

Exercise 2

Economic Basics

Mobile Business I (WS 2024/25)

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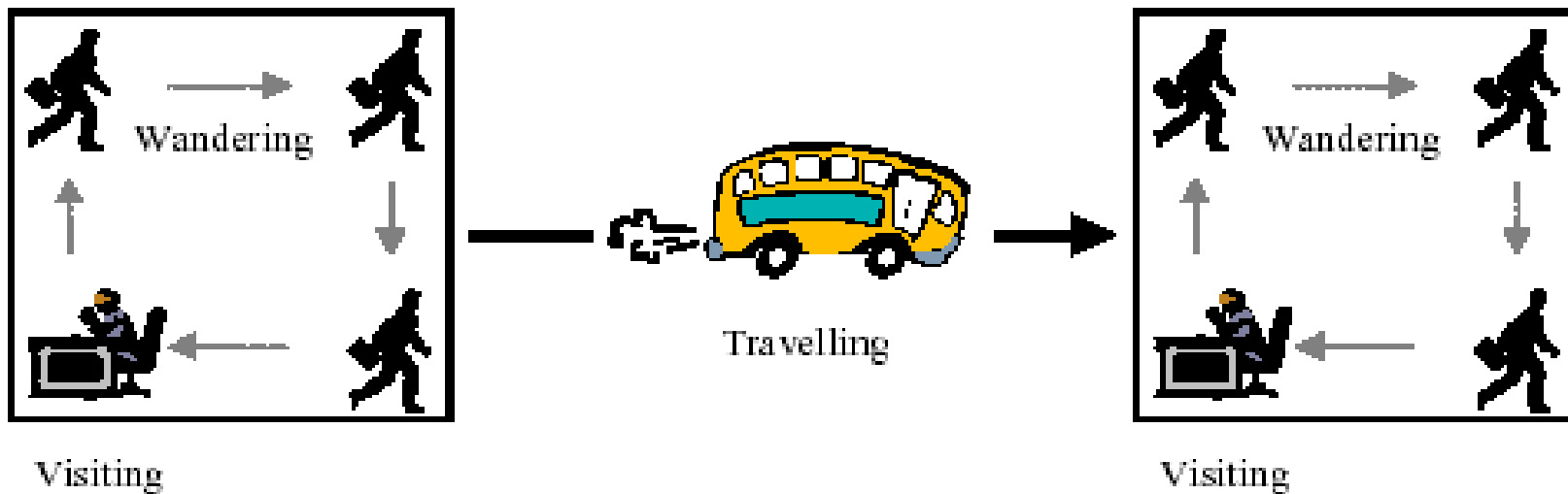
**Chair of Mobile Business & Multilateral Security
Goethe University Frankfurt a. M.**



- Exercise 1: L05 – E-Business vs. M-Business
- Exercise 2: L06 – Market Structure and Value Creation
- Exercise 3: L07 – Business Models

a) Name different degrees of mobility.

- Different degrees of mobility



[KristoLjungb1998]

- Visiting

- Working at different places for a little longer time
- Connectivity via network of the host or of a mobile operator

- **Example:**
German Parliament



- **Example: Accountant**
visiting a client



- Workation (Work+Vacation):

- Working in a different location/country than the dedicated work place. Employer stays the same.
- Employers often grant up to 30 days of workation within Europe.
- Need to consider legal and tax requirements, proper insurance as well as suitable technical setup.



- Digital Nomad:

- Working from anywhere, with travel time in between.
- Suitable for jobs that require only an internet connection: programmers, bloggers, marketing / data science manager
- Usually self-employed and on a freelancing basis
- Different legal and tax requirements, depending on the country of residence and length of stay



b) Explain E-Business and M-Business.

Various Electronic Business (E-Business) definitions...

“**E-Business:** Doing business online.” [TechwebNetwo2013]

“E-Business is about business transformation, changing the way companies go to market, impacting what they sell and how they create value.” [Kortzfleisch2005]

“E-Business... the conduct of business on the Internet, not only buying and selling but also servicing customers and collaborating with business partners.” [Searchcio2007]

“using the internet to connect with customers, partners, and suppliers”

...

Many definitions of Mobile Business (M-Business)...

“**M-Business**: Doing business using wireless services. The mobile counterpart to E-Business.” [TechwebNetwo2013]

“The total sum of business processes based on location-independent interactive communication technologies.” [ReicMeieFrem2002]

“We define M-Business as a collection of mobile technologies and applications used to support processes, value chains and entire markets using wireless technology.” [Stanoevska-S2003]

...

We chose a definition that (hopefully) lets us do interesting things:

*"The usage of
**mobile devices, infrastructure, communication,
and interaction**
for
**mobile applications
and transactions.**"*

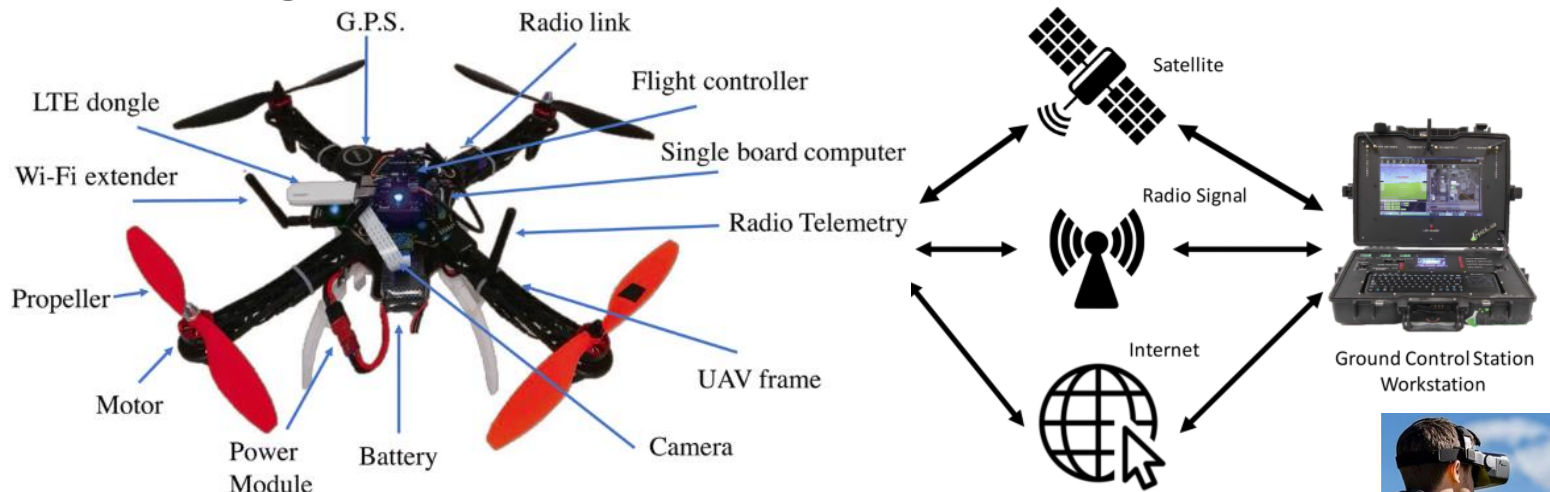
- c) Explain the working mechanism of small unmanned aerial vehicles or systems (sUAV or UAS), or small drones, currently used in warfare and relate them to mobile business.
How they do communicate and how can communication be jammed?



@EuroMaidan, Bhodan Ben

Unmanned Aerial Systems

- Consists of (multiple) UAVs/ small drones and the underlying ground control station (GCS) and operator on the ground.
- In current wars, inexpensive FPV (First Person View)-drones are increasingly used for surveillance and attacks on small and mobile targets.



[Aljehani et al., 2020]



Unmanned Aerial Systems

- Use a mixture of communication channels, e.g. DJI drones use DFS and 2,4 GHz, 5,8 GHz¹, satellite 4G/5G.
- Radio: can be HF (high frequency) and UHF (ultra high frequency), more range than Wi-Fi but still limited to line-of-sight (LOS).
- Cellular: 4G/5G enable BVLOS (beyond visual line of sight), e.g. through Starlink terminals, that encrypt data.
- → Continuous development and research on mobile communication

¹ <https://store.dji.com/de/product/dji-transmission-combo?vid=116751>

UAS countermeasures

- Objective is to hinder communication and UAS usage, without damaging surroundings.
- UAVs can be detected through radio frequency systems, acoustic methods, thermal imaging.
- Anti drone guns and jammers are used to:
 - Cut video transmission
 - Block wide range of radio frequency (RF) bands
 - Block global navigation satellite system (GNSS) usage
 - Obtain drones for further investigation
 - Work up to 2km of range



@DailyMail, APF via GettyImages

GPS and Radio Frequency jamming:

- Electromagnetic noise is blasted at radio frequencies (RF), to drown communication between UAV and operator.
- Methods: Continuous Wavelength (CW), Narrow band, Phase Shift Keying (PSK)
- GPS spoofing: spoofer sends stronger fake GPS signal
- Protection against jamming include beam and null steering as well as mechanical solutions

Disadvantages / limitations:

- Jammers mostly illegal.
- (Mostly) unable to locate operator or forecast the flightpath, limiting their effectiveness
- Disrupt nearby communication
- Do not obtain control over UAV.

- Exercise 1: L05 – E-Business vs. M-Business
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- a) Explain heterogeneous oligopoly as a market structure.

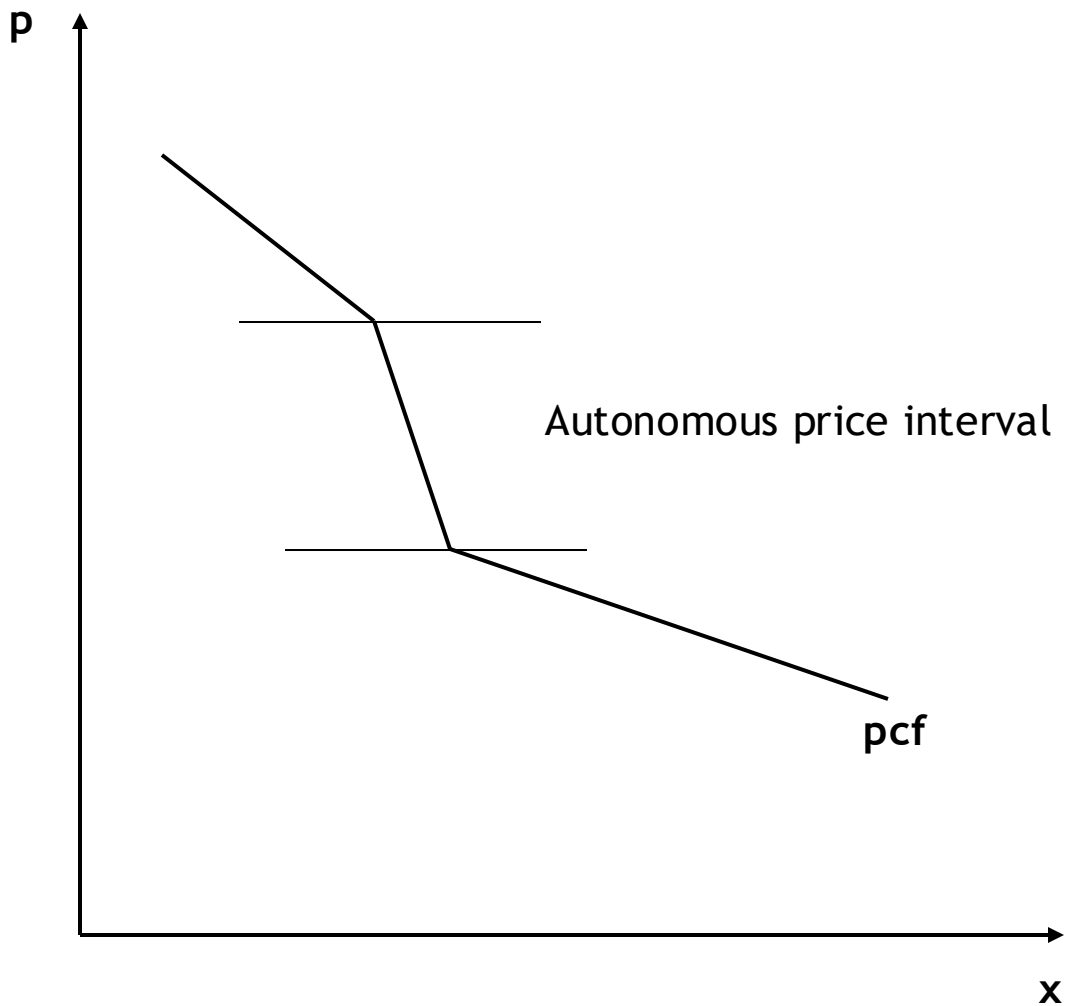
- ➔ Few mobile network operators, many customers

- Heterogeneous oligopoly
 - A heterogeneous oligopoly is a market form, in which a market or industry is dominated by a small number of middle-sized sellers with heterogeneous products
 - Many (small-sized) customers

Based on [Wied-Nebbeli1997]

- Heterogeneous oligopoly
 - Autonomous price interval, in which the respective organisation (operator) can operate...
 - o without losing customers to the business competition due to rise in price
 - o without acquiring customers from business competition due to cut in price

Based on [Wied-Nebbeli1997]



- Exercise 1: L05 – E-Business vs. M-Business
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a) What is a business model?

- A business model is the abstract description of a business.
- → more simpler: strategic planning to earn money
- Clauss (2017):
a company's strategic approach to create a unique value proposition for its customers, realizing this value through its operational processes and activities, and capturing financial profit from the value generated.

- b) Name and describe the elements of a business model.

- A business model consists of three main parts:
 1. Value Proposition
 2. Value Creation Architecture
 3. Revenue Model (Value Capturing)

1. A business model contains a **description of** what the **benefit** can be for customers or other partners by association with the respective business. This part of the business model is called **value proposition**.

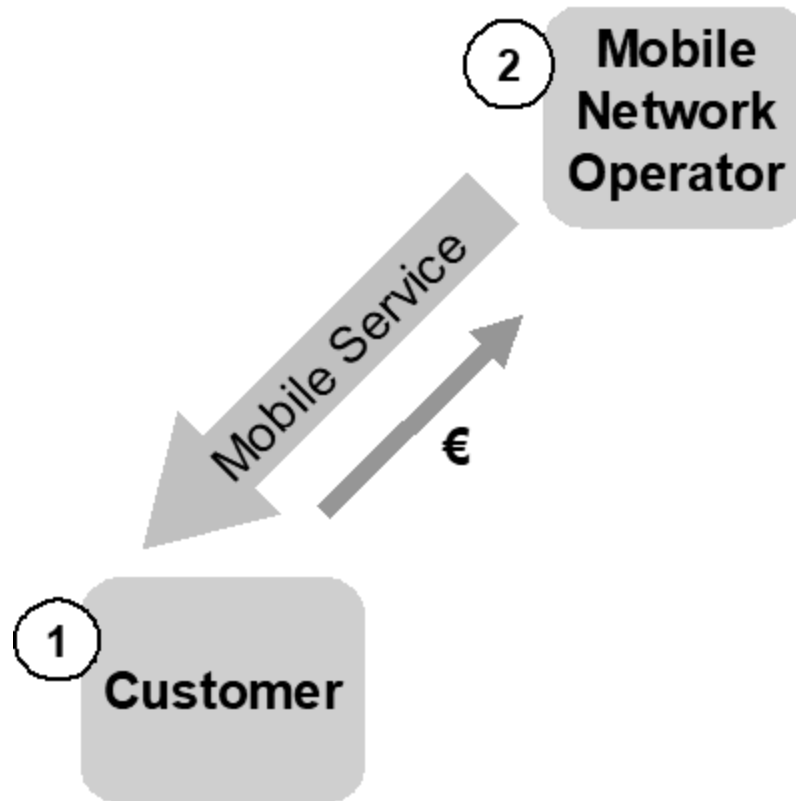
2. At the same time a business model is a **value creation architecture**, namely how the benefit can be generated for the customers. This architecture contains a description of the different stages of value creation.

3. Besides asking for "*what*" (see 1.) and "*how*" (see 2.) a business model describes as well, which revenue the business generates from which sources. The future revenue decides on the value of the business model and the sustainability.

c) Outline a classic business model for a mobile service (while paying special attention to stakeholders, money and service flows).

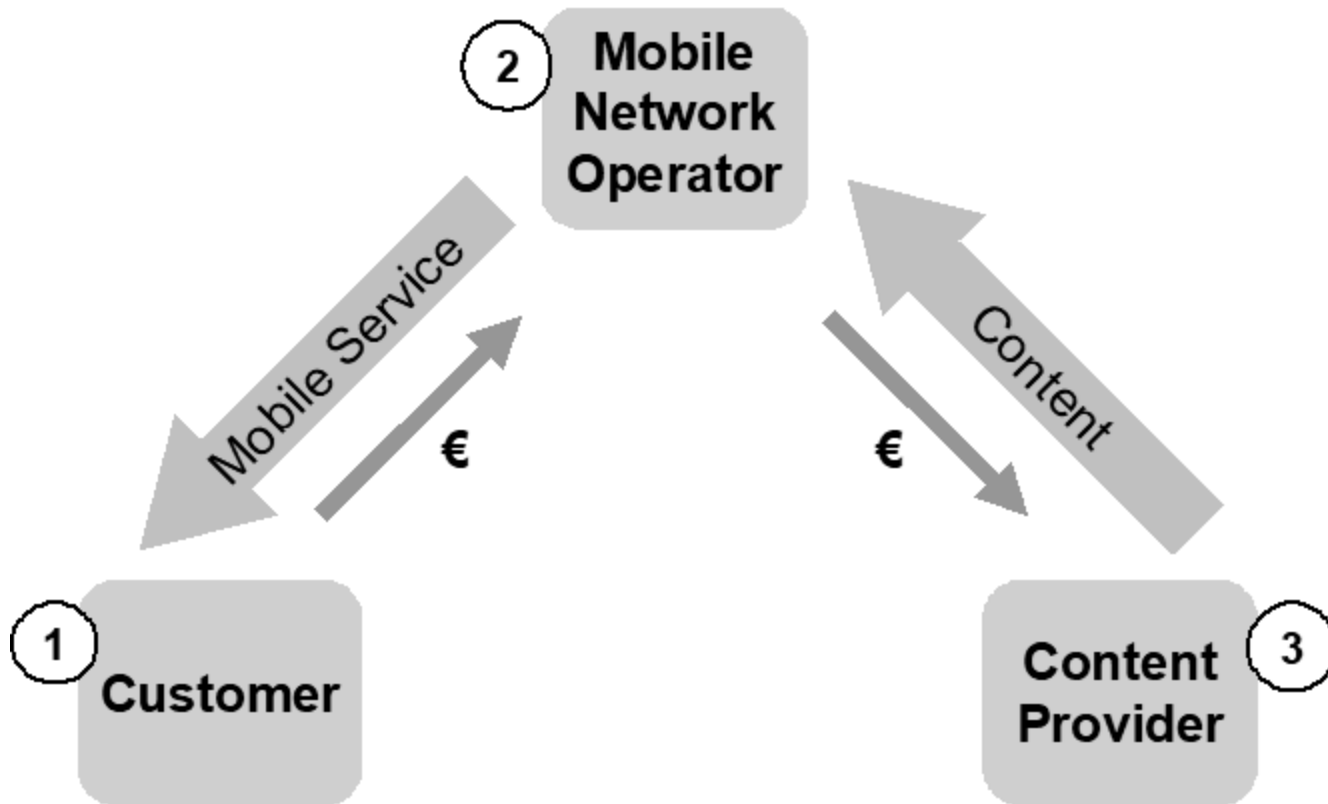
Classical Business Models for Mobile Network Operators

- Classical business model (CBM) I:



- Classical business model I:
 - Two parties: Customer, mobile network operator
 - Operator provides communication services and possibly contents to the customer.
 - Possibly the operator manufactures these contents himself.

- Classical business model II:



- Classical business model II:
 - Three parties: Customer, mobile network operator, content provider.
 - Operator purchases content (from the content provider) and passes it on to the customer.
 - Content Provision is not the core competence of the network operator.

d) How could the business model of telcos be affected by the continuous digitalization and new trends, such as Generative AI? Use the terms outlined in question b).

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1. Value Creation

- Generating value through new or improved operational processes and activities.
- Could impact key resources, processes, capabilities, changes in ecosystem
- Ideas
 - Automation of network management
 - Offering of better personalized services
 - New service platforms

d) How could the business model of telcos be affected by the continuous digitalization and new trends, such as Generative AI? Use the terms outlined in question b).

2. Value Proposition

- Providing value to customers
- Could impact offerings, clients and markets, customer relationships
- Ideas:
 - AI-enhanced customer interaction, changes customer relationship.
 - Likely no new customer segments?
 - Opportunity for new media services as new offering.

d) How could the business model of telcos be affected by the continuous digitalization and new trends, such as Generative AI? Use the terms outlined in question b).

3. Value Capturing

- Capturing financial profit from the generated value while considering cost structures
- Could impact revenue streams and main costs.
- Ideas:
 - AI-based monetization models: data driven-dynamic pricing for data plans based on network load and customer usage patterns.
 - Data monetization: analyzing and provision of data as a new revenue stream.
 - Additional costs for integration of AI companies and AI services

- This set of slides is based upon the following Economic Basics lectures:
 - **Lecture 5:** E-Business vs. M-Business
 - **Lecture 6:** Market Structure and Value Creation
 - **Lecture 7:** Business Models

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Aljehani, M., Inoue, M., Watanbe, A. *et al.* UAV communication system integrated into network traversal with mobility. *SN Appl. Sci.* 2, 1057 (2020).
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<https://www.defenseadvancement.com/wp-content/uploads/2022/03/GPS-Jamming-How-it-Works-Methods-of-Prevention.pdf>