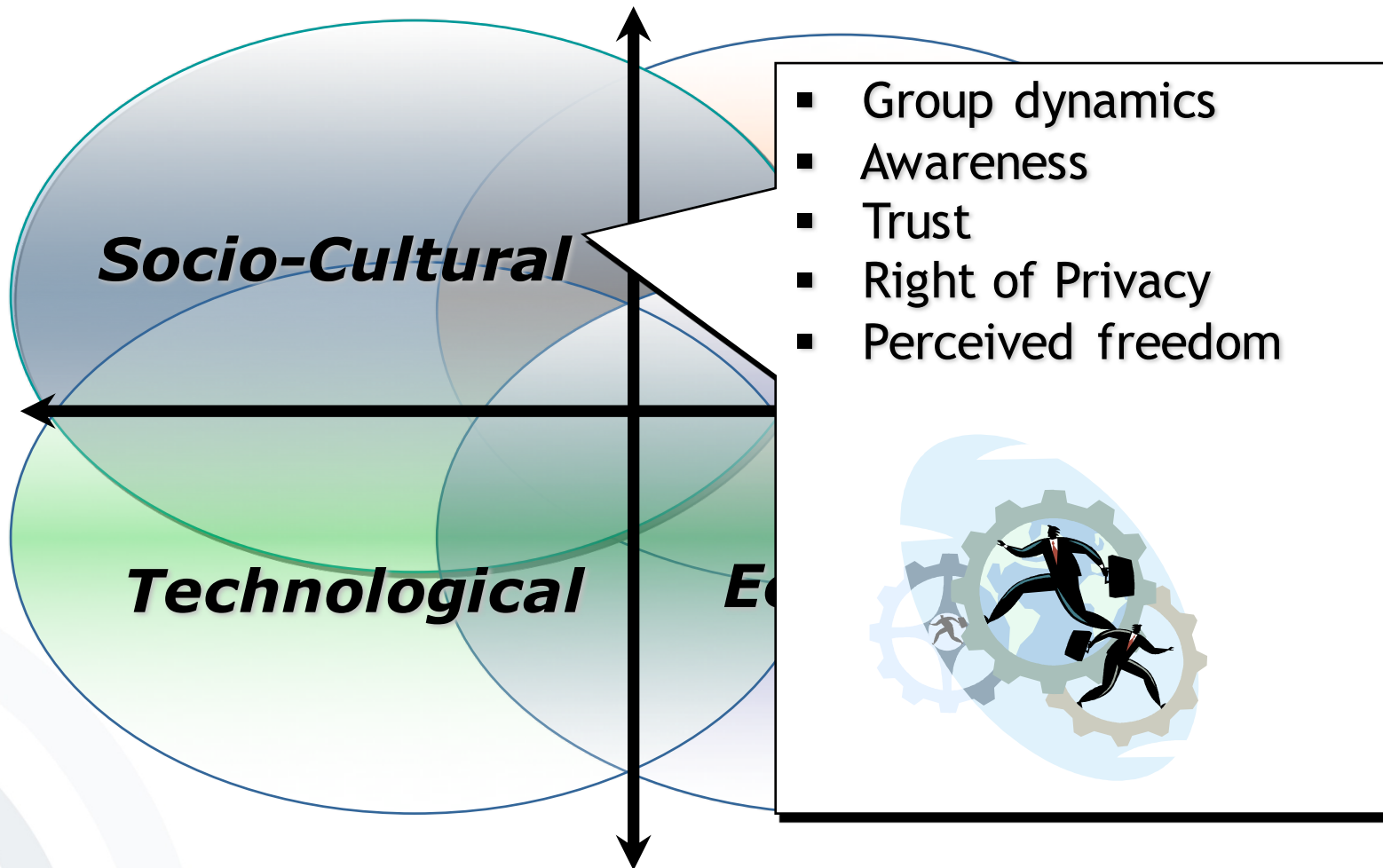
**by user himself**  
supported by  
service providers

➡ There are hybrid systems  
that combine characteristics





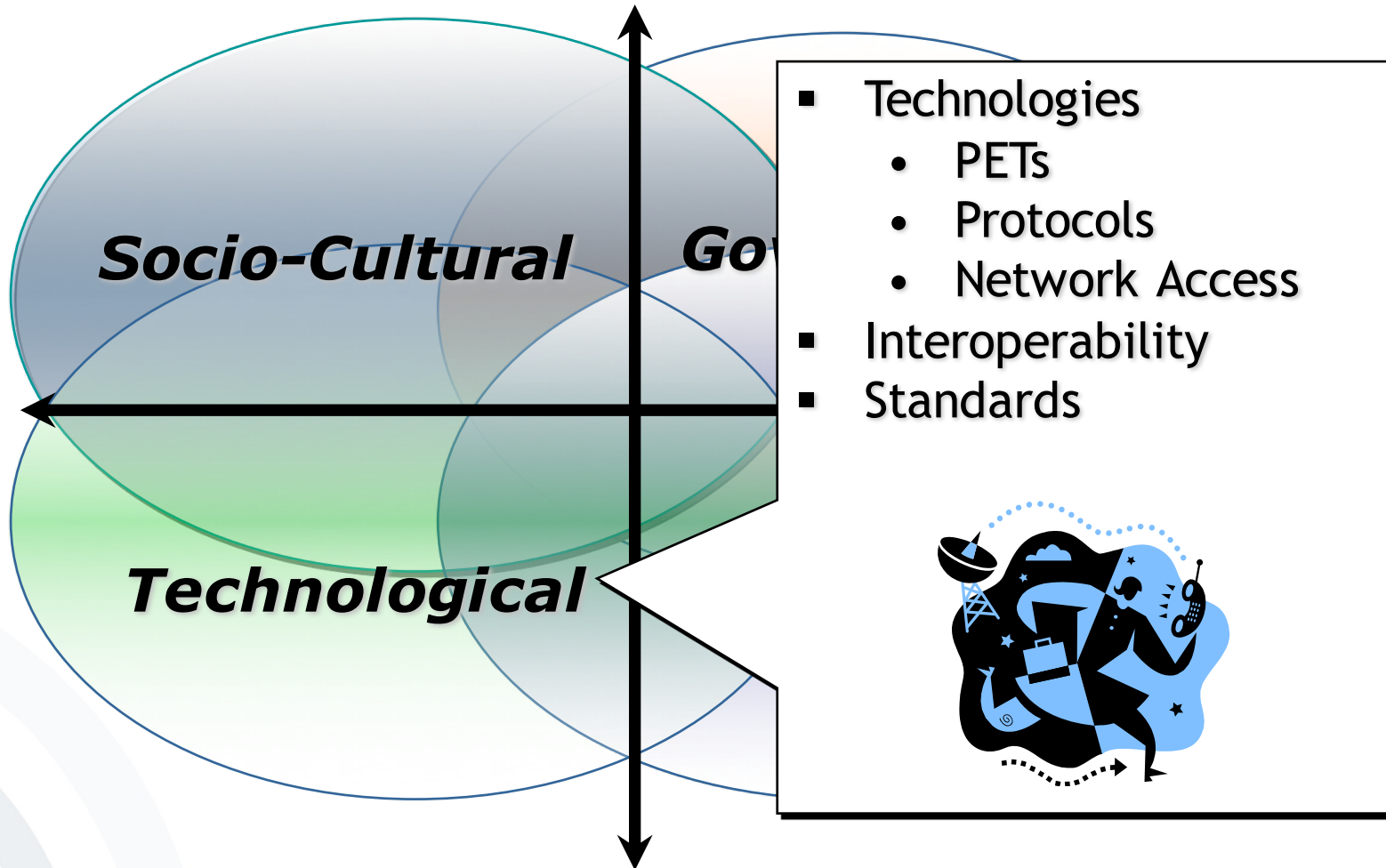
# Interdisciplinary Aspects Dimension: Socio-Cultural



- ***Concepts being observed***
  - *Idem Identity*, categorisation
  - *Ipse Identity*, sense of self
- Analysis of conceptual and sociological issues of the impact of idem-identification on ipse-identity, in the case of mobile devices; e.g.:
  - How someone establishes communication using mobile devices, and
  - how we/others perceive ourselves/us.



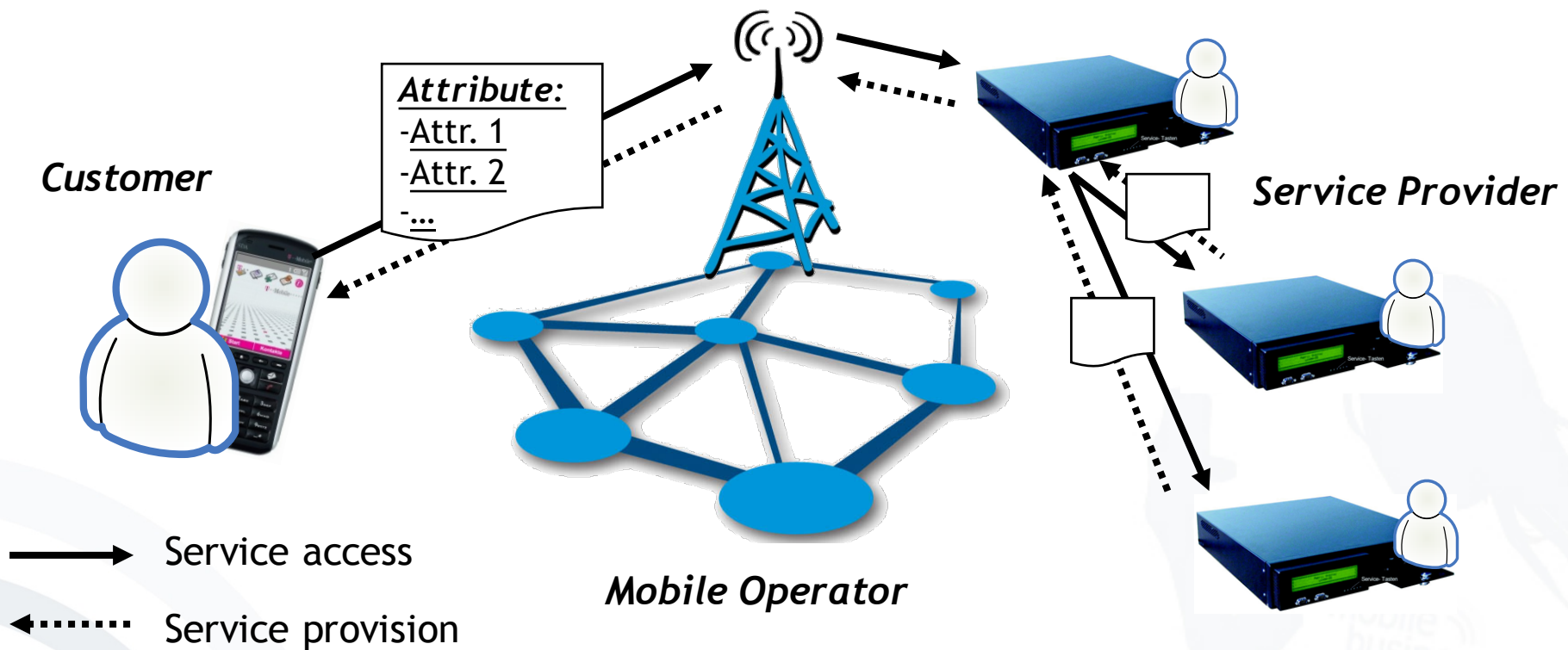
# Interdisciplinary Aspects Dimension: Technological



- Management of identities through the use of mobile devices
  - Management of social interactions in life, rather than Management of mobility
- Management of Mobile Identities
  - Usage of location data

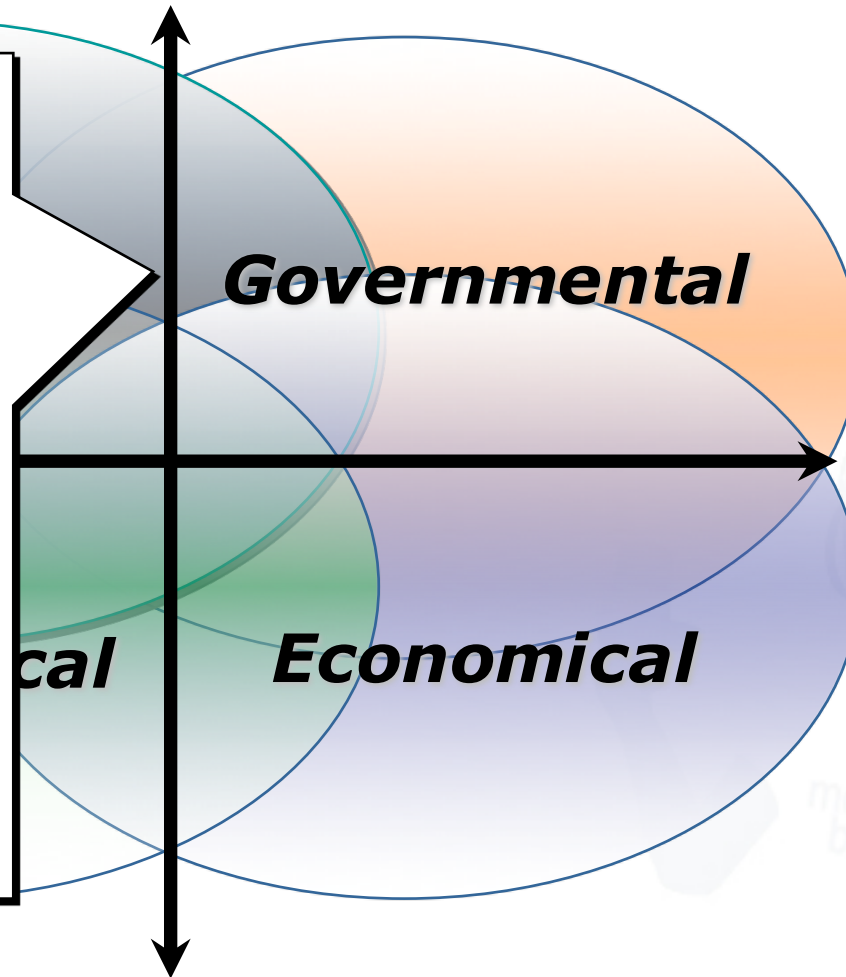


# Transfer of Attributes



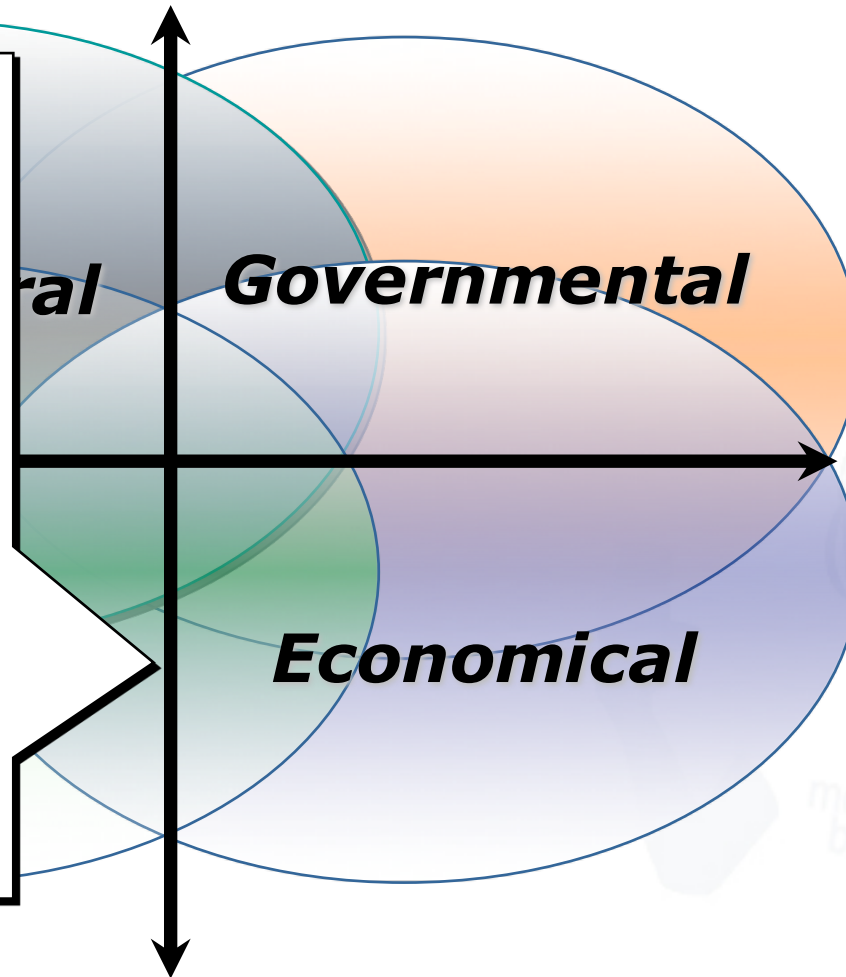
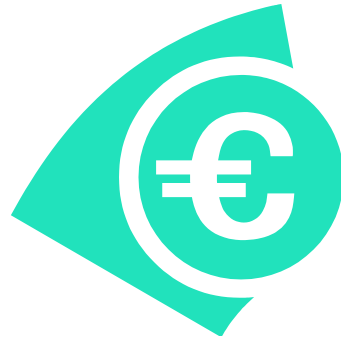
# Interdisciplinary Aspects Dimension: Governmental

- Laws
- Directives
- Regulations



# Interdisciplinary Aspects Dimension: Economical

- Costs and Benefits
- Technology Diffusion
- Return on Investment
- Business Value of IT
- Price of Convenience
- Technology Acceptance
- Business Models



- General success factors:
  - Locality principle
  - Reciprocity principle
  - Principle of understanding
- Protecting the privacy of a user:
  - User controlled linkage of personal data
  - Data minimisation
  - Awareness of data being disclosed
  - Sufficient usability towards the user



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