Exercise 2

Business Informatics 2 (PWIN)

Information Systems II & III

WS 2019

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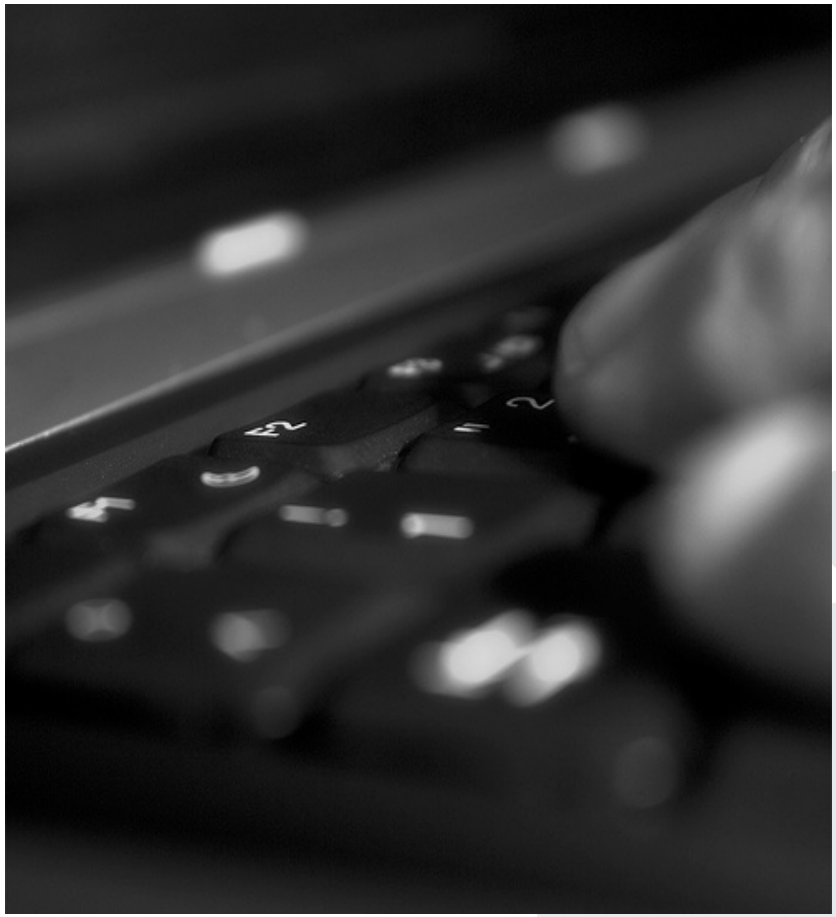

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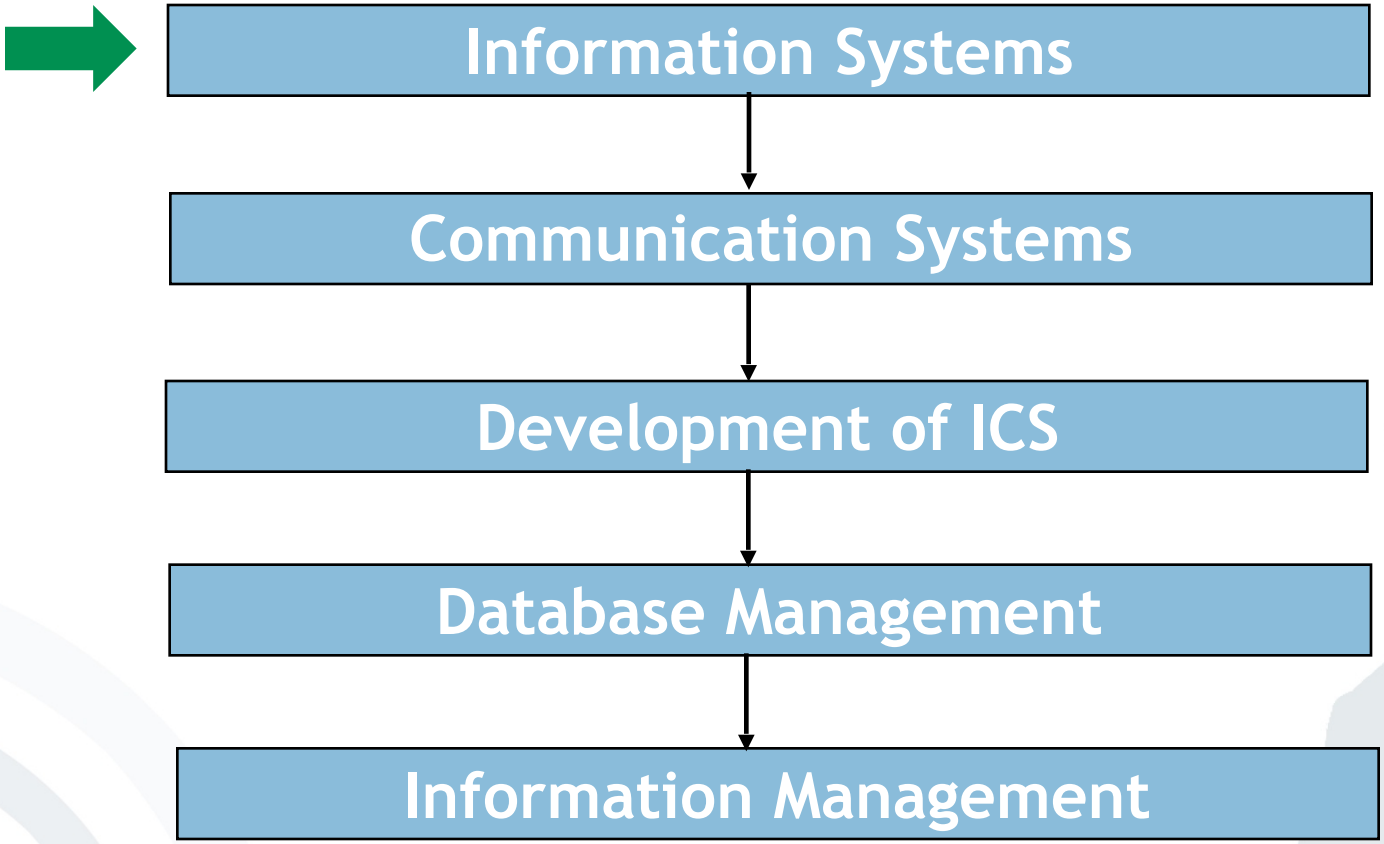
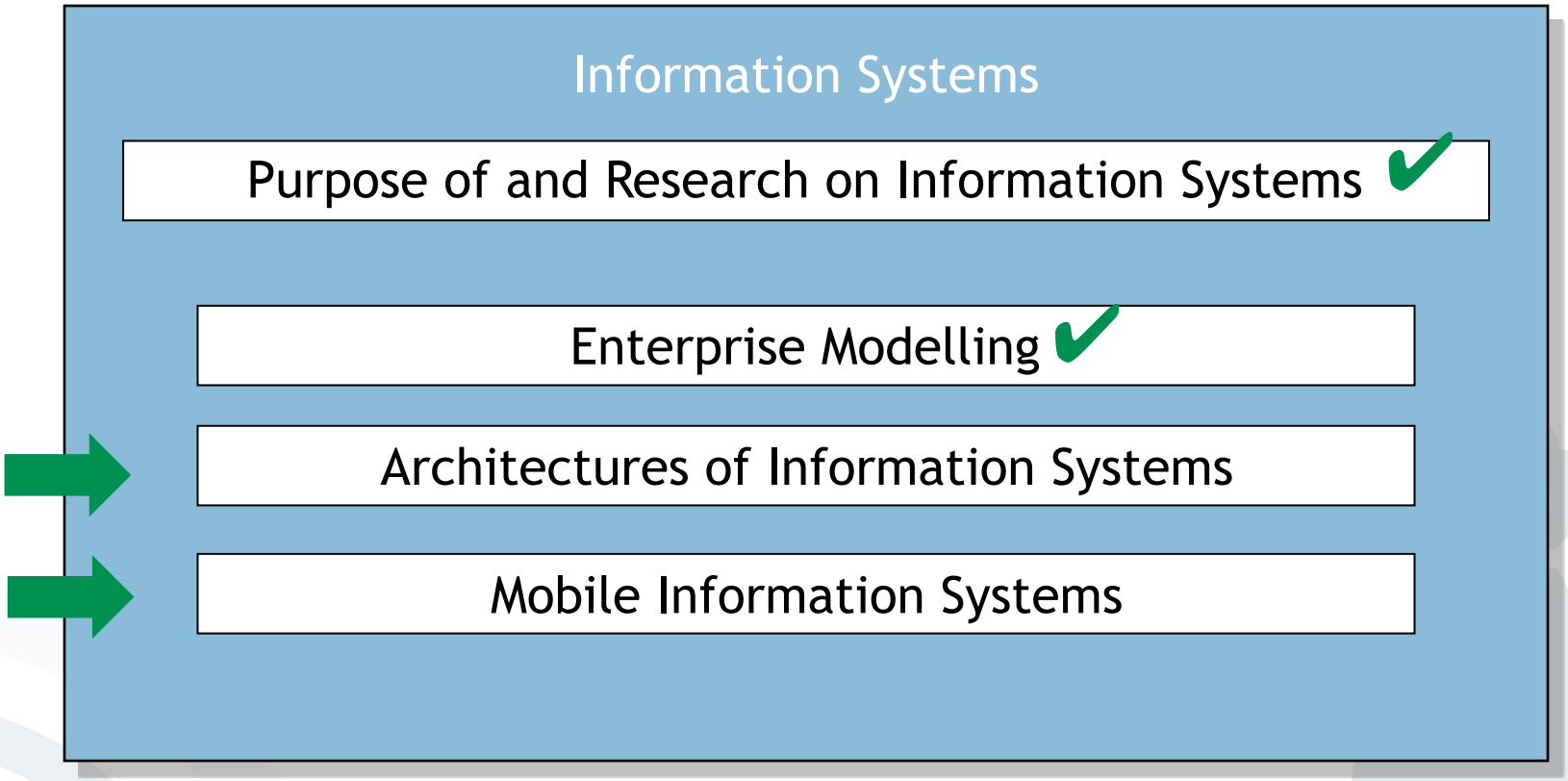
Components of the Course Business Informatics II (PWIN)



Components of the Course



Looking back at the Introduction and Information Systems I

By now you should be able to:

- Define an Information and Application System and explain the difference
- Know the difficulties that come with isolated systems and how they can be overcome
- Know what a model/enterprise model is and what abstracting mechanisms there exist
- Understand the basics of the ARIS model

→ Apply your knowledge!

Agenda

- Exercise 1: Models for the architecture of Information Systems
- Exercise 2: IS Architecture Concepts
- Exercise 3: Mobile Infrastructure and Ecosystem
- Exercise 4: Mobile Information Systems in general
- Exercise 5: Deep Dive – Platform Markets

Exercise 1: Architecture Models

a) Please sketch a three-tier and a model-view-controller concept and explain the function of each component.

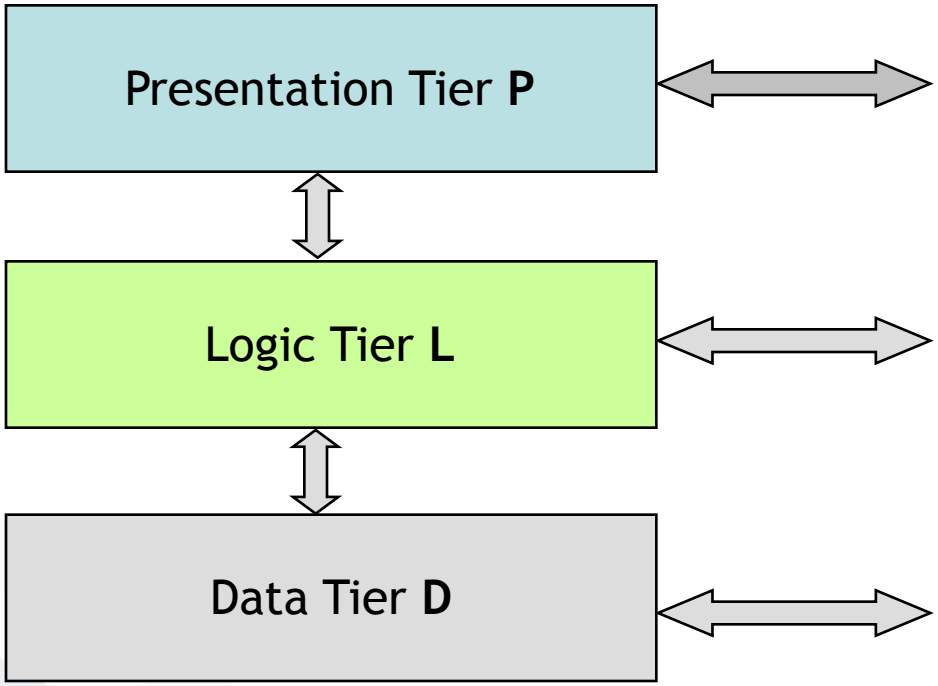
b) Please determine to which component the following InstaMatch elements belong in each concept:
   - The form for the input of personal information (e.g. gender, age, etc.) for users
   - The database for storing the contact list and calendar of a user
   - The software module containing the matching logic for the personal profiles of users.

Exercise 1: Architecture Models

a) Please sketch a three-tier and a model-view-controller concept and explain the function of each component.

Exercise 1: Architecture Models

Three-tier concept



Receives user input / display of data to the user (GUI)

GUI = Graphical user interface

Contains all the program logic

Stores and manage the data

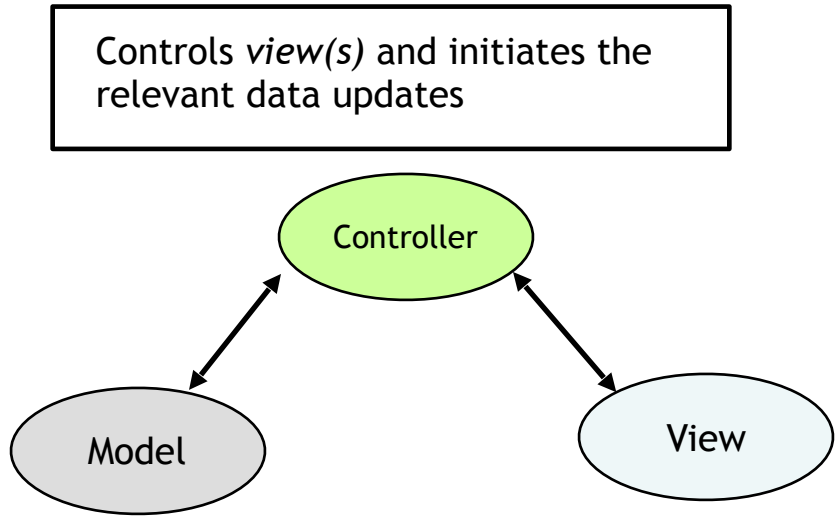
You will find this kind of architect-ture model in lecture 5, too.

Exercise 1: Architecture Models

Model-View-Controller concept

Memory aid

Digital order system at a restaurant



Exercise 1: Architecture Models

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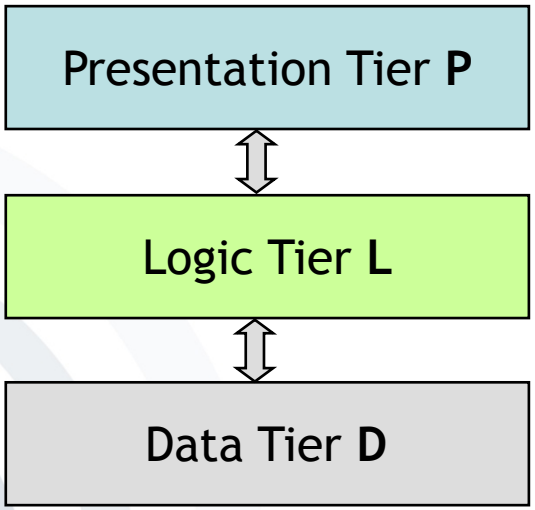
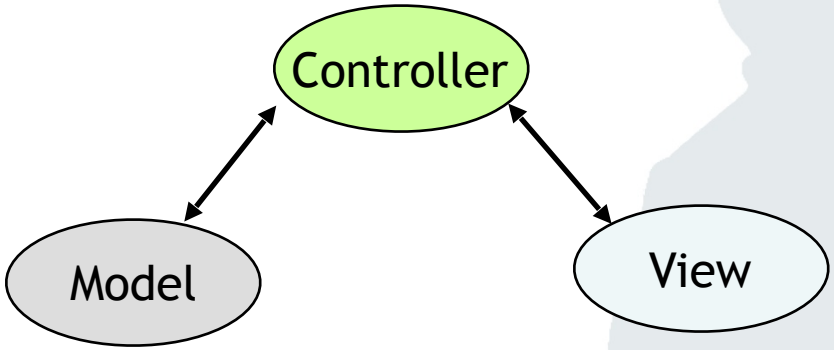
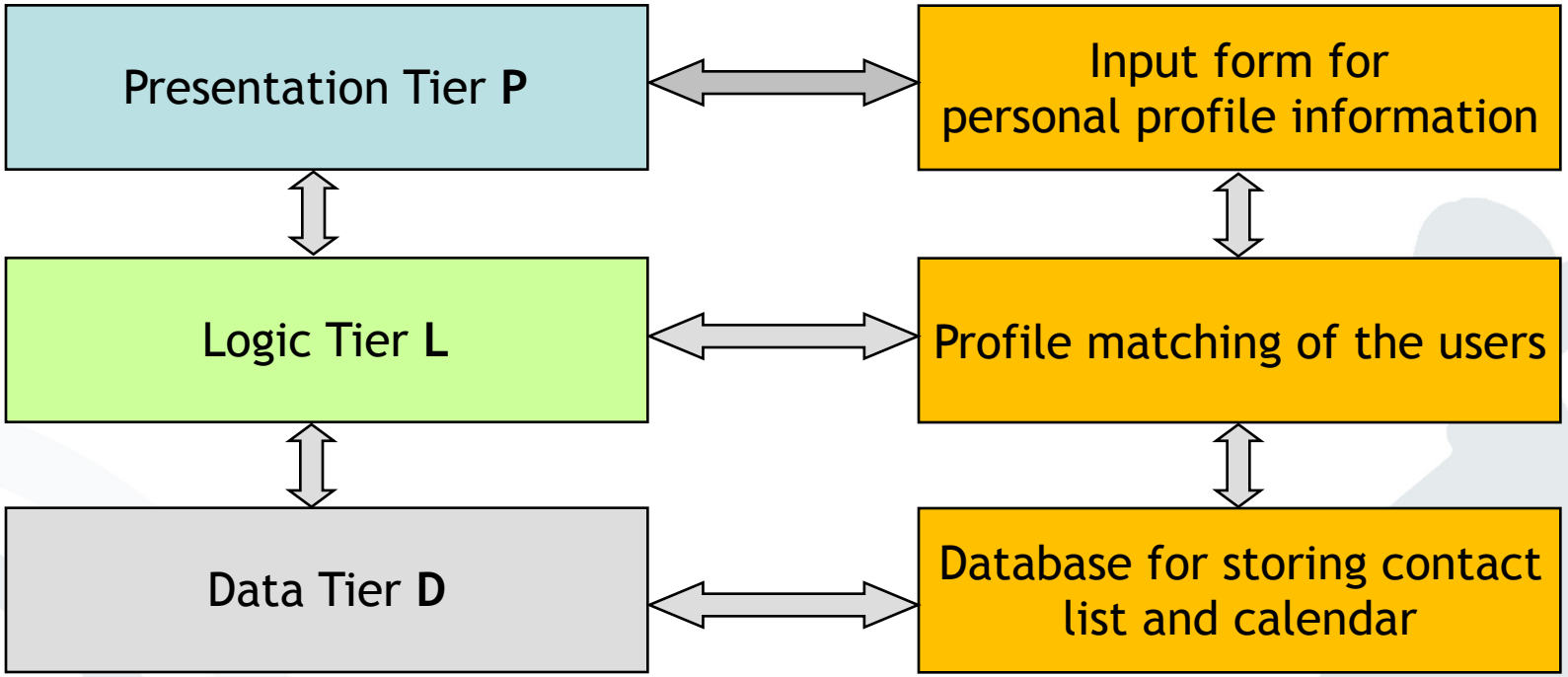




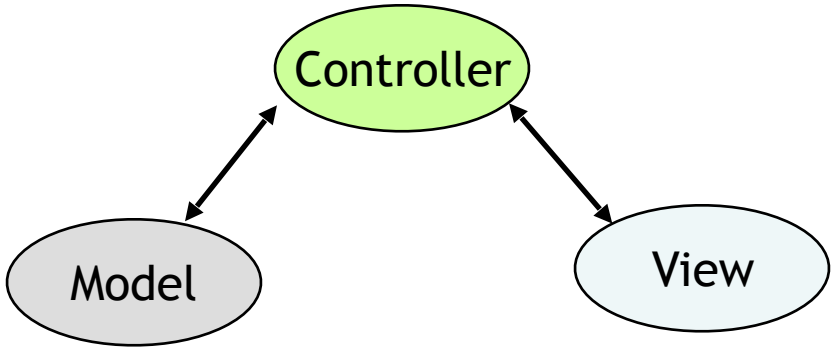
Exercise 1: Architecture Models

Three-tier concept



Exercise 1: Architecture Models

Model-View-Controller concept



Profile matching of the users

Database for storing contact list and calendar

Input form for personal profile information

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Architecture Concepts of Networked IS

- **Central Server Architecture**
  Low-feature terminals (receiver of services) attached to a powerful central computing unit (provider of services)
- **Client / Server Architecture**
  Network of computers, which can take the role of a server (provider of services), a client (receiver of services) or both.
- **Peer-to-Peer Architecture**
  Network of computers holding equal rights (provider / receiver of services)

- **Cloud Computing Architecture**
  Network of computers in the role of a client (receiver of services) connected to a "cloud" of computers (provider of services), which act as a single central server

internetbasiert

- **Edge Computing Architecture**
  Leverages network resources to optimise cloud computing systems by performing data processing at the edge of the network, near the data source

Exercise 2: Cloud & Edge

a) What are the advantages and disadvantages of a Cloud Computing architecture in comparison to a central server concept?

b) What kind of Cloud Computing services do there exist? Assuming the Cloud Computing concept is suitable for the InstaMatch service, what type of Cloud service (e.g. infrastructure as a service) should be booked and why?

c) Briefly explain the concept of Edge Computing Architecture and why it is gaining importance.

Cloud Computing Architecture

https://www.youtube.com/watch?v=1ERdeg8Sfv4

Exercise 2: Cloud & Edge

a) What are the advantages and disadvantages of a Cloud Computing architecture in comparison to a central server concept?

Exercise 2: Cloud & Edge

- Advantages
  - Information system become highly scalable
  - Central data storage and backup
  - Cost efficient (one has only to pay for the actually used computing power and time)
  - Anytime & anywhere access to applications and data
  - Allows to run sophisticated applications on low-powered systems (e.g. Google's mobile voice recognition on Android devices)

- Disadvantages
  - Enterprises or end users have to rely on the cloud service provider
  - Potential threats
    - Data security, data privacy
    - Provider bankruptcy, lock-in effects
    - Internet connection failures

Exercise 2: Cloud & Edge

- Cloud Computing:
  - Abstracts from underlying IT-infrastructures (Computing power, storage, services, etc.) for its customers
  - Allows customers the dynamic allocation of required IT-resources on demand
  - Pricing based on consumed IT-resources
- Central Server:
  - Allocation of IT-resources based on the actual hardware/ software. For instance, single server units (3 GHz Processor, 16 GB RAM, 1 TB hard disk)
  - Pricing based on actual hardware/software

Exercise 2: Cloud & Edge

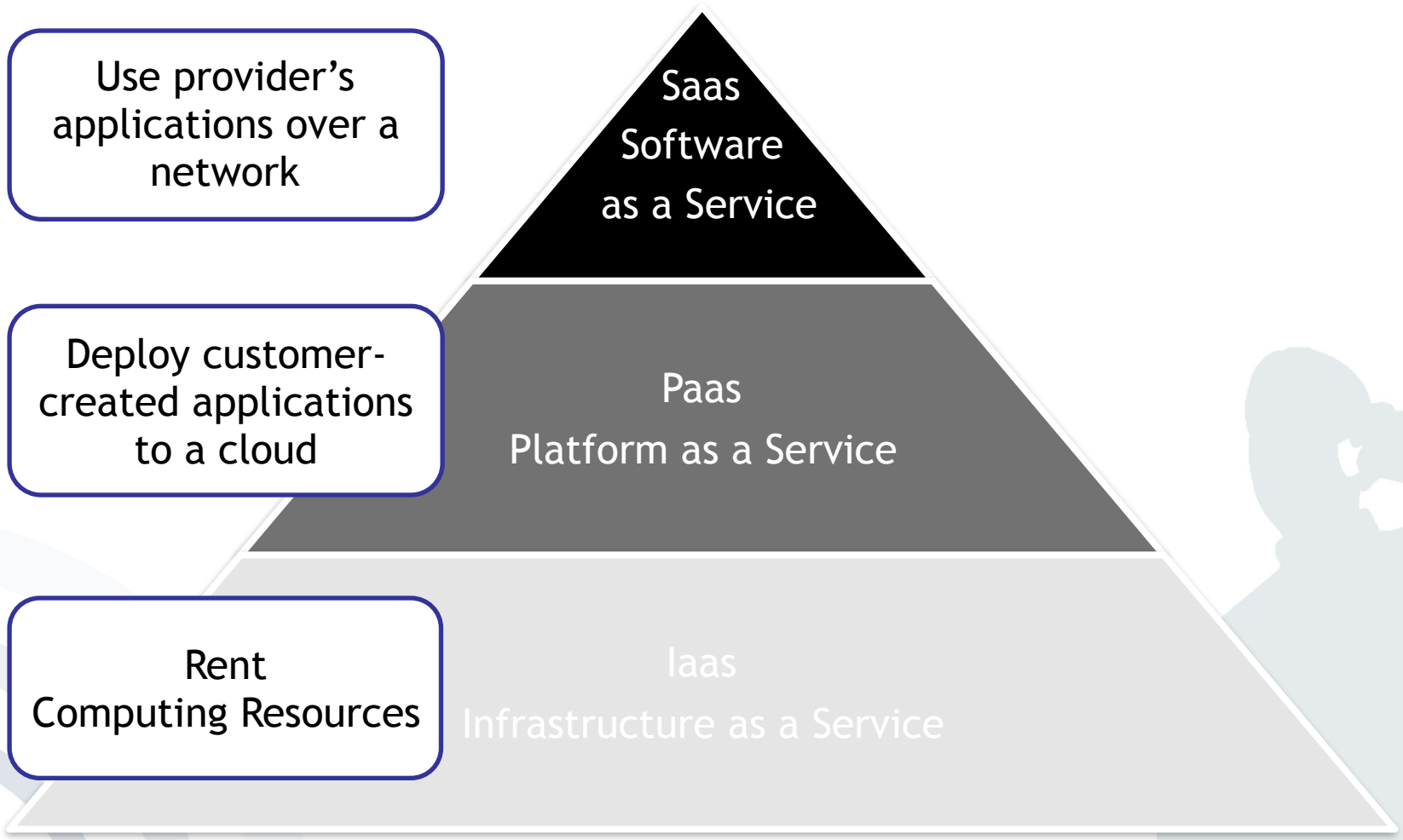
b) What kind of Cloud Computing services do there exist? Assuming the Cloud Computing concept is suitable for the InstaMatch service, what type of Cloud service (e.g. infrastructure as a service) should be booked and why?

Exercise 2: Cloud & Edge

Use provider's applications over a network

Deploy customer-created applications to a cloud

Rent Computing Resources



Exercise 2: Cloud & Edge

All three types of Cloud Services are possible. Decision depends on planned InstaMatch architecture.

- Infrastructure as a Service
  - Only the IT-infrastructure is provided by the cloud
  - The InstaMatch provider needs to install its own *platform* and subsequently build its service upon it
- Platform as a Service
  - The cloud provides the infrastructure and operating system.
  - The InstaMatch Provider can install the application on this platform (e.g. web-based application)
- Software as a Service
  - The cloud provides software functionality as a service which can be accessed through Application Programming Interfaces (APIs) via the Internet
  - The InstaMatch provider can run its application via the Web and allow users to use it without any prior downloads or installations

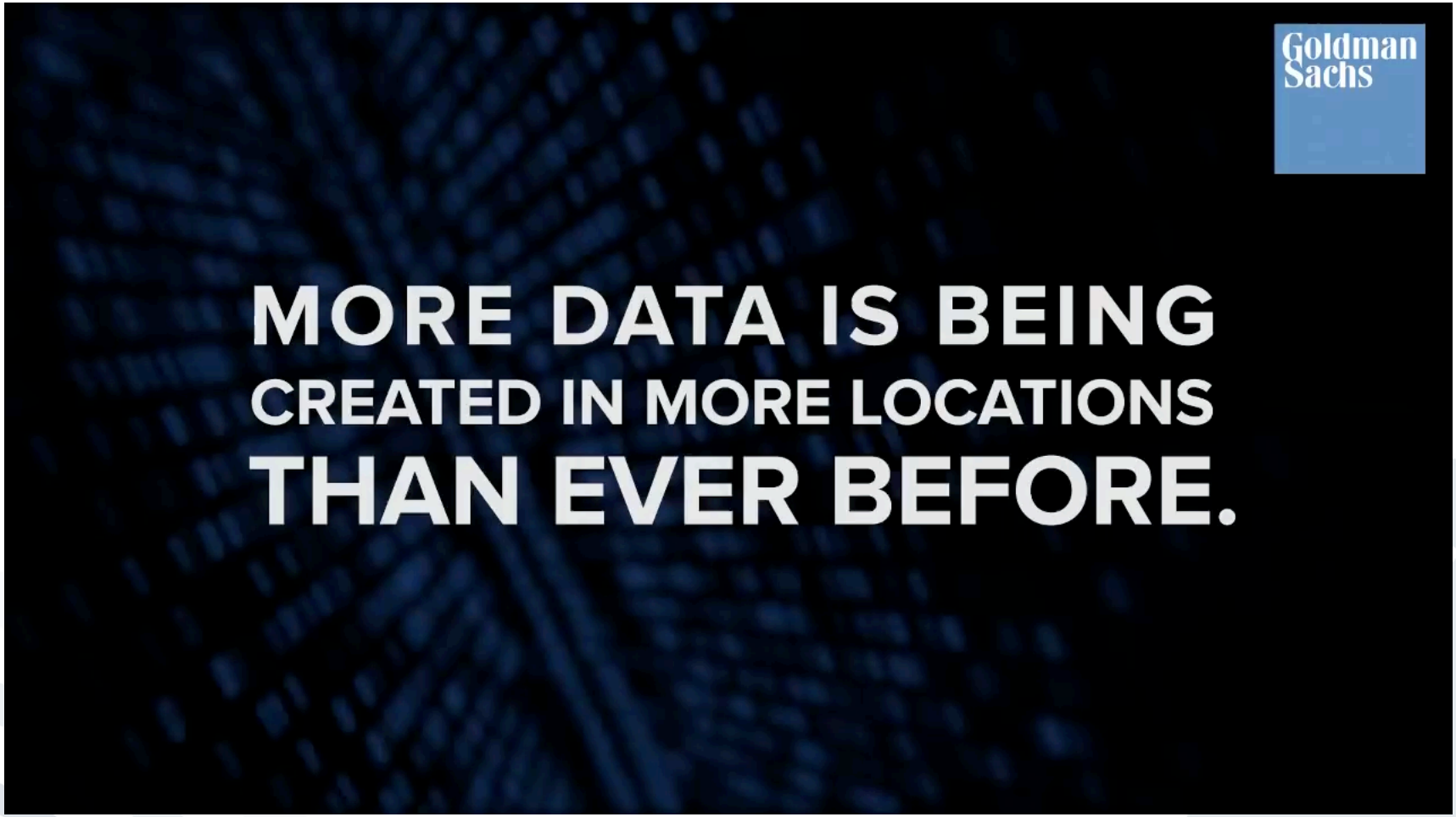
Exercise 2: Cloud & Edge

Features	Iaas	PaaS	SaaS
What you get	You get the infrastructure & pay accordingly .Freedom to use or install any OS, software or composition	Here you get what you demand. Software, hardware, OS, web environment. You get the platform to use & pay accordingly	Here you don't have to worry about anything. A pre-installed, pre-configured package as per your requirement is given and you only need to pay accordingly.
Importance	The basic layer of Computing	Top of IaaS	It is like a Complete package of services
Technical Difficulties	Technical knowledge required	You get the Basic setup but still the knowledge of subject is required.	No need to worry about technicalities. The SaaS provider company handles everything.
Deals with	Virtual Machines, Storage (Hard Disks), Servers, Network, Load Balancers etc	Runtimes (like java runtimes), Databases (like mySql, Oracle), Web Servers (tomcat etc)	Applications like email (Gmail, Yahoo mail etc), Social Networking sites (Facebook etc)
Popularity Graph	Popular among highly skilled developers, researchers who require custom configuration as per their requirement or field of research.	Most popular among developers as they can focus on the development of their apps or scripts. They don't have to worry about traffic load or server management etc.	Most popular among normal consumers or companies which reply on softwares such as email, file sharing, social networking as they don't have to worry about the technicalities.

Exercise 2: Cloud & Edge

c) Briefly explain the concept of Edge Computing Architecture and why it is gaining importance.

Exercise 2: Cloud & Edge



https://www.youtube.com/watch?v=DDvMkgEoHxQ

Exercise 2: Cloud & Edge

Edge Computing Architecture

Pushing "intelligence" to the edge of the network

- Why edge computing?
  - Proliferation of IoT devices producing data to be processed
  - Limitations due to centralized nature of cloud architectures
  - Clouds' quality of service impacted by distance to data center
  - Steady decline in the cost of processing power & appearance of intelligent endpoint devices that sense and can make inferences

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Exercise 3: Types of Apps

a) What types of apps do there exist and what is the difference between them?

b) Which type is best suited for the InstaMatch service and why?

c) If InstaMatch chooses to use a mobile web app, how would the presentation, logic and data tier be distributed among the user and provider in the InstaMatch app? How would it be in an web app?

Exercise 3: Types of Apps

a) What types of apps do there exist and what is the difference between them?

Picutre: https://www.turtle-media.com/blog/2012/07/14/native-app-vs-web-app-why-hong-kong-mostly-gets-it-wrong/

Exercise 3: Types of Apps

Mobile app ("native App")	Mobile web app
Supports offline use	Needs constant internet connectivity (network coverage)
Can be found easily in app store(s)	Distribution via URL, e.g. QR-codes
Business model: Sold in app store(s)	Difficult to implement payment and authentication system
Can make use of all OS and device functions	Cannot access OS core functions (e.g. 3D graphic processing or access to locally protected storage)
Needs to be platform-specific (native code)	Using web browser of the device, hence manufacturer-independent multi-platform support possible; also porting to other devices/platforms is less expensive
Based on Objective-C, C#.Net, Java	Based on HTML5, CSS, Javascript
Updates/versioning through app stores	Easy updates as they are done on the server, not on every client device

Exercise 3: Types of Apps

b) Which type is best suited for the InstaMatch service and why?

Exercise 3: Types of Apps

Because of its convenience for users and mobile specific features (e.g. access to location, but also handling of payments) a native mobile app is most suitable for InstaMatch.

Exercise 3: Types of Apps

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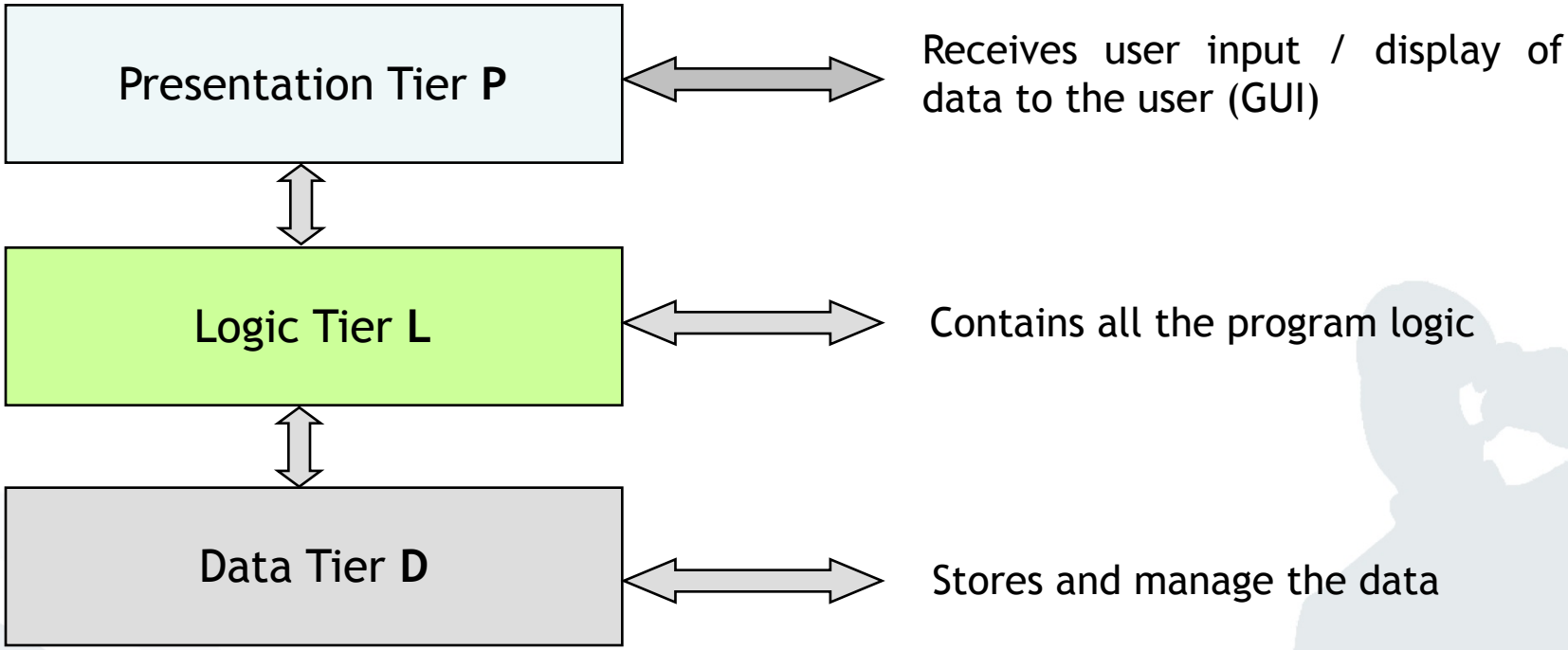
Exercise 3: Types of Apps

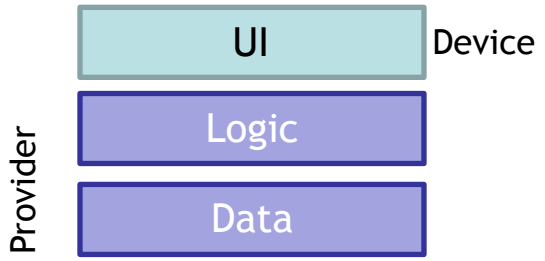
Three-tier Concept



Exercise 3: Types of Apps

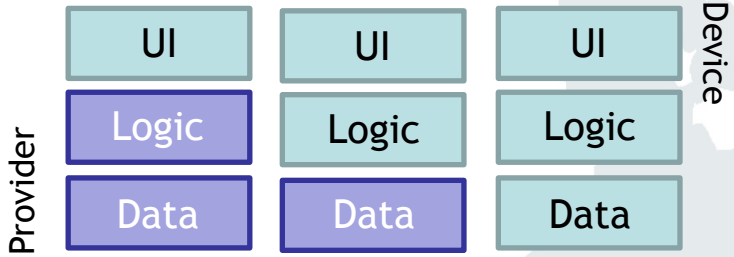
Mobile Web App

- App not installed on the device – UI runs in web browser
- Data & Logic of App runs at Provider



Mobile App ("Native App")

- App is downloaded and installed
- Data & Logic on device (and/or in the cloud)



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Exercise 4: Mobile IS

a) Name three particularities of mobile devices that make them attractive for Marketers.

b) What is contextual targeting? Please give an example?

Exercise 4: Mobile IS

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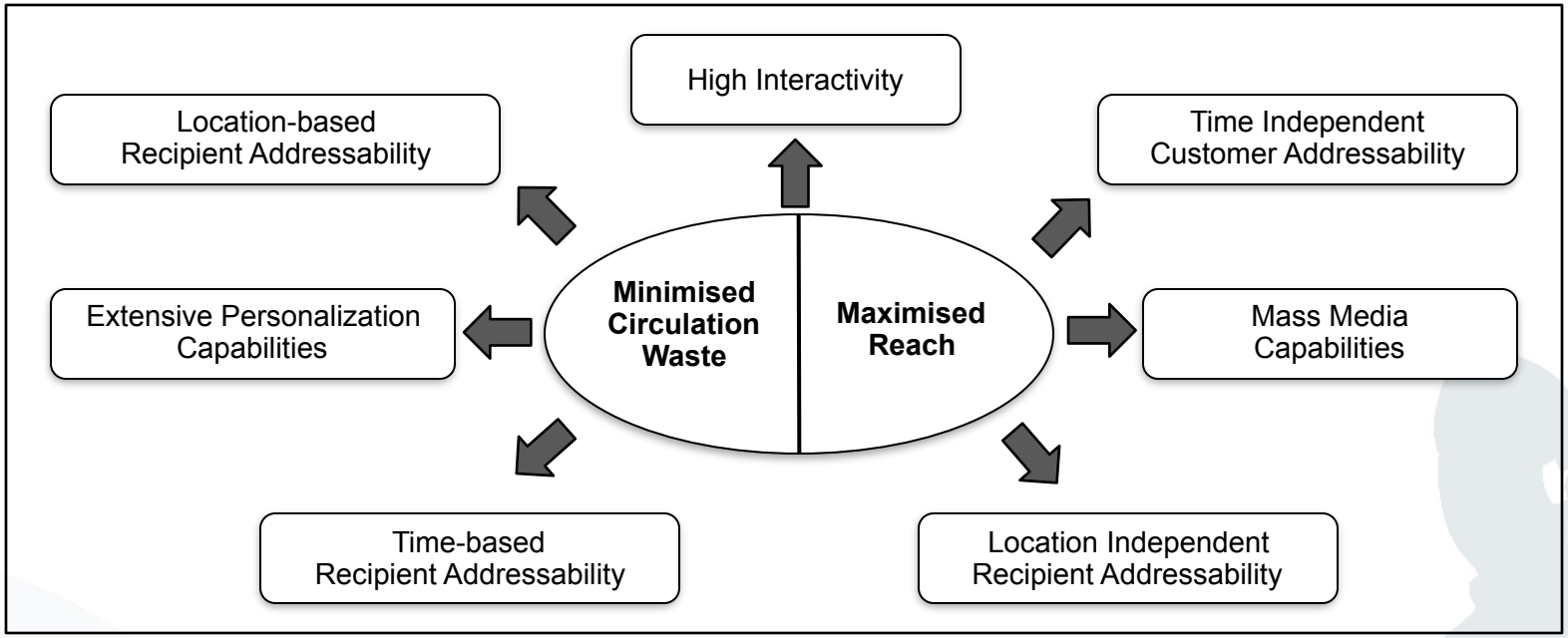
Exercise 4: Mobile IS



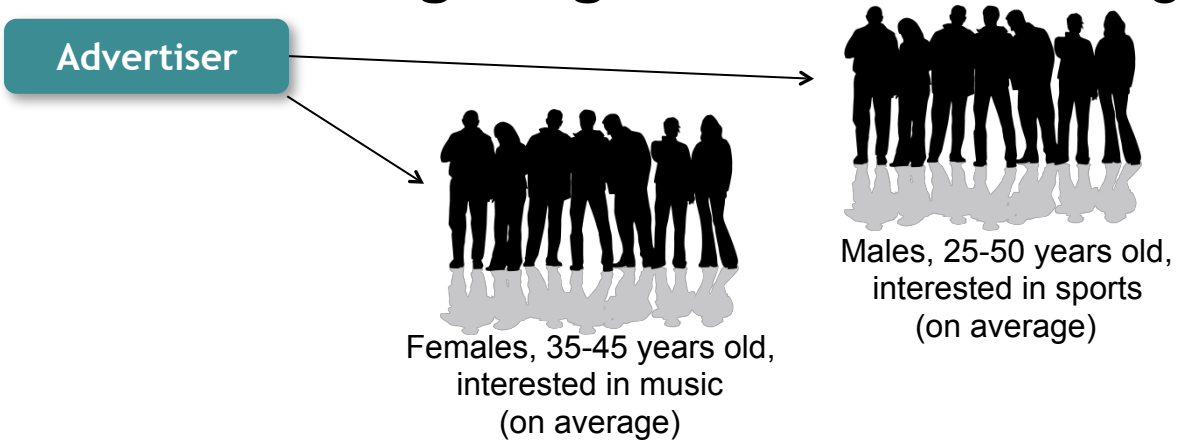
Theoretical Potential of Mobile Marketing

Exercise 4: Mobile IS

b) What is contextual targeting? How is it related to InstaMatch?

Exercise 4: Mobile IS

Traditional targeting of mobile marketing campaigns



Traditional Information
- Implicit information about preferences of mobile users
- Typically acquired without mobile user's knowledge

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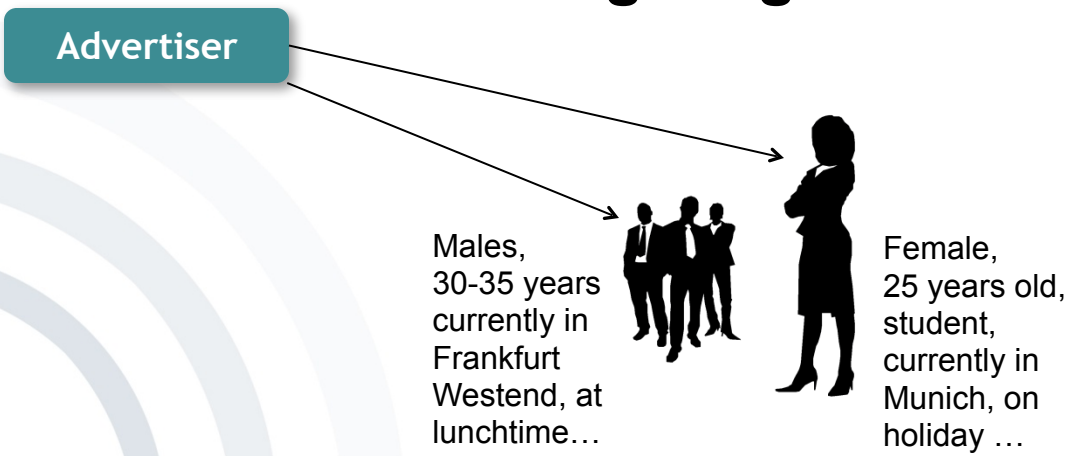
Context-sensitive targeting of mobile marketing campaigns



Context Information
- Explicit information about the usage situation of mobile users
- To be actively disclosed by mobile users

Exercise 4: Mobile IS

InstaMatch uses context-based information (i.e. location) to match users and recommend meeting points.

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Exercise 5: Platform markets

a) Explain how a platform market works.

b) Is InstaMatch using this kind of business model? Please reason why or why not.

c) What are direct and indirect network effects?

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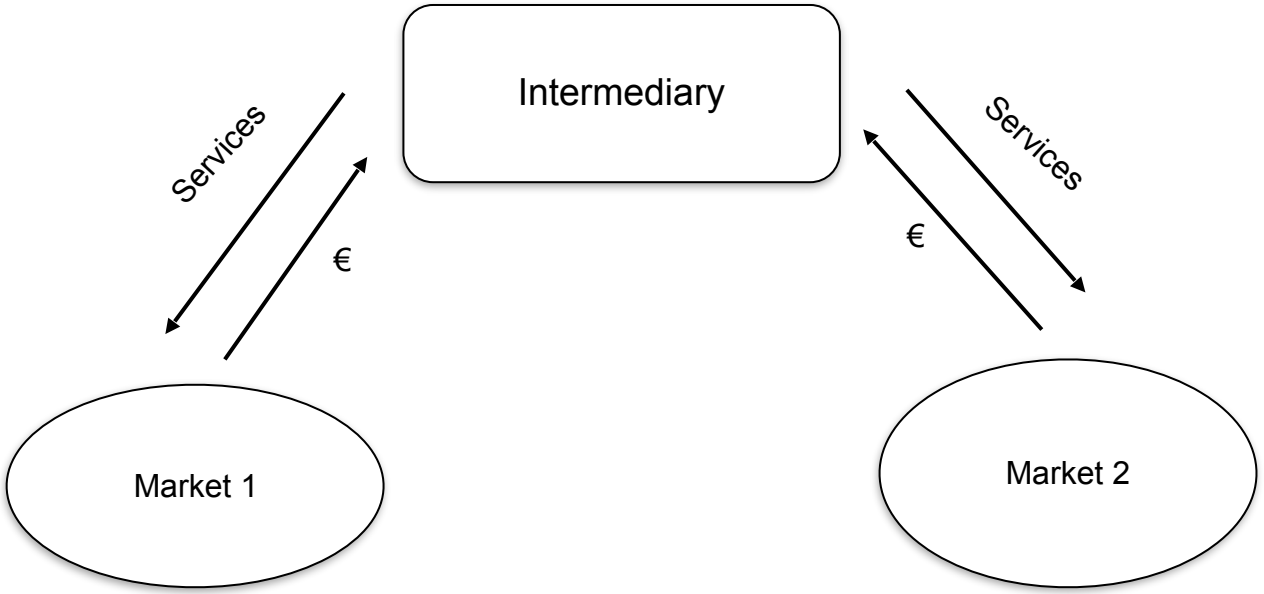
Exercise 5: Platform markets



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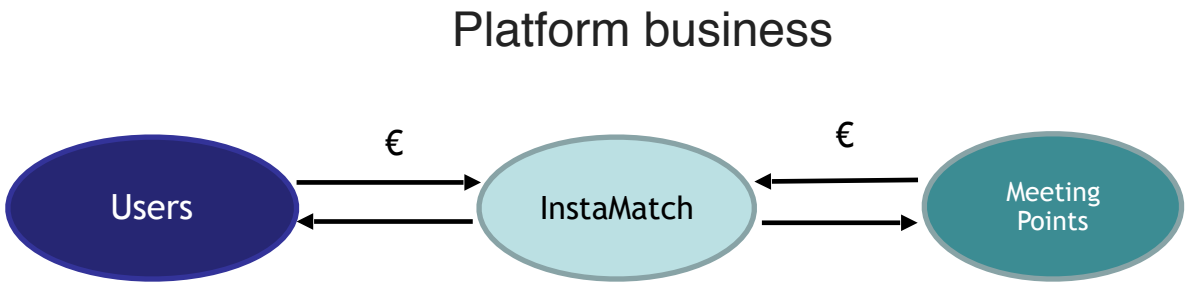

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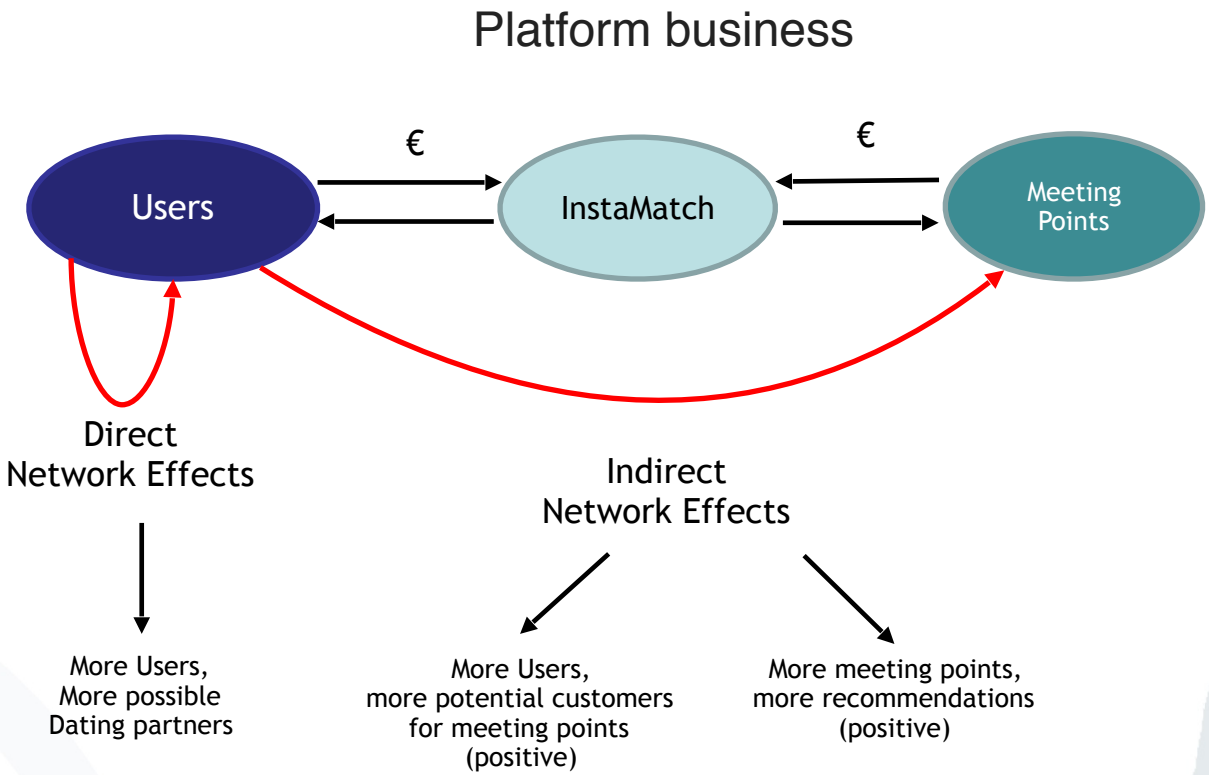

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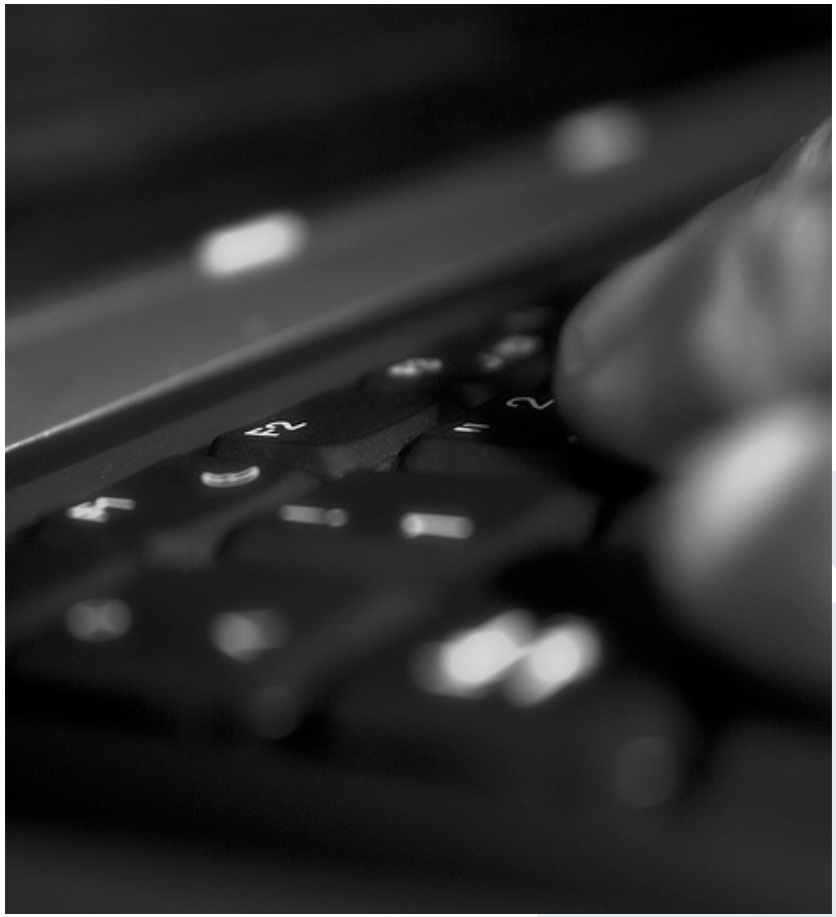

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