

Privacy vs. Data: Business Models in the digital, mobile Economy

Lecture 13
Research on Privacy, Identity
Management, and Mobile Business

SS 2015

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- Business Informatics / Information Systems Research
- ICT Research in Europe
- Prior and Current Research at M-Chair
- Future Research Directions

What is an Information System?

"A set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization."

Source: Laudon, Laudon (2010)

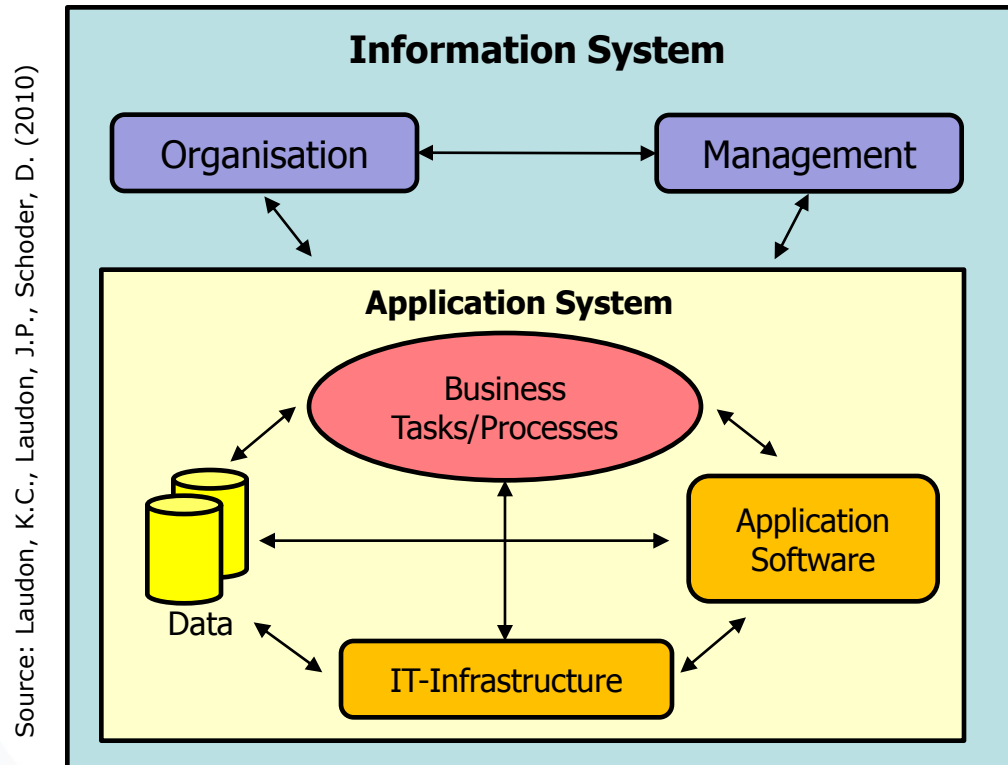


- **Information System (IS):**

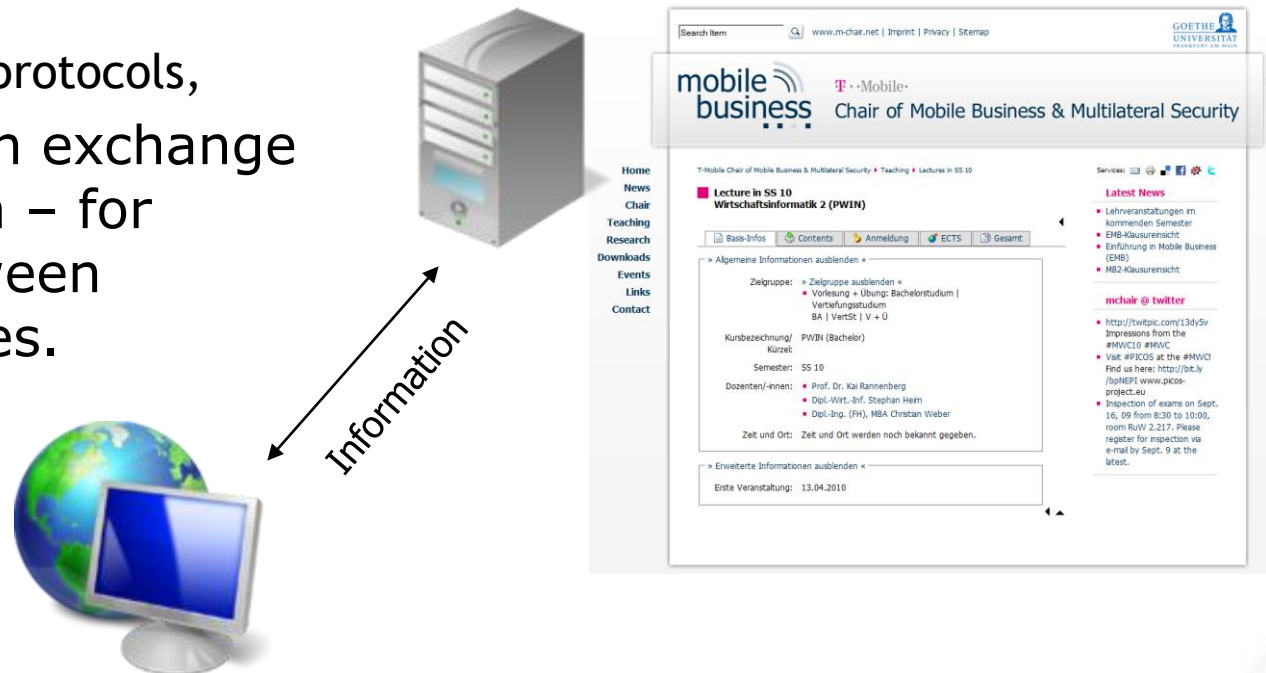
A system which was build to be used as part of an enterprise. It contains all relevant application systems and is embedded into the organisation and management of an enterprise.

- **Application System (AS):**

A system, which consists of business tasks and processes it supports, the underlying IT-infrastructure, the application software and the data it required in order to accomplish its objectives.



- A communication system is a collection of to each other compatible
 - Hardware (terminals, physical network components),
 - Software (operation systems, network protocols, application systems) and
 - Transmission protocols, which allow an exchange of information – for example between enterprise sites.



- Information Systems (organisational orientation)
 - Designed for an specific operational area of responsibility
 - Considers organisational and basic personal requirements
 - Supports decision making, coordination, controlling and monitoring in enterprises, but even more aids managers and employees to analyse problems, understand complex business cases and develop new products.

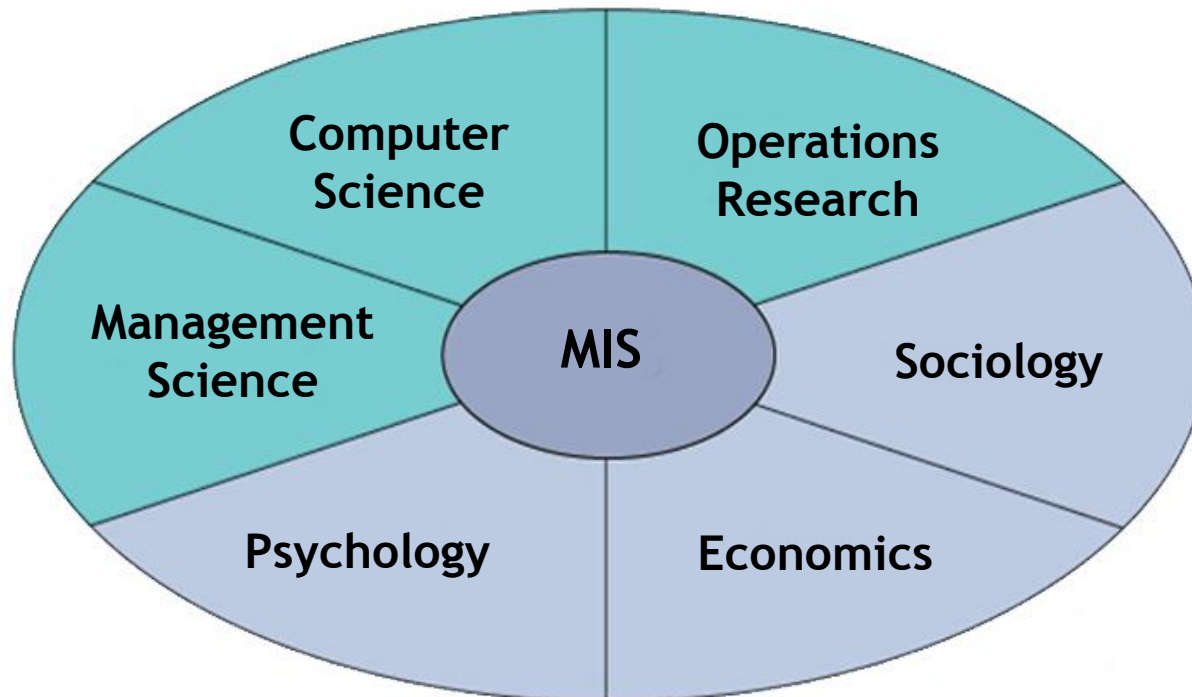
- Communication Systems (technical orientation)
 - Physical networking
 - Transmission media
 - Hardware and software

Generation of improved knowledge about ...

- Controlling the complexity of Information and Communication Systems
- Network and virtual markets
- User-Machine-Interfaces
- Information and Knowledge Management
- Architecture of Information Systems

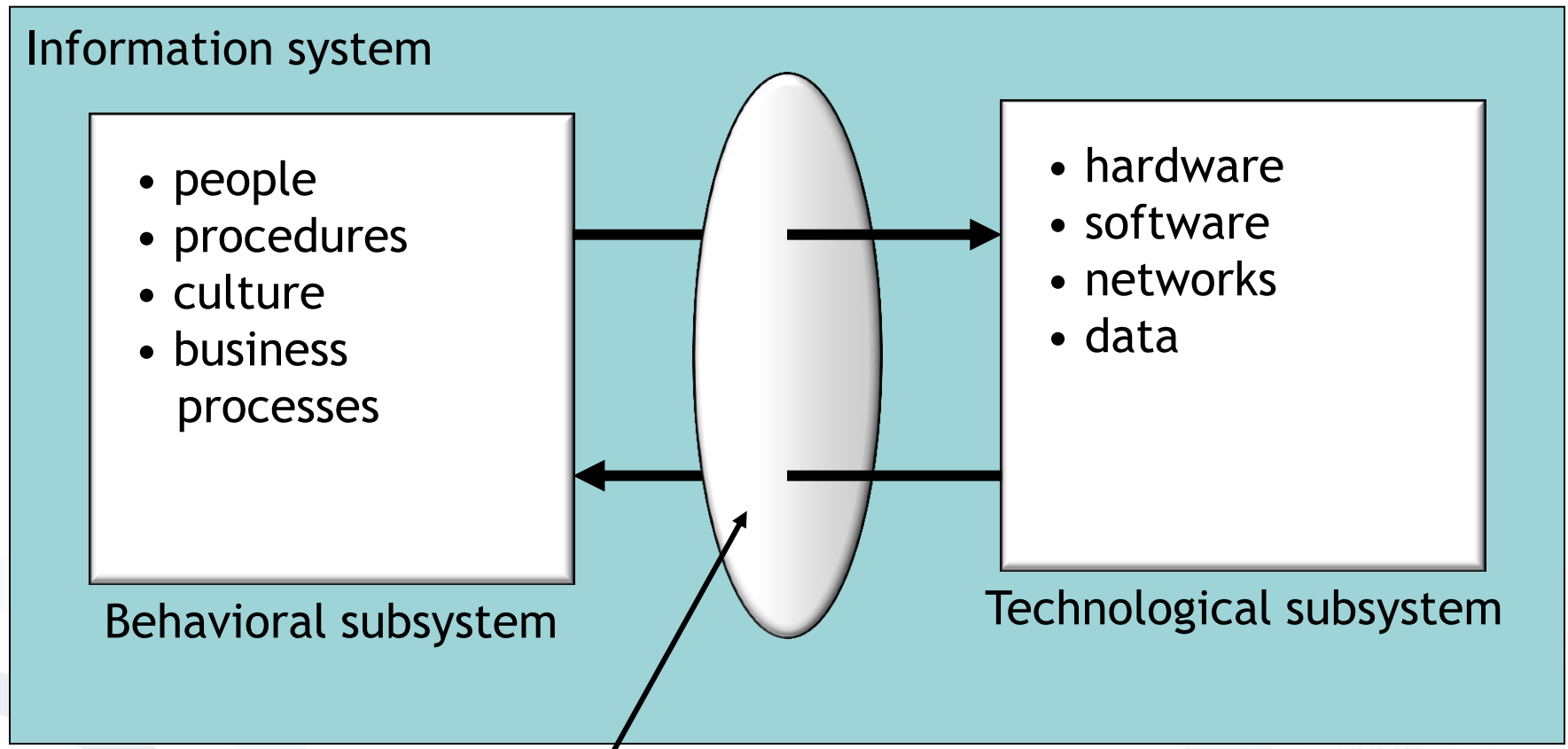
(Results taken from a Delphi study in 1999; Determination of central research objectives in the business informatics field within the next three and ten years)

Technical Approaches



Behavioral
Approaches

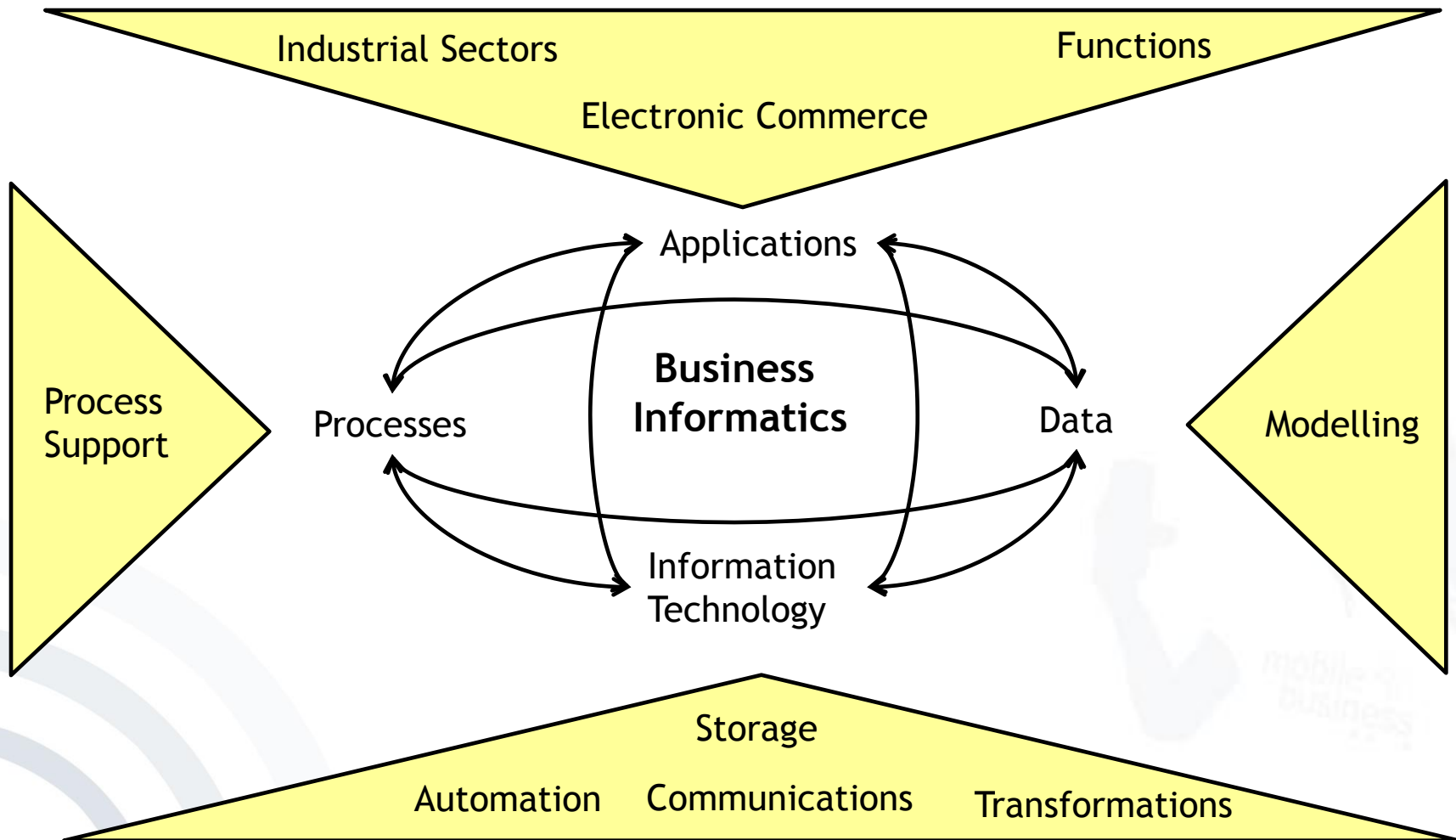
"Systems thinking" in IS Research



The emergent interactions between the behavioral subsystem and the technological subsystem

Source: Lee (2000)

Areas of Business Informatics



Source: Laudon, Laudon, Schoder (2006)

	Knowledge Objective	Design Objective
Methodological Assignment	Comprehension of methods and techniques of information systems design	Development of methods and techniques of information systems design
Content & functional- driven Assignment	Comprehension of information systems and their application fields	Provision of IS reference models for enterprises and industries

Source: Becker et al. (2001), S. 11; Laudon, Laudon, Schoder (2006), p. 45

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- One more thing ...

- *The overall aim of the Digital Agenda is to deliver sustainable economic and social benefits from a digital single market based on fast and ultra fast internet and interoperable applications.*
- The Digital Agenda for Europe is one of the seven flagship initiatives of the Europe 2020 Strategy, set out to define the key enabling role that the use of Information and Communication Technologies (ICT) will have to play if Europe wants to succeed in its ambitions for 2020.
- **Internet**
<http://ec.europa.eu/digital-agenda>, last accessed 2014-04-23.

- A vibrant digital single market
 - Opening up access to content
 - Making online and cross border transactions straightforward
 - Building digital confidence
 - Reinforcing the single market for telecommunications services

M-Chair

- Interoperability and standards
 - Improving ICT standard-setting
 - Promoting better use of standards
 - Enhancing interoperability through coordination
- Trust and security

M-Chair



- Fast and ultra fast internet access
 - Guarantee universal broadband coverage with increasing speeds
 - Foster the deployment of NGA networks
 - Open and neutral internet



- Research and innovation
 - Step up efforts and efficiency
 - Driving ICT innovation by exploiting the single market
 - Industry-led initiatives for open innovation

- Enhancing digital literacy, skills and inclusion
 - Digital literacy and skills
 - Inclusive digital services

- ICT-enabled benefits for EU society
 - ICT for environment
 - Sustainable healthcare and ICT-based support for dignified and independent living
 - Promoting cultural diversity and creative content
 - eGovernment
 - Intelligent Transport Systems for efficient transport and better mobility

- Business Informatics / Information Systems Research
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Concept and project objective(s)

- Address federation and interchangeability of technologies that support trustworthy yet privacy-preserving Attribute-based Credentials
- Define a common, unified architecture for ABC systems
- Provide an open reference implementations of the selected ABC systems and deploy them in actual production
- Support trustworthiness of eID deployments in Europe and enhance privacy protection techniques related to their deployment in practice.

ABC4Trust Consortium



TECHNISCHE
UNIVERSITÄT
DARMSTADT



MIRACLE



Söderhamm
Kommun



Microsoft



Project Pilots

✧ Swedish Secondary School:

- Privacy preserving communication platform

✧ University of Patras, Greece

- Electronic course rating while ensuring anonymity, single vote, and eligibility according to the number of attendance

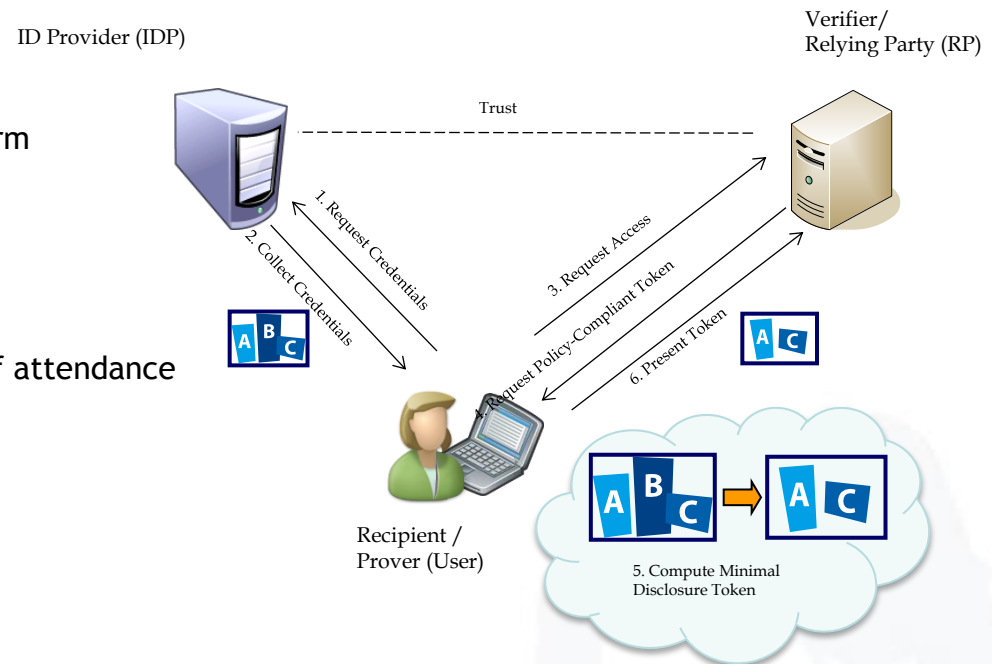
Underlying Technologies

✧ Microsoft U-Prove

✧ IBM Identity Mixer

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Project main outputs:

- A roadmap that will identify new research and technology development areas with the aim of contributing to the research and development priorities of FP 8 and of the Competitiveness and Innovation Program (CIP).
- A White Paper that will identify the domains for policy intervention in terms of regulation, legal measures, technology policy and institutional reorganization at EU, national and regional levels that may be necessary in order to enable and support the emergence of an operator-driven infrastructure for user-centric Identity management in the context of the envisioned INDI ecosystem.

Project Facts:

Duration: 24 months

Start Date: 2010-06-01

Partners: International Organisation for Knowledge Economy and Enterprise Development (IKED), Sweden; Fraunhofer Institut für Software- und System Technik (ISST), Germany; The Katholieke Universiteit Leuven, Belgium; Technische Universität Graz, Austria; Goethe Universität Frankfurt am Main, Germany; Government to You, Greece; NorthID Ltd, Finland



About:

GINI-SA project aims to investigate and set the foundations for the architectural, legal, regulatory requirements and the provisioning and privacy enhancing aspects of a framework of **user-centric identity management services**.

Project Vision:

Work towards the vision of a **Personal Identity Management environment**, where

- **individuals** will be able to **manage** their own **identity space** (Individual Digital Identity - INDI)
- **user-specific identity services** will be available in the INDI space with certain **privacy protection and privacy enhancement** provisions.





- Research on **mobile communities**
- How to improve **trust and privacy** in such communities?
- A set of interdisciplinary **requirements** for trustworthy, privacy-friendly community transactions
- Development of **concepts** to address the identified requirements



- Demonstrate the provision of state-of-the-art privacy and trust technology to community applications
- Develop **application prototypes** to demonstrate the use of PICOS concepts in practice

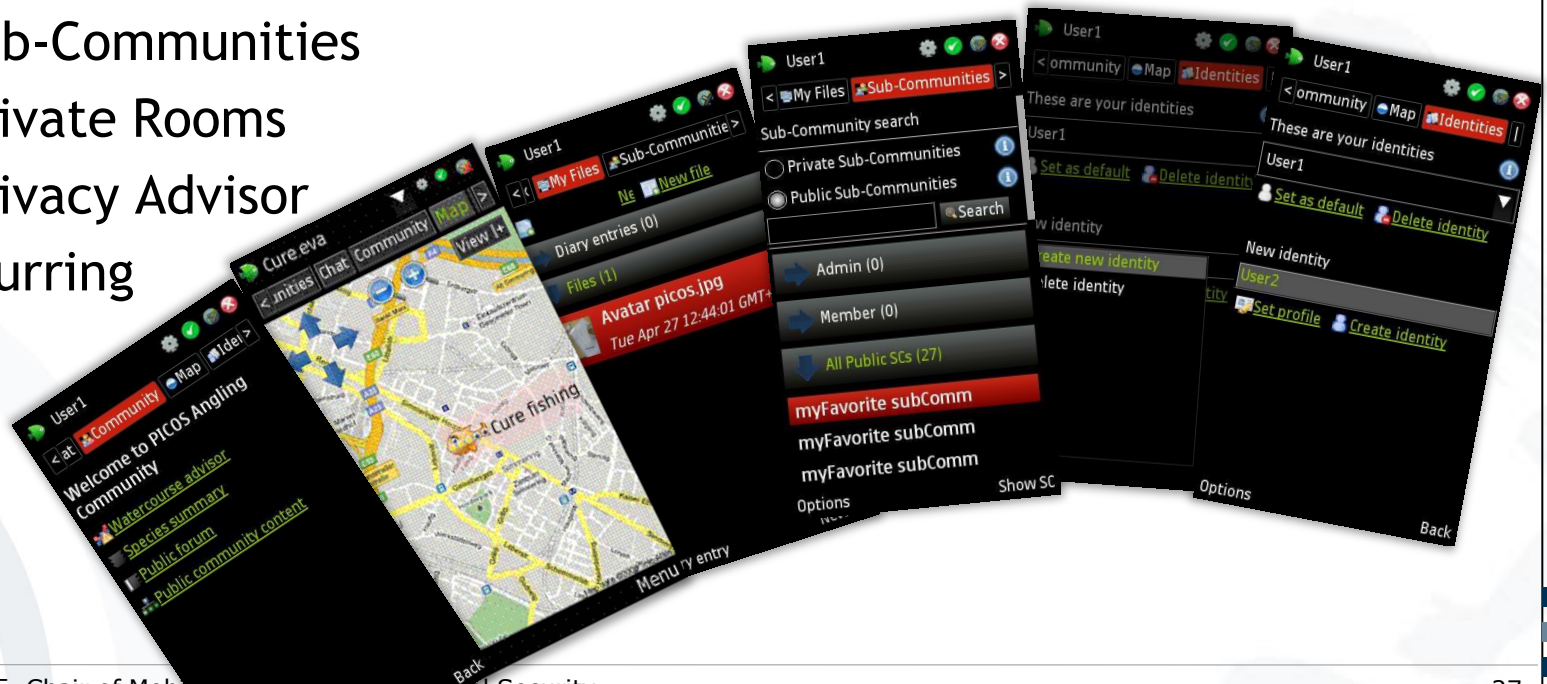
Exemplary Communities:

- Anglers
- Online Gamers
- Taxi Drivers

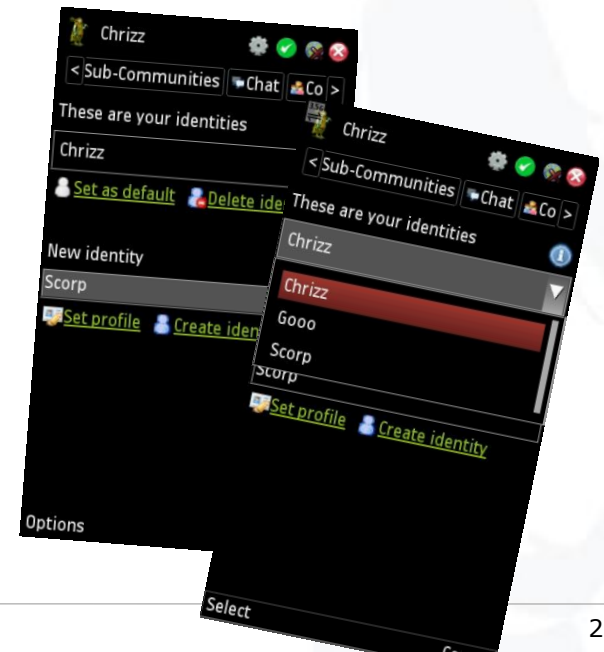


The Angler Community Prototype

- Prototypical implementation for trials
- Advanced privacy and identity management features optimized for mobile communities
 - Partial Identities
 - Sub-Communities
 - Private Rooms
 - Privacy Advisor
 - Blurring

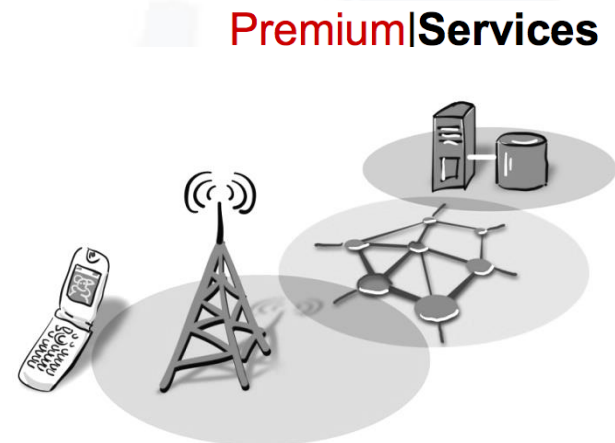
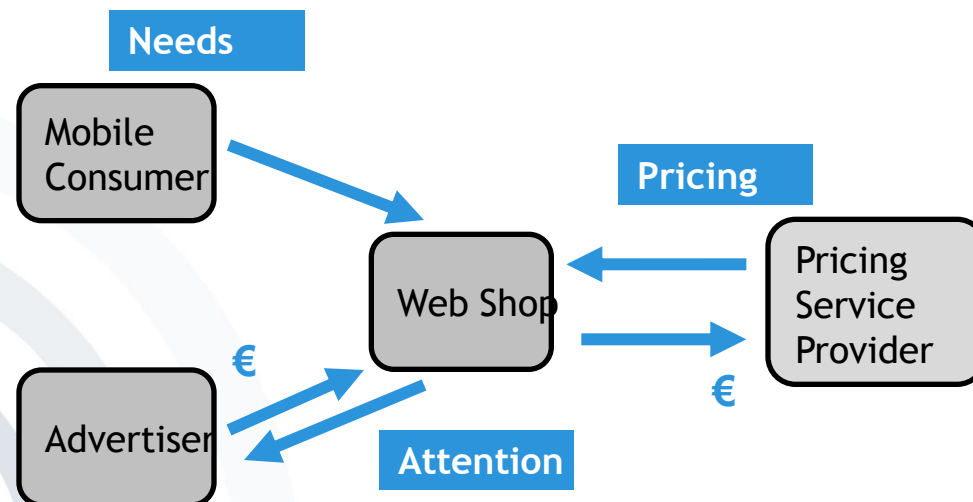


- Different Partial Identities for different **usage contexts**
 - e.g. for usage in different sub-communities to reflect various roles of users
- Limited set of personal information disclosed for each Partial Identity



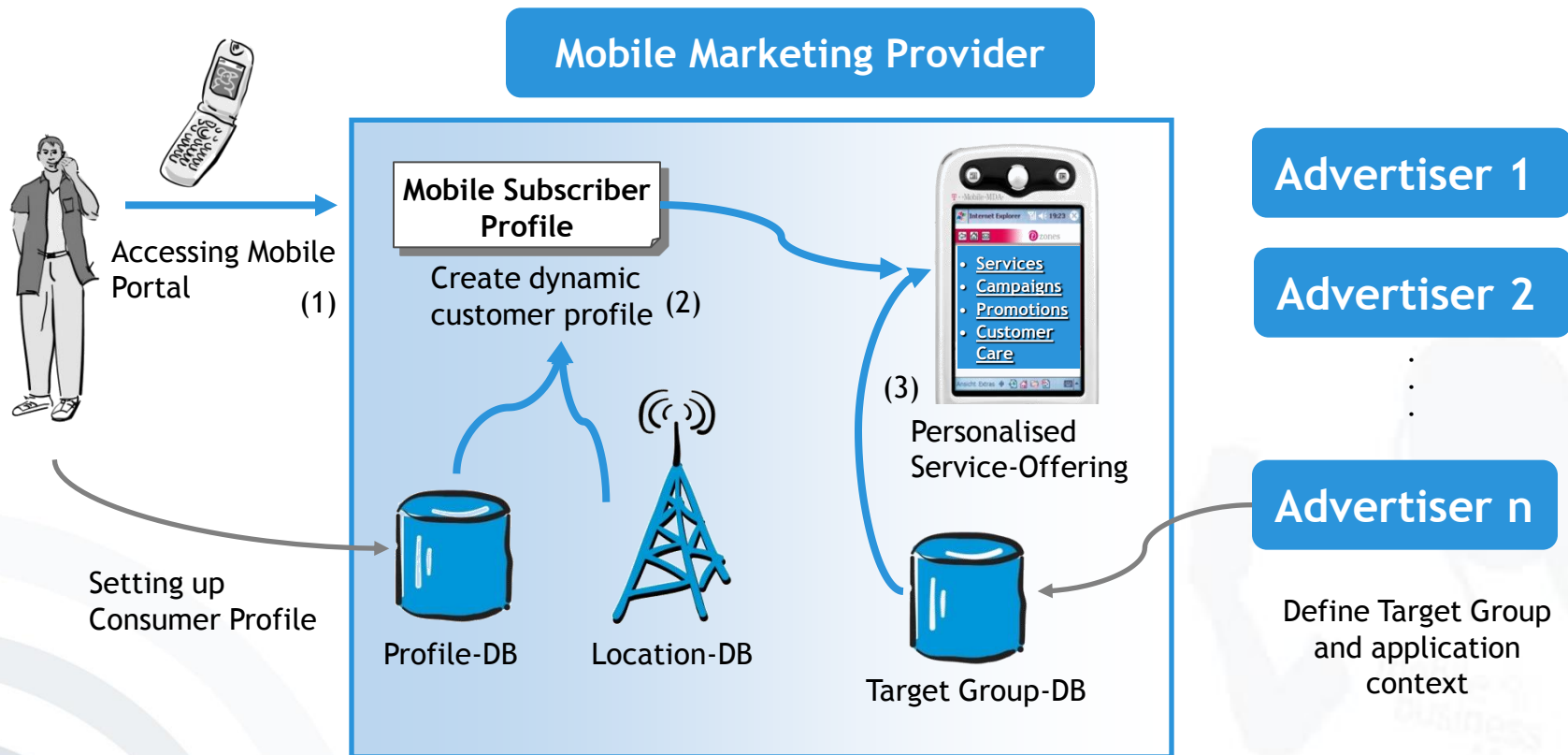
Research on Pricing Mechanisms for Context-sensitive Mobile Consumer Contacts offered to Mobile Advertisers

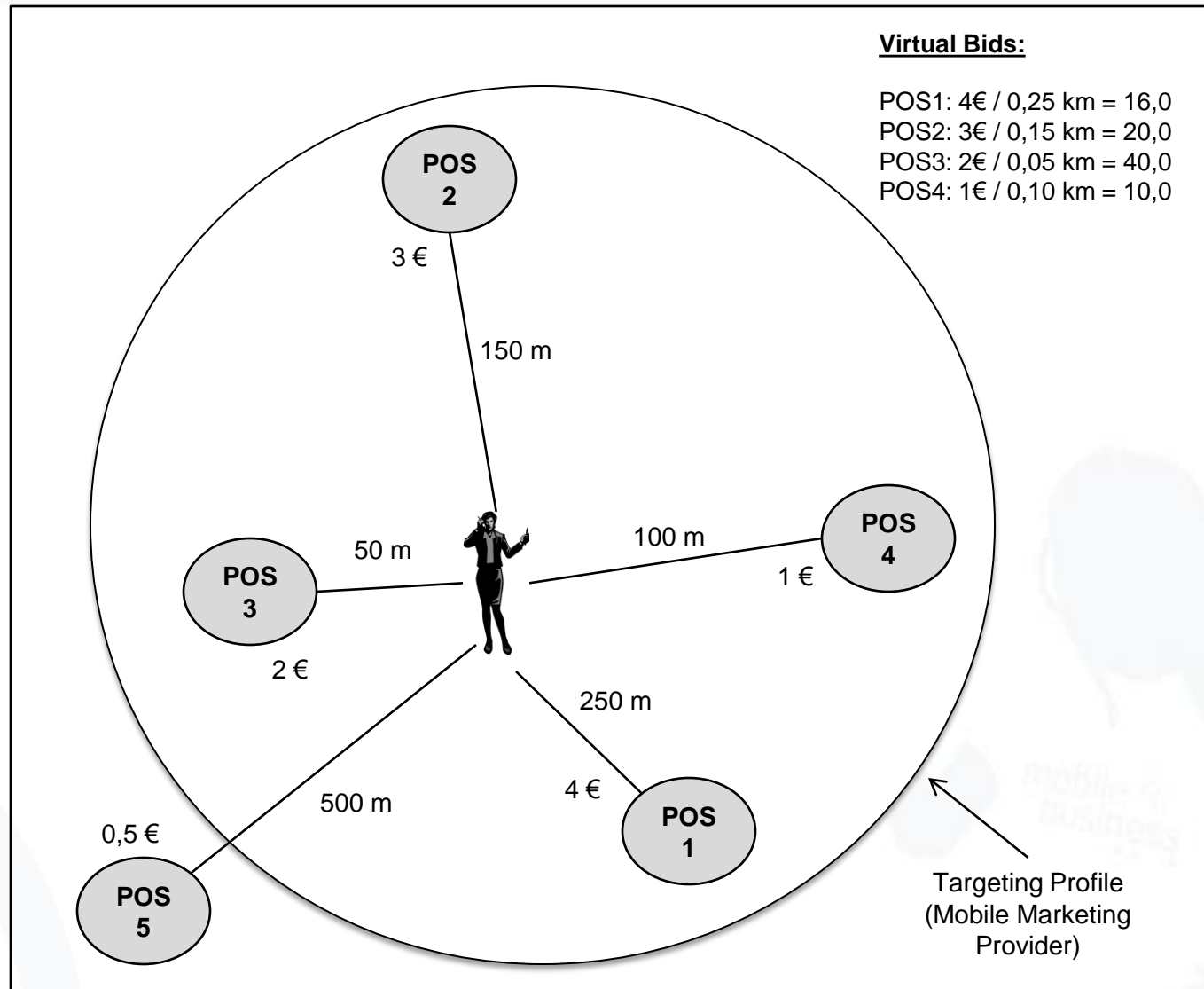
- Design of dynamic, interactive pricing mechanism to address the unique characteristics of Context-sensitive Mobile Consumer Contacts
- Development of an Evaluation Tool for Advertisers in order to determine the value of mobile consumers in their current usage situation
- Implementation of Pricing Service Platform for the webservice-based provision of Pricing Mechanisms to SMEs (e.g. Online Webshops)



PS Application Scenario

Scenario: Restaurant Finder, returning only restaurants in close distance with appropriate opening hours and matching a user's general interest profile.







Profile Management

User: Andreas

Pseudonym Name:

Phone #:

Gender: ☒ Male ☐ Female

Year of Birth:

General Interests: ☒ Books ☒ Cars ☒ Finance ☒ Movies ☒ Sports

Current Requests

- ☒ Bagel
- ☒ Burger
- ☒ Pasta
- ☒ Pizza
- ☒ Steak

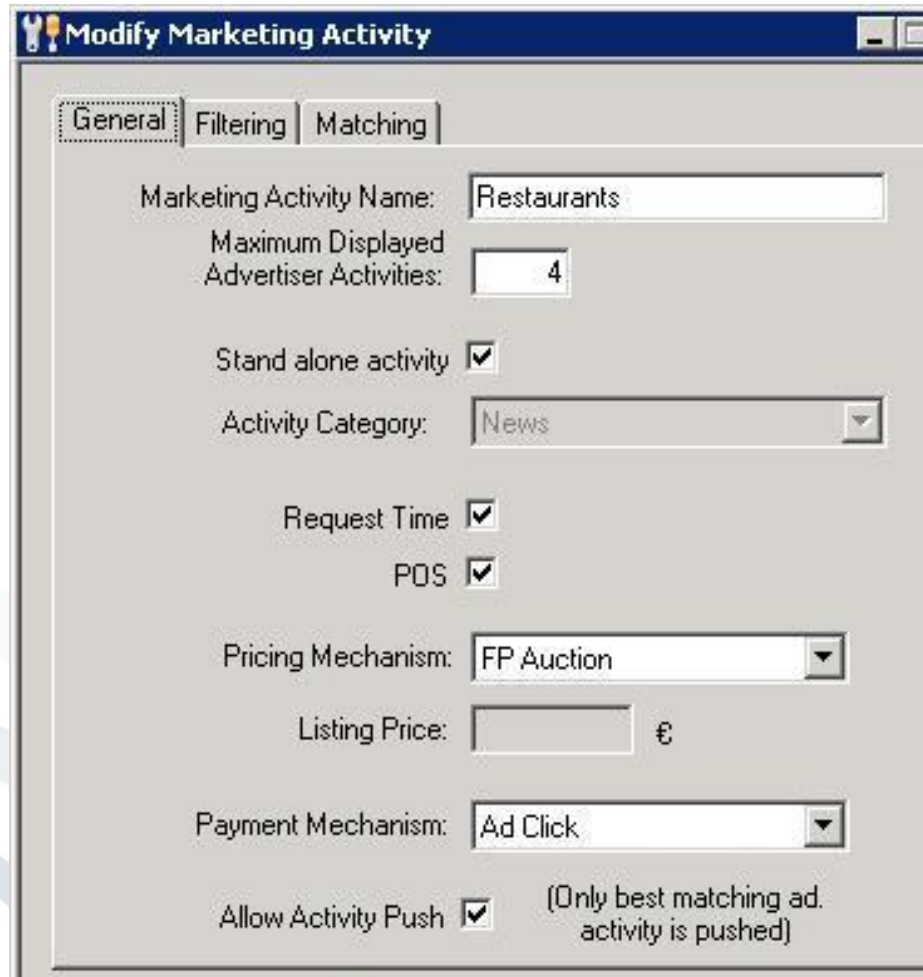
Privacy Settings

- ☒ Allow Push Activities
- ☒ Allow Localization
- ☒ Allow Identification
- ☒ Allow History
- ☒ Profile Activated

OK

Cancel

- Mobile Marketing Campaign Category Setup



The screenshot shows a 'Modify Marketing Activity' window with the following settings:

- General** (selected tab), Filtering, Matching
- Marketing Activity Name: Restaurants
- Maximum Displayed Advertiser Activities: 4
- Stand alone activity: ☒
- Activity Category: News
- Request Time: ☒
- POS: ☒
- Pricing Mechanism: FP Auction
- Listing Price: €
- Payment Mechanism: Ad Click
- Allow Activity Push: ☒ (Only best matching ad. activity is pushed)

- Target Group and Auction Process Configuration

Modify Marketing Activity

General **Filtering** Matching

Distance Filtering

☒ Distance Filtering

Max. Distance to POS: m

Proceed if missing:

Request Time Filtering

☒ Request Time Filtering

Request Time Start:

Request Time End:

Proceed if missing:

Modify Marketing Activity

General Filtering **Matching**

Distance Matching

$f(x,r) = x^{\hat{r}}$

☒ Distance Parameter (r):

Distance Weight:

Proceed if missing:

Attention Matching

☒ Attention Relevance

Attention Weight:

- Mobile Marketing Campaign Setup

The screenshot shows a web-based interface titled "Modify Advertiser Activity 'Hex-Mex'". It features four tabs: "Marketing Activity", "Advertiser Activity" (which is selected), "Consumer Profile", and "Filtering".

Under the "Advertiser Activity" tab, there are two main input fields:

- Advertiser Activity Name:** A text box containing "Hex-Mex".
- Advertisement Text:** A larger text box containing "Enjoy the best mexican food ever."

Below these fields, there are two sections for configuring the campaign:

- Opening Hours:** A section with a checkbox labeled "Set Opening Hours" which is checked. Below it are two time selection fields: "Time Start" set to "08:00:00" and "Time End" set to "22:00:00".
- Allow Activity Push:** A checkbox which is also checked.
- Budget per Consumer:** A field showing a value of "15" followed by a Euro symbol "€".

- Target Group and Auction Bidding Configuration

Modify Advertiser Activity 'Hex-Mex'

Marketing Activity | Advertiser Activity | Consumer Profile | **Filtering**

Distance Filtering

☒ Distance Filtering

Max. Distance to POS: m

Proceed if missing:

Request Time Filtering

☒ Request Time Filtering

Request Time Start:

Request Time End:

Proceed if missing:

Modify Advertiser Activity 'Hex-Mex'

Marketing Activity | Advertiser Activity | Consumer Profile | Filtering | **Matching**

Consumer Profile Matching

$f(x,r) = x^r$

☒ Profile Parameter (r):

Profile Weight:

Proceed if missing:

Location (POS Distance)

$f(x,r) = x^r$

☒ Distance Parameter (r):

Distance Weight:

Proceed if missing:

CoMPaS...
Context-sensitive Mobile Portal Service

Pseudonym: pantsoff.

Search & Find

[Pharmacies](#) [Restaurants](#)

Events ATMs

Content

[News](#) Brokerage

[Weather](#) Televis on

Pseudonym Selection:

Location: **frankfurt.**

CoMPaS...
Context-sensitive Mobile Portal Service

Restaurants

1. [Hex-Mex](#) (100%)
2. [Bagel](#) (28%)
[Guys](#)
3. [Pizza](#) (15%)
[People](#)
4. [Erwins](#) (14%)
[Finest](#)

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- Identity (Management)
 - is the digital clue between the building blocks of online / mobile businesses
 - of users is the fuel for online/mobile services and businesses, so enterprises in every digital ecosystem should aim at owning their own user base.
- Privacy ...
 - ... as fundamental building block for sustainable business
 - ... benefits cannot be directly/immediately perceived by individuals
 - ... protection lacks of incentives for enterprises and individuals
 - ... regulation can only offer a basic protection
- Mobile Business / Devices / ...
 -will most likely be at the centre of the future digital economy
 - ... are permanent companions of individuals while storing their digital identities
 - Digital identities as enabler for access to all communication and information in the digital economy

- Mobile Business
 - Major developments/business models often driven by the industry
→ Strong genuine incentive to innovate
 - So, many research efforts are solely dedicated towards understanding consumer behaviour and needs
- Identity Management
 - Identity Management as a Service in the Cloud
 - Continuous evolvement of Federated Identity Management
 - Standardisation of Identities and their Management
- Privacy
 - Research on tools/concepts to reduce the effort for users to protect their privacy (e.g. Facebook Privacy Advisor)
 - Research on how to establish privacy as a competitive edge for enterprises
 - Research on how to foster establishing Trust in the digital economy



- Laudon, K.C.; Laudon, J.P.; Schoder, D. (2006) „Wirtschaftsinformatik - Eine Einführung“.
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