

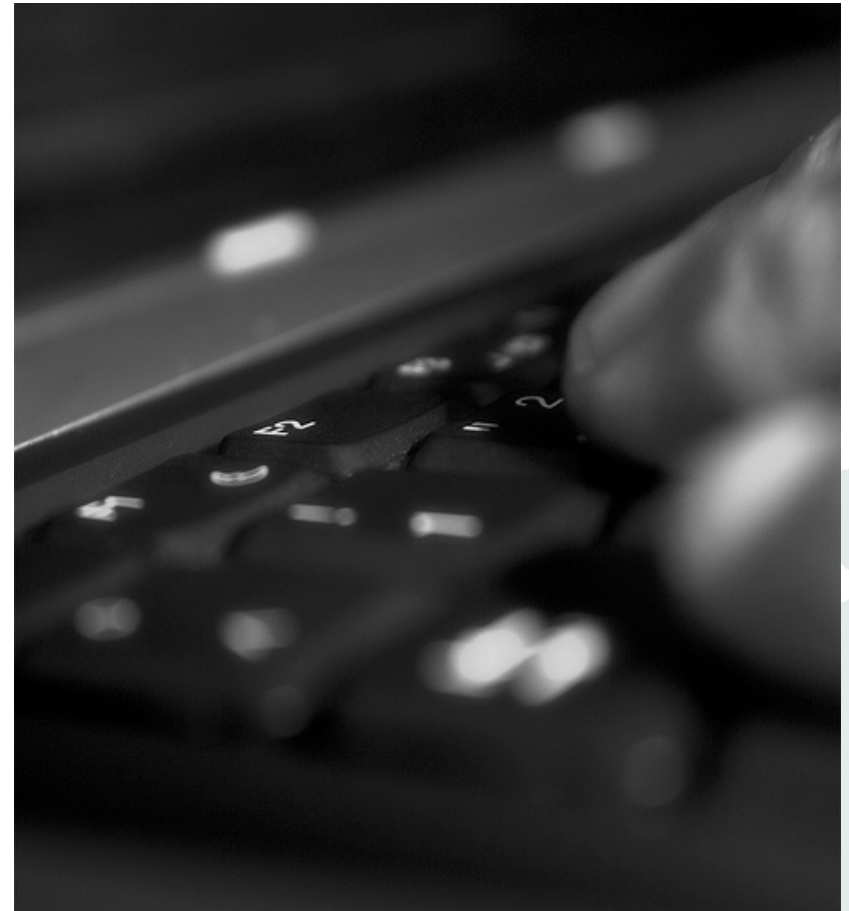
Lecture 14 Business Informatics 2 (PWIN)

Q&A

WS 2017/2018

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www.m-chair.de

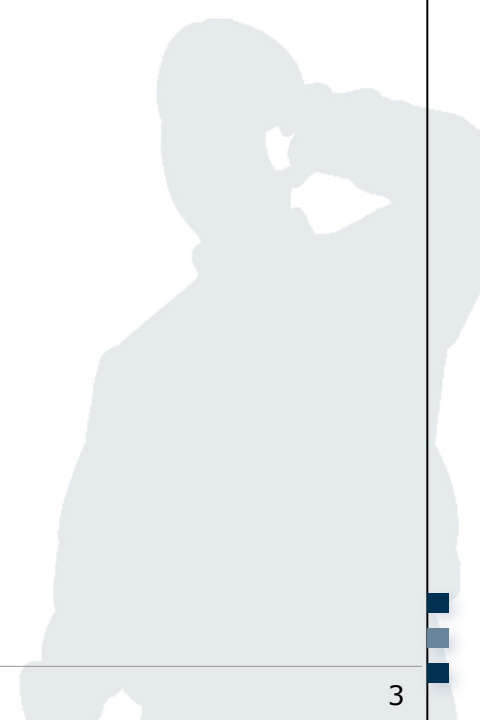


Jenser (Flickr.com)

Welche Themen sind nicht klausurrelevant?

Nicht klausurrelevante Themen:

- Vorlesung 13: Business Process Reengineering

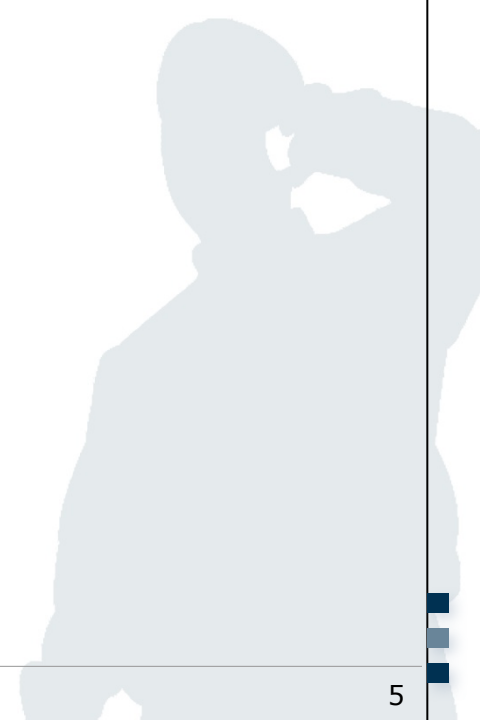


Gastvorträge

- Wie relevant sind die Gastvorträge?

Gastvorträge

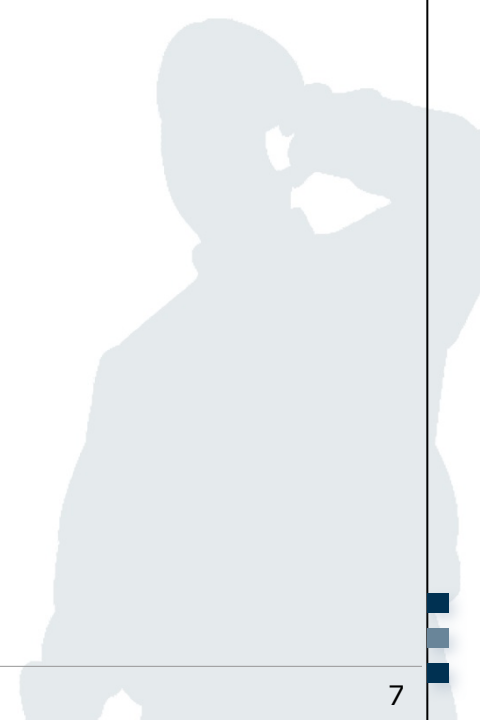
- Die Gastvorträge sind genauso klausurrelevant wie die Vorlesungsinhalte



Organisatorisches

- Wird die Klausur auf Deutsch oder Englisch gestellt?
Und in welcher Sprache darf ich antworten?

- Die Aufgaben werden auf Deutsch gestellt.
- Sie dürfen auf Deutsch und Englisch antworten.



Informationssysteme

- Worin genau besteht der entscheidende Unterschied zw. Information- & Applicationsystem?

Vorlesung 2

Slide 3

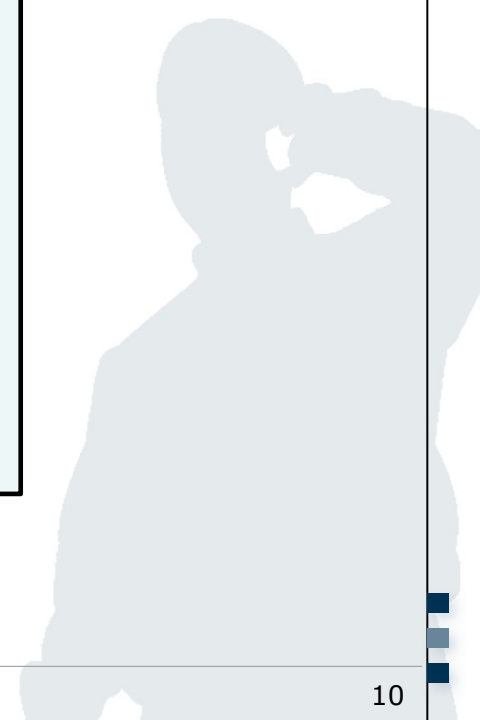
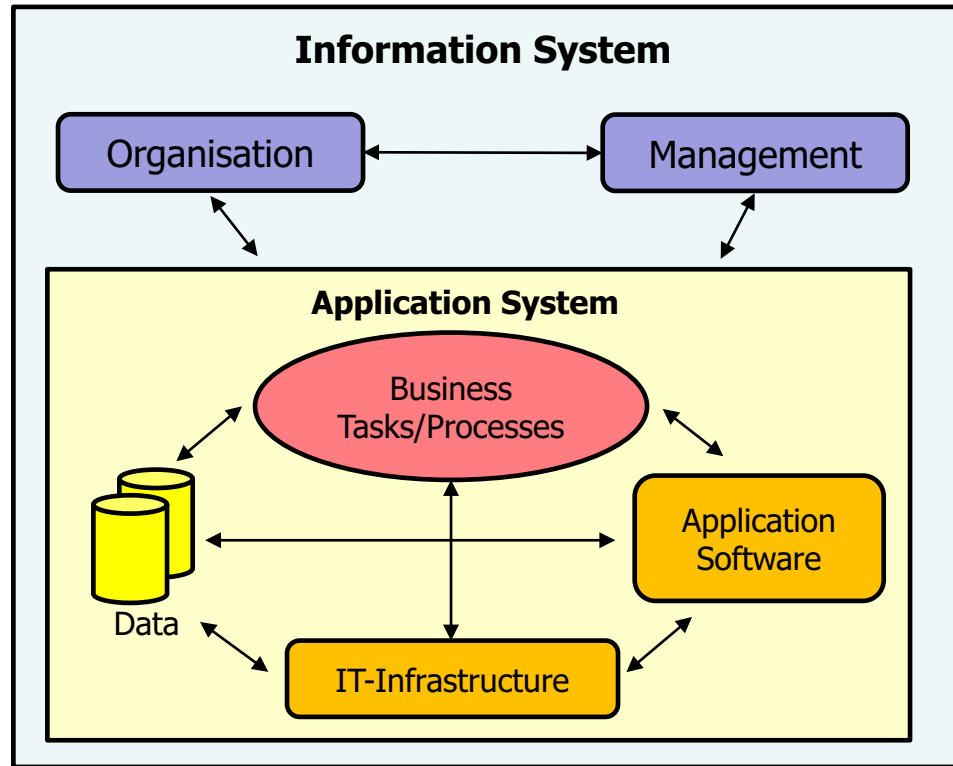
- **Information System (IS):**

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

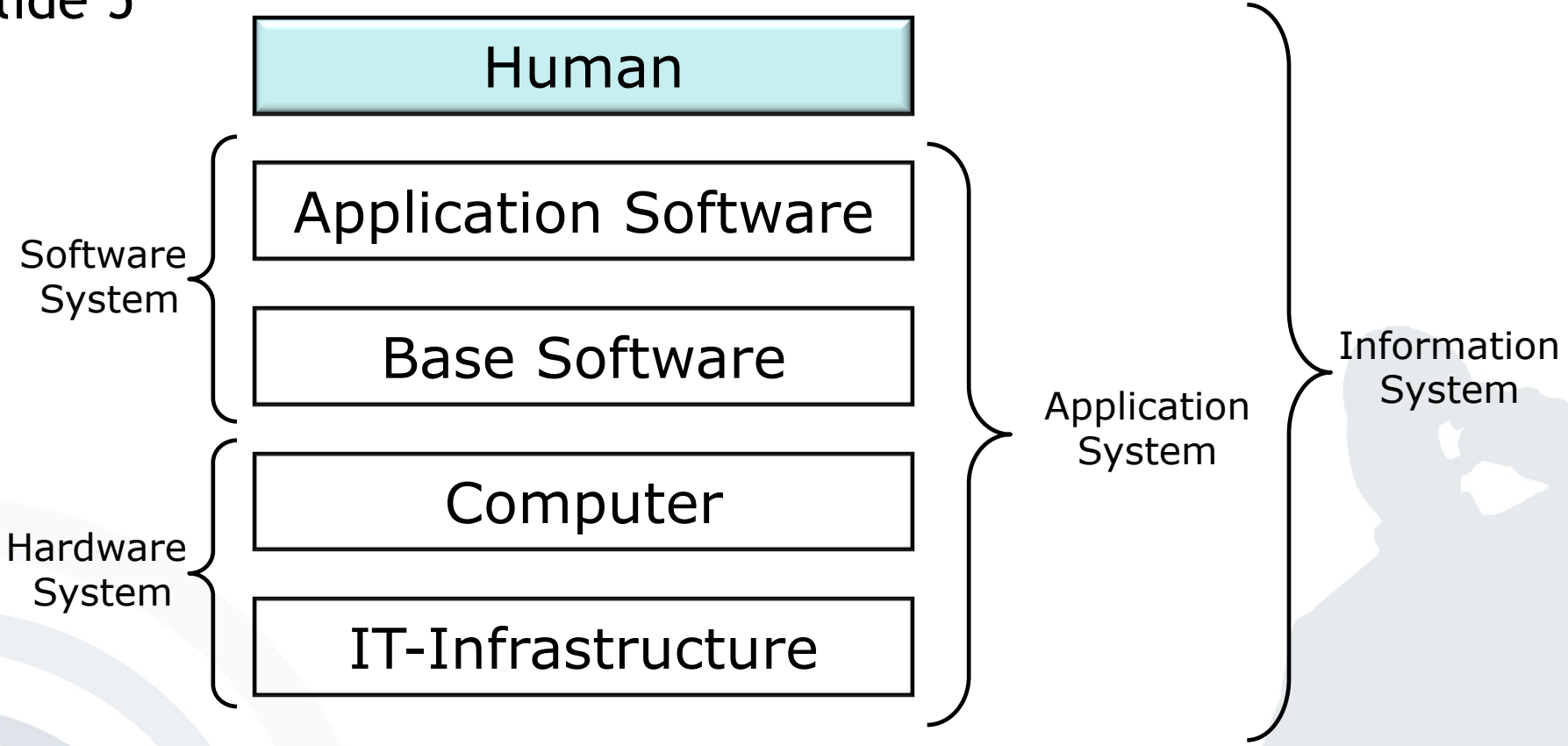
- **Application System (AS):**

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.

Source: Laudon, K.C., Laudon, J.P., Schoder, D. (2010), p. 18.



Vorlesung 2
Slide 5



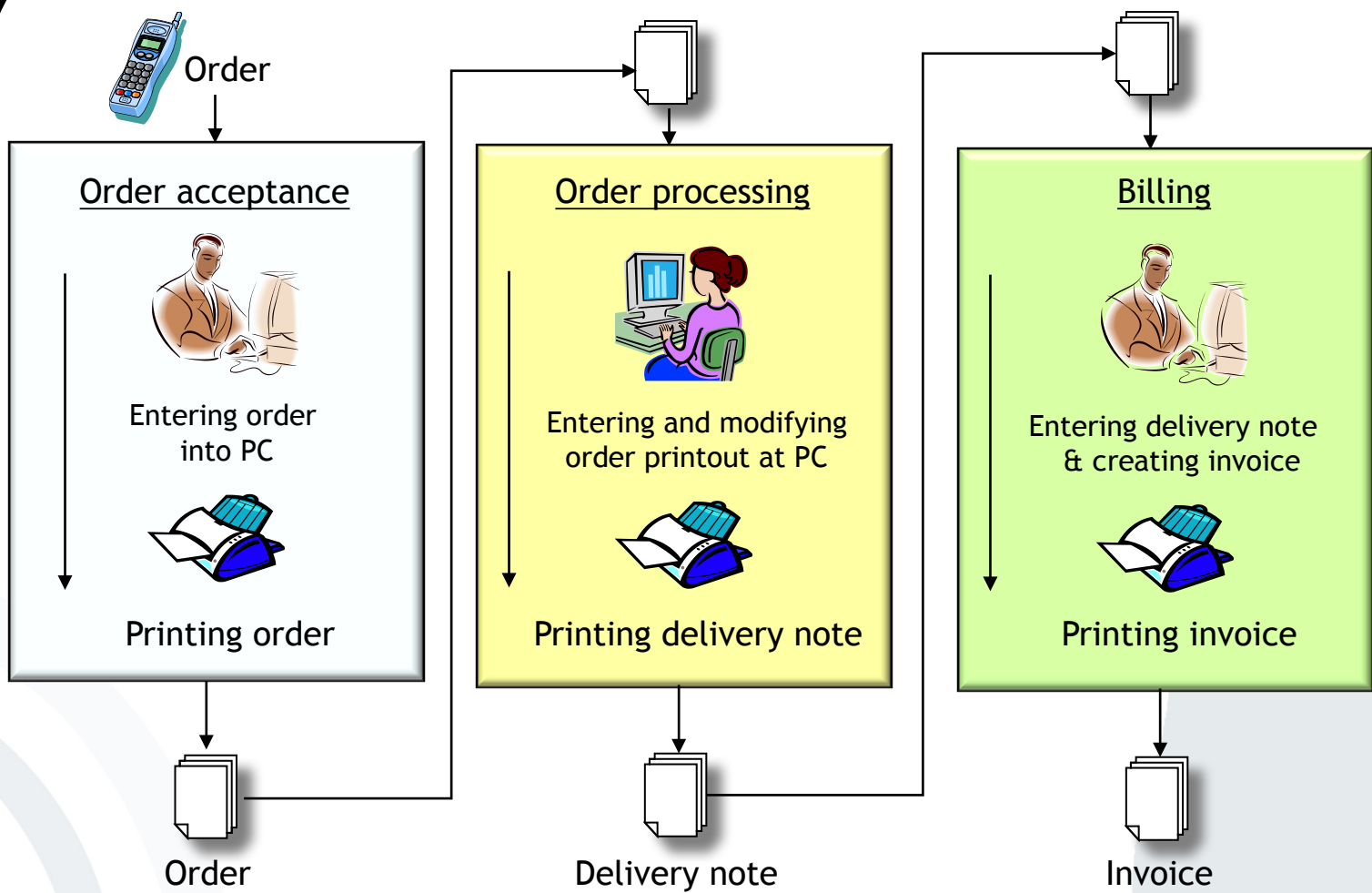
Source: Teubner (1999)

Informationssysteme

- Können Sie nochmal den Zusammenhang zwischen isolierten und verbundenen Informationssystemen in Bezug auf Enterprise Modelling erläutern?
- Isolated Informationssystem = mehrere voneinander isolierte Informationssysteme?
- Connected Informationssystem = mehrere miteinander verbundene Informationssysteme (oder nur ein gr. System)?

Isolated Information Systems

Vorlesung 2 Business process in an enterprise (example)
Slide 27



Source: Based on Schwickert, 2015

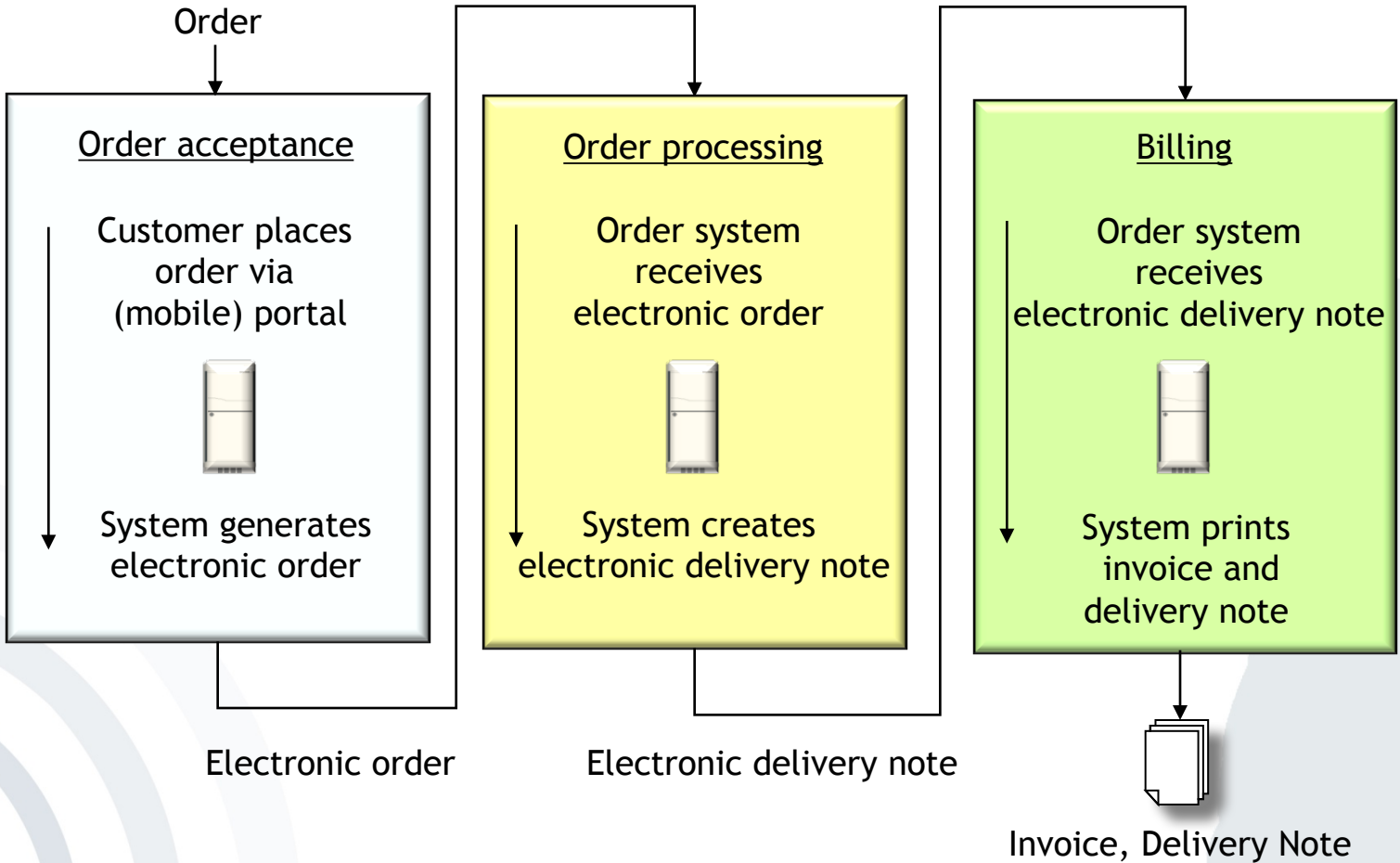
Vorlesung 2 Slide 28

Due to media disruptions between Information Systems, isolated Information Systems are

- prone to errors,
- personnel-intensive,
- cost-intensive,
- and inflexible (e.g. regarding order modifications).

Further, media disruptions also lead to

- long processing times and
- complex controlling due to lack of common data basis.



Source: Based on Schwickert, 2003

- Requirements for the development of connected Information Systems



- Holistic view on an enterprise and its organisation, management, business processes, resources, etc.



- Enterprise Modelling as approach



Vorlesung 2 Slide 31

- Enterprise Modelling

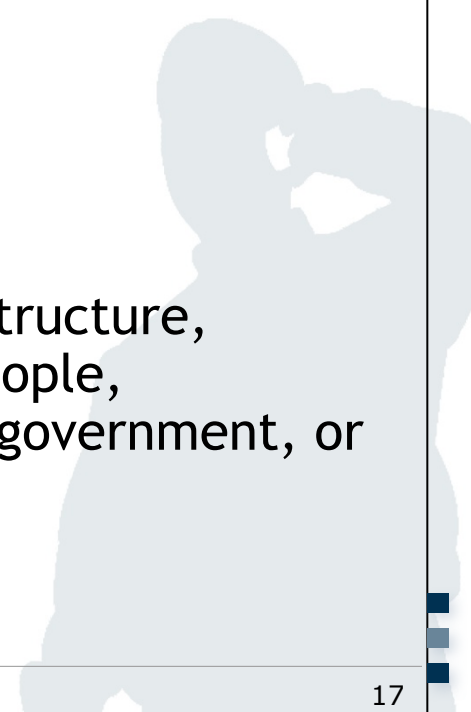
- Enterprise modelling is the abstract representation, description and definition of the structure, processes, information and resources of an identifiable business, government body, or other large organization.

(Source: Leondes and Frymuth Jackson 1992)

- Enterprise Model

- An enterprise model is a representation of the structure, activities, processes, information, resources, people, behaviour, goals, and constraints of a business, government, or other enterprises.

(Source: F.B. Vernadat 1997)



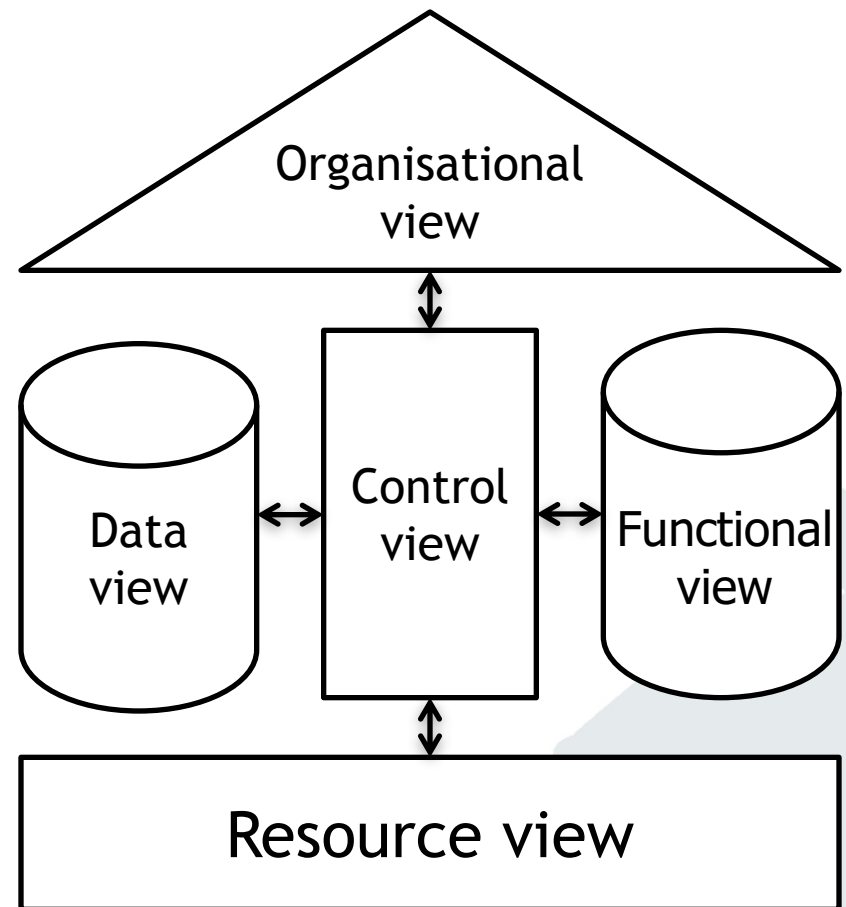
ARIS

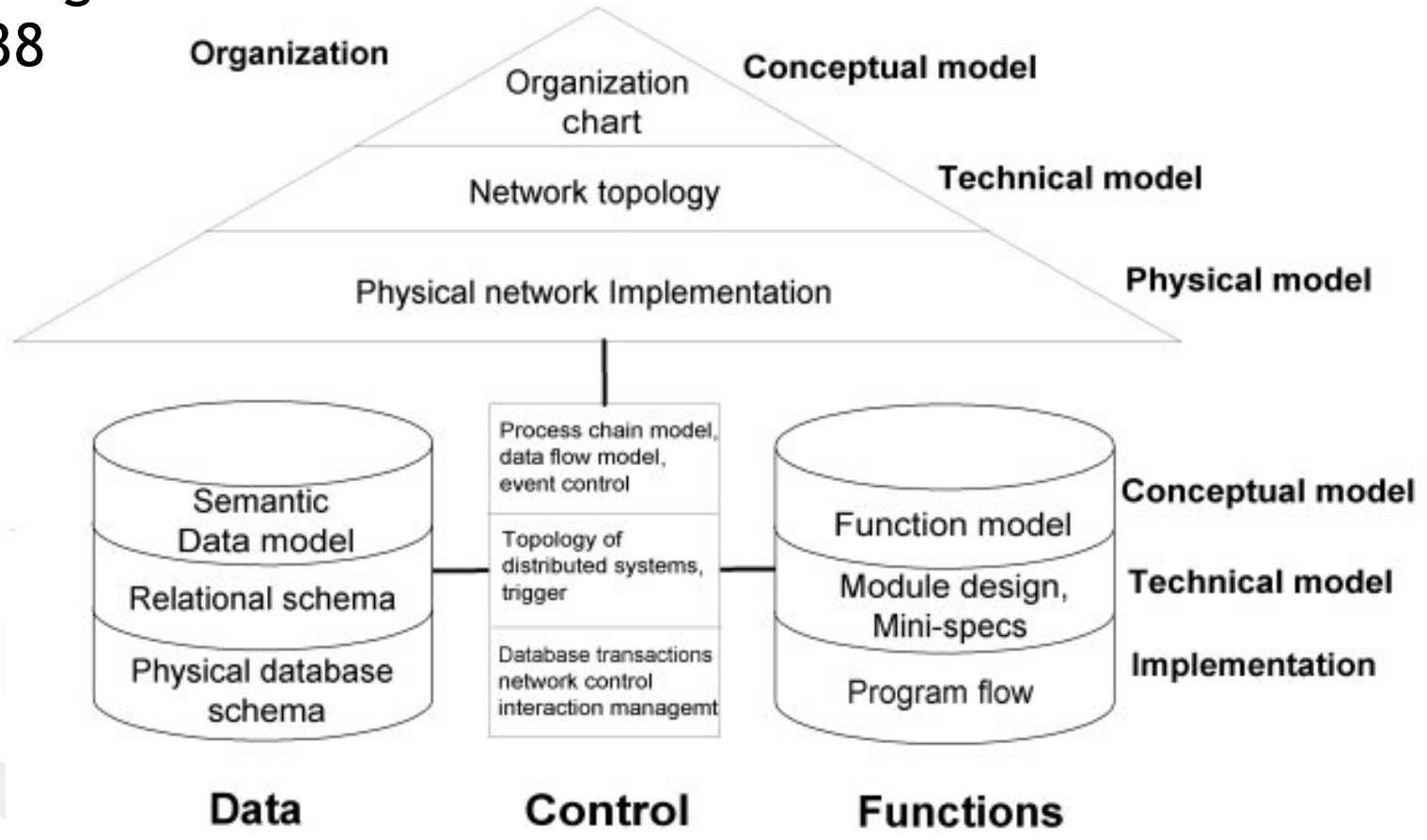
- Für WAS genau nutzt man ARIS, wofür ist es gedacht?

- Enterprise modelling framework
- Offers methods for analysing (business) processes
- Provides a holistic view of process design, management, work flow and application processing
- Originally developed by Prof. Dr. August-Wilhelm Scheer in the 1990es

Vorlesung 2 Slide 37

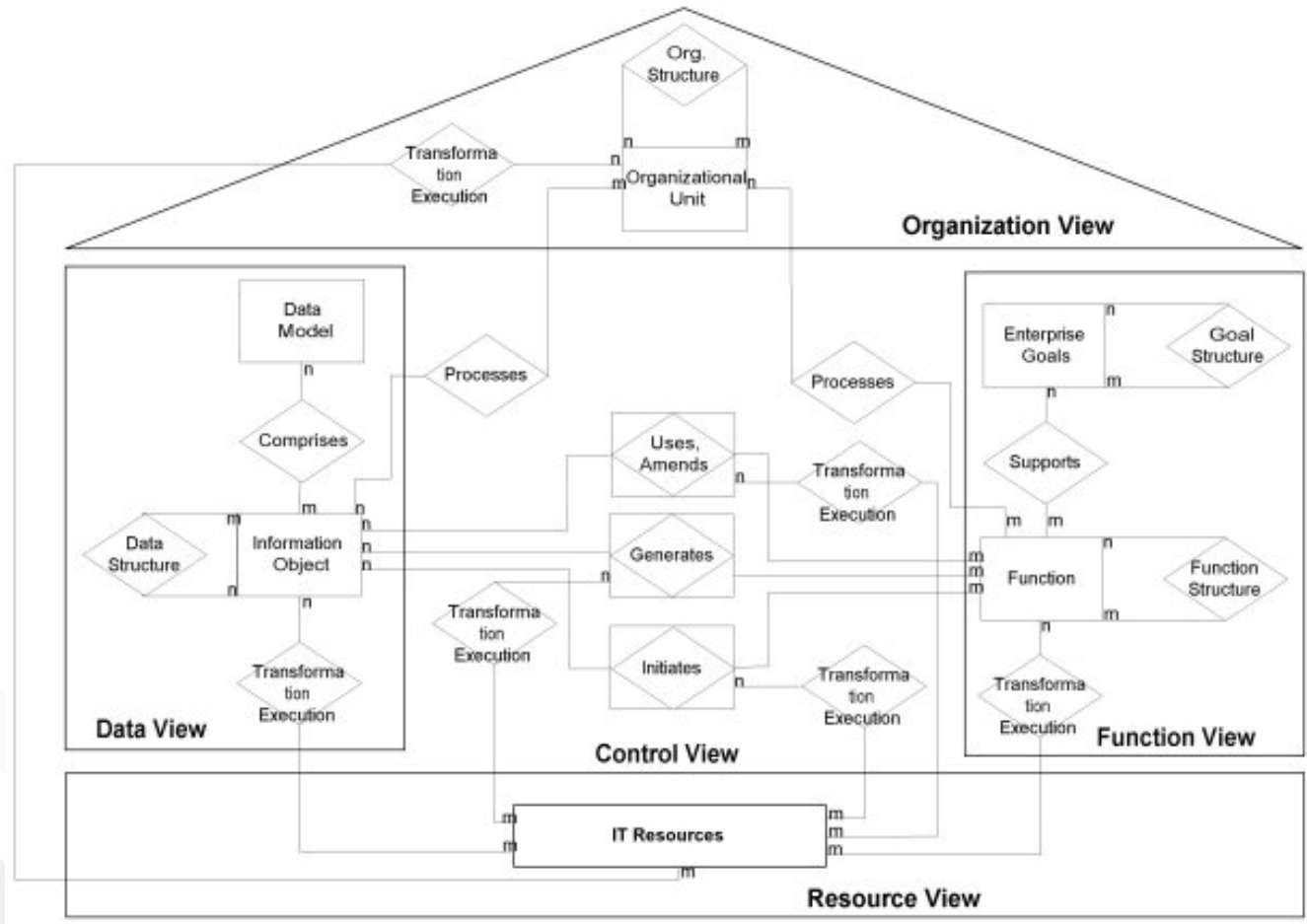
- **Organisational view**
 - Resources (humans, machines, hardware, etc.)
 - Organisational chart
- **Functional view**
 - All processes generating output as well as their relation to each other
 - Function tree
- **Data view**
 - All events generating data (e.g. documents, e-mails, etc.)
 - Entity-relationship model
- **Control view**
 - Integration of all other views into a logic process
 - Event-driven process chains
- **Resource view**
 - Services, products and financial assets
 - Product tree





ARIS Architecture

Source: pera.net, 2011



Information model of the ARIS architecture

Source: pera.net, 2011

Vorlesung 2
Slide 40

Control view

Data view

Functional view

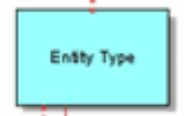
Concept
"Fachkonzept"



Data Processing Concept

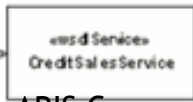
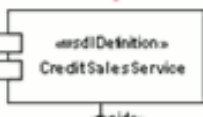
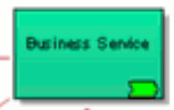
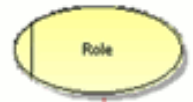


Implementation



```

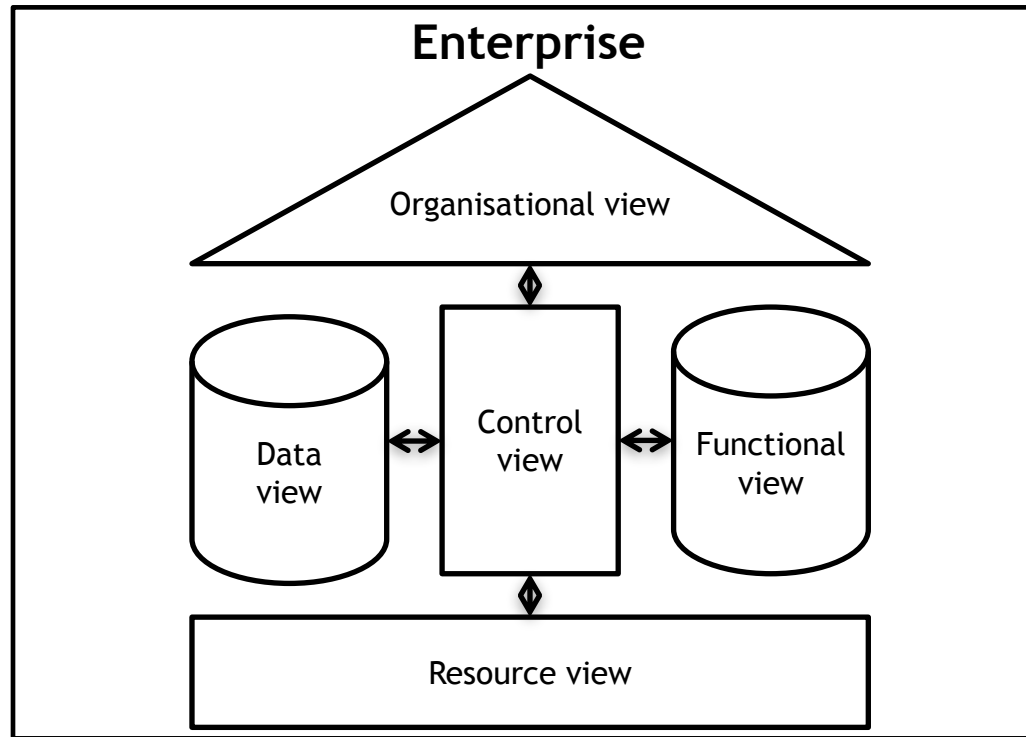
XSD Data Element
title: title
odNR: int
credit_provision: credit_provision
max_credit_amount: float
positive_money_availability: boolean
worthiness: int
desired_credit_amount: decimal
granted_credit_amount: decimal
contact_person: String
    
```



Source: ARIS Community

Modellierung

- Worin genau besteht der Unterschied zw. Enterprise-models & IS-Architecture-models?



Information system architectures

Vorlesung 3

Slide 6

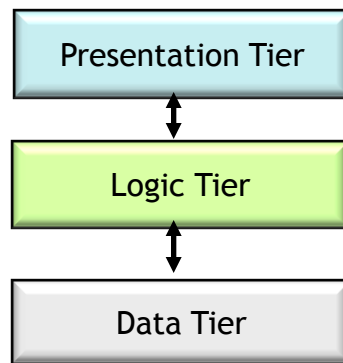
- Minimisation of complexity for IS Components
- Scalability of IS components
- Portability of IS components
- Maintainability of IS components
- Standardisation of IS components
- Well-defined interfaces between IS components
- Independence of IS components

Modularisation of IS components

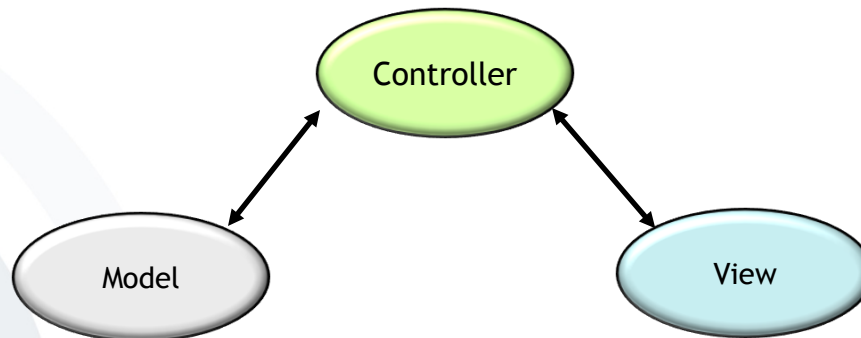
Vorlesung 3

Slide 7

- Three-tier concept



- Model-view-controller (MVC) concept



Client/Server Architecture Along the Three-Tier Structural Concept

Terminal emulation

Central server



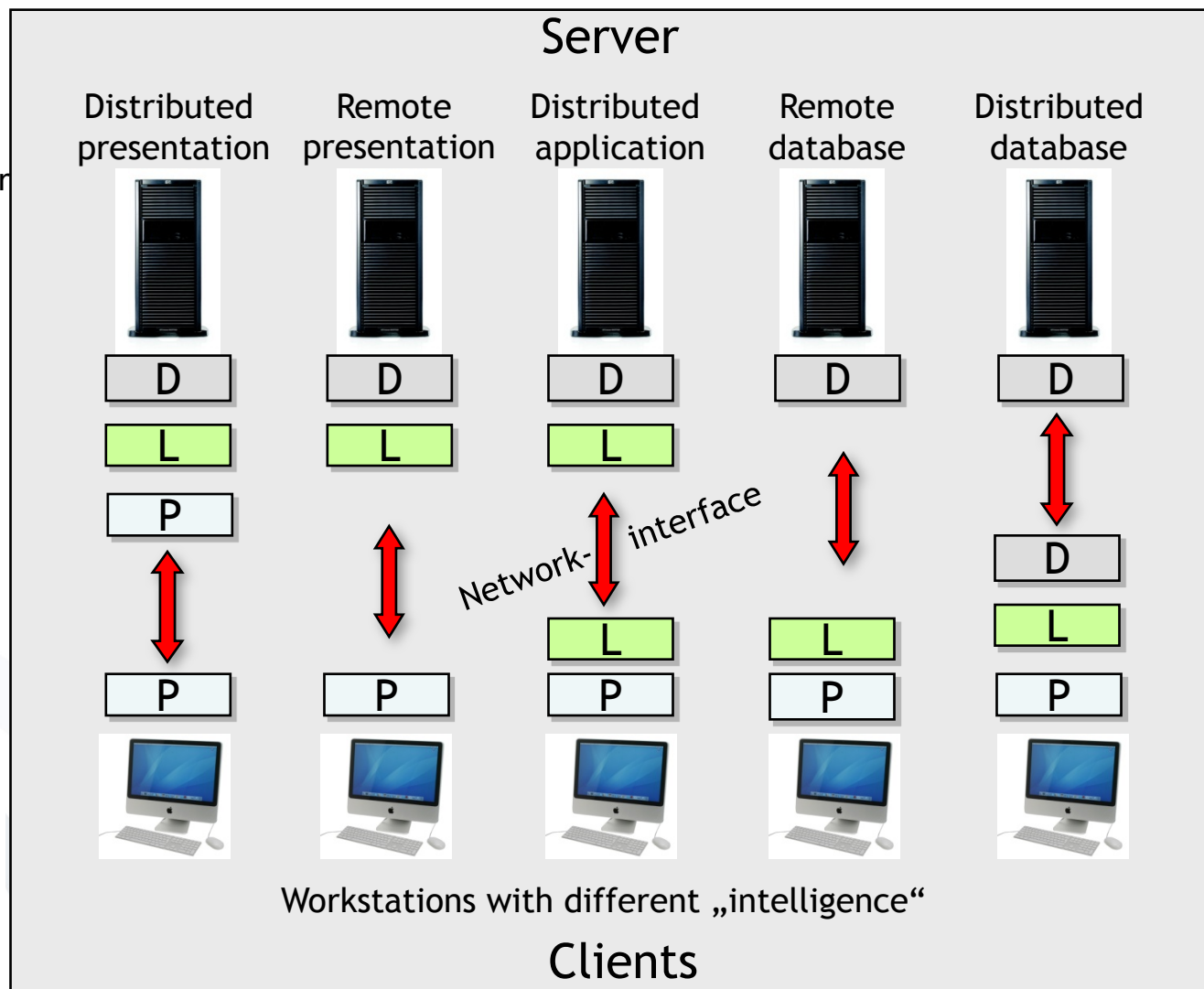
D

L

P



„Dumb“ terminal



Fileserver LAN
Fileserver



D

L

P



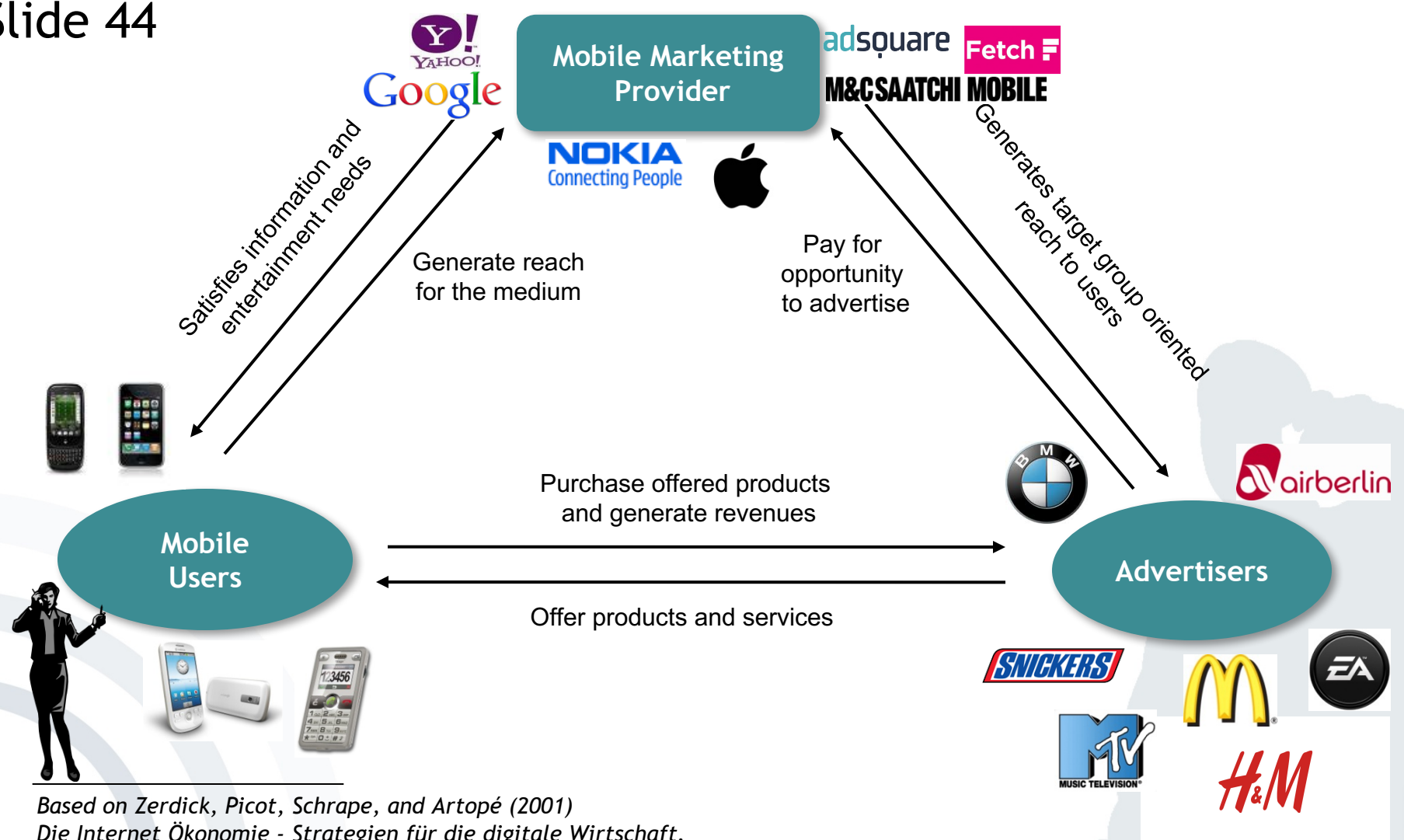
Local workstation

Source: Based on Hennekeuser, 2004

Zweiseitige Märkte

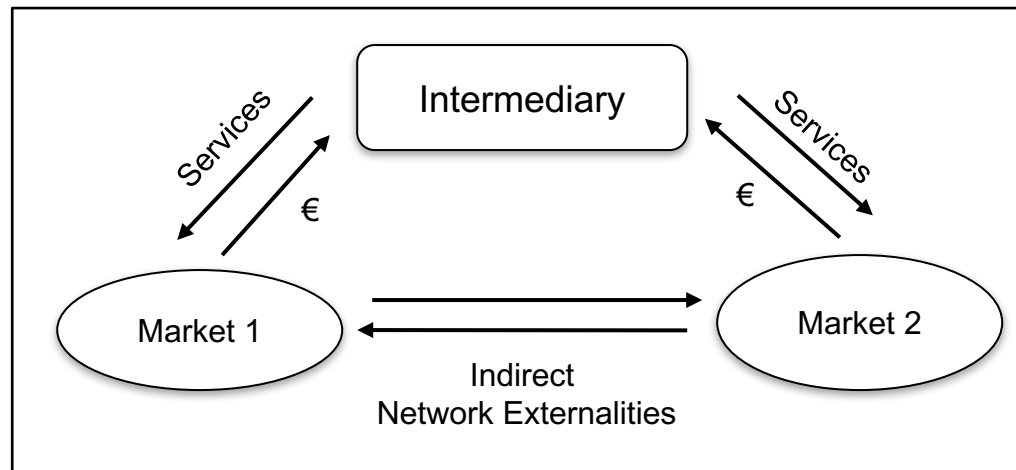
- Können Sie nochmal das Prinzip von Two-Sided Markets erklären?

Idealised Two-Sided (Mobile) Media Market



Based on Zerdick, Picot, Schrape, and Artopé (2001)
Die Internet Ökonomie - Strategien für die digitale Wirtschaft.

Vorlesung 4 & Exercise 2.5



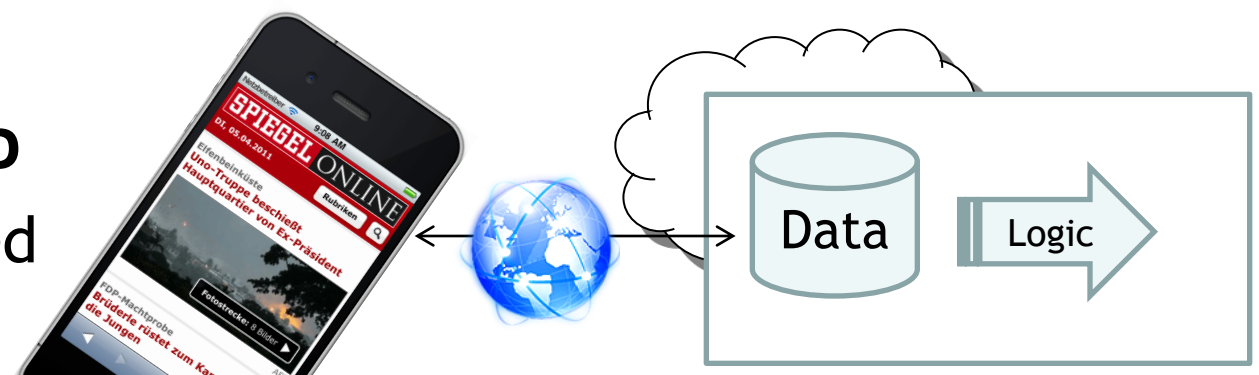
Mobile Anwendungen

- Bei Mobile App (native App) Daten & Logik auf Device oder Server?

Vorlesung 4
Slide 29

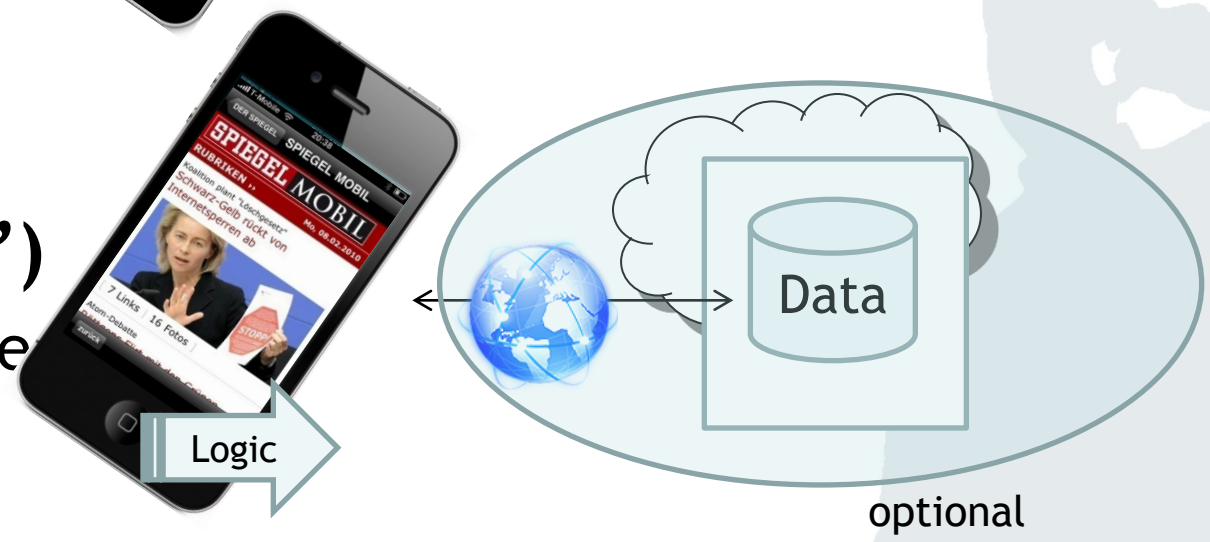
Mobile web app

- App not installed on the device



Mobile app (“native App”)

- App is downloaded and installed

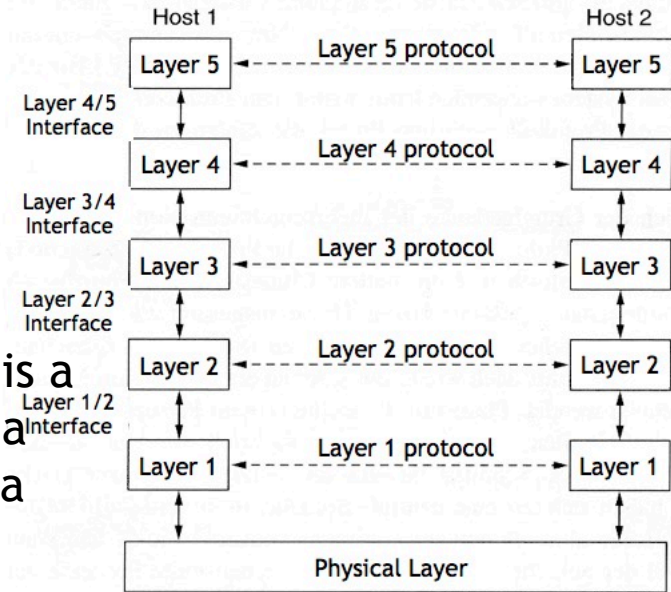


OSI-Modell

- Was genau ist ein Protocol?

Vorlesung 5 Slide 4

- The figure shows 5 layers.
- Communication inside one layer uses the respective **protocol**.
- In telecommunication, a communication **protocol is a** system of rules that allow two or more entities of a communications system to transmit information via any kind of variation of a physical quantity. The protocol defines the rules syntax, semantics and synchronization of communication and possible error recovery methods (Wikipedia).
- **No direct data communication** from layer n of one host to the same layer n of another host.
- Each layer sends data and control messages to the layer below until the lowermost layer was reached.
- Located below layer 1 is the physical transmission medium which is used for the communication.



Source: Tanenbaum (2006), p. 42

OSI-Modell

- Layer 1 bis 3 = Transportation, aber wo liegt zentraler Unterschied zw. 3 Layers?

- The **physical layer** is the lowermost layer of the OSI model. It defines **mechanical, electrical and time-related** specifications for interfaces to the network. It deals with the **transmission of bits** over a communication channel.
- Typical transmission-related questions are:
 - How to represent bits?
 - Definition and assignment of connectors and pins.
 - How to achieve full-duplex transmission (both directions simultaneously)?
 - Connection set-up and termination
 - Which are the available transmission media?

- **The data link layer contains algorithms for efficient and reliable communication between neighbouring communicating parties.**
 - **Tasks are:**
 - Error control
 - Flow control
 - Error detection and correction
 - **This can be assured by:**
 - Segmentation; allocation of data to small packets to be passed on sequentially
 - Confirmation; every packet which was properly received is confirmed by the communicating party which receives it
 - ...

- The **network layer** takes care of the transmission of packets **from the source to the destination**. This may also include *passing through* network segments on the way between two routers.
 - The main task of this layer is **routing**.
 - Network Layer needs to know about the topology of the communication network in order to be able to choose an adequate path for each packet
 - A path must be chosen carefully in order to avoid capacity overload or congestion of (sub)networks.

OSI-Modell

- Können Sie das Domain Name System, Layer 7 (Schaubild) nochmal erläutern?

Layer 7: Application Layer

Example: Domain Name System

Vorlesung 5
Slide 58



Address „m-chair.de“?

141.2.183.180

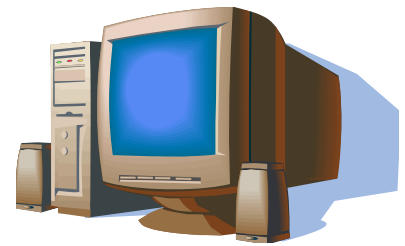
6



Query to authoritative DNS Server

5

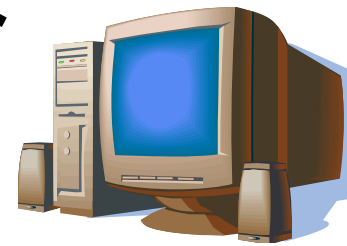
Authoritative DNS Server



4

Global search, result: author

3

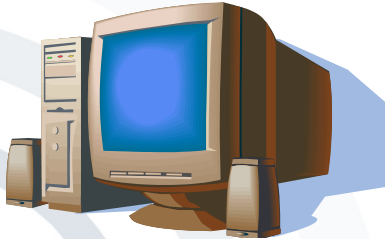


Root DNS Server

1

2

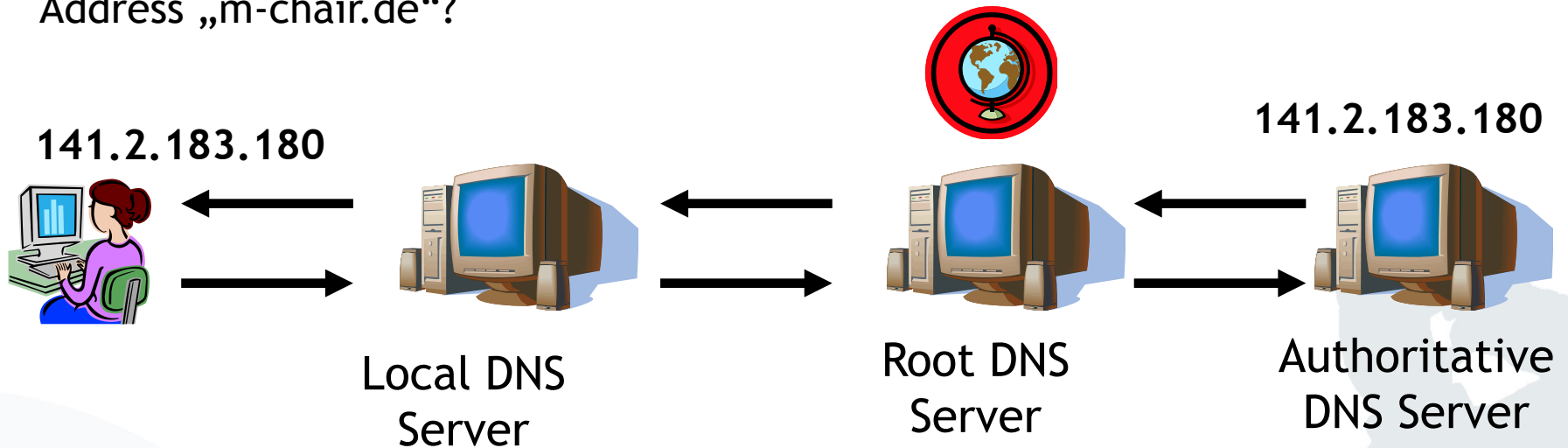
Local search, no result



Local DNS Server

Aim: Load-balancing for DNS queries

Address „m-chair.de“?



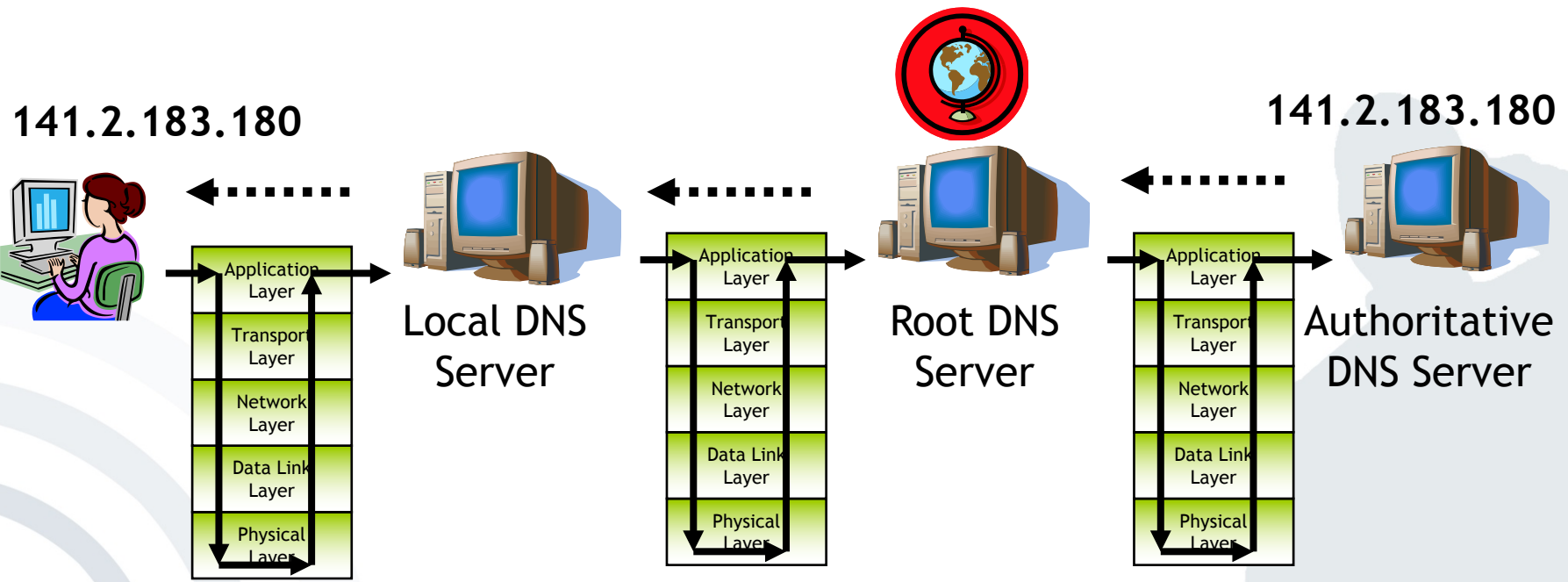
Layer 7: Application Layer Example: DNS and Layers

Vorlesung 5

Slide 60

DNS queries involve all the layers of the network stack.

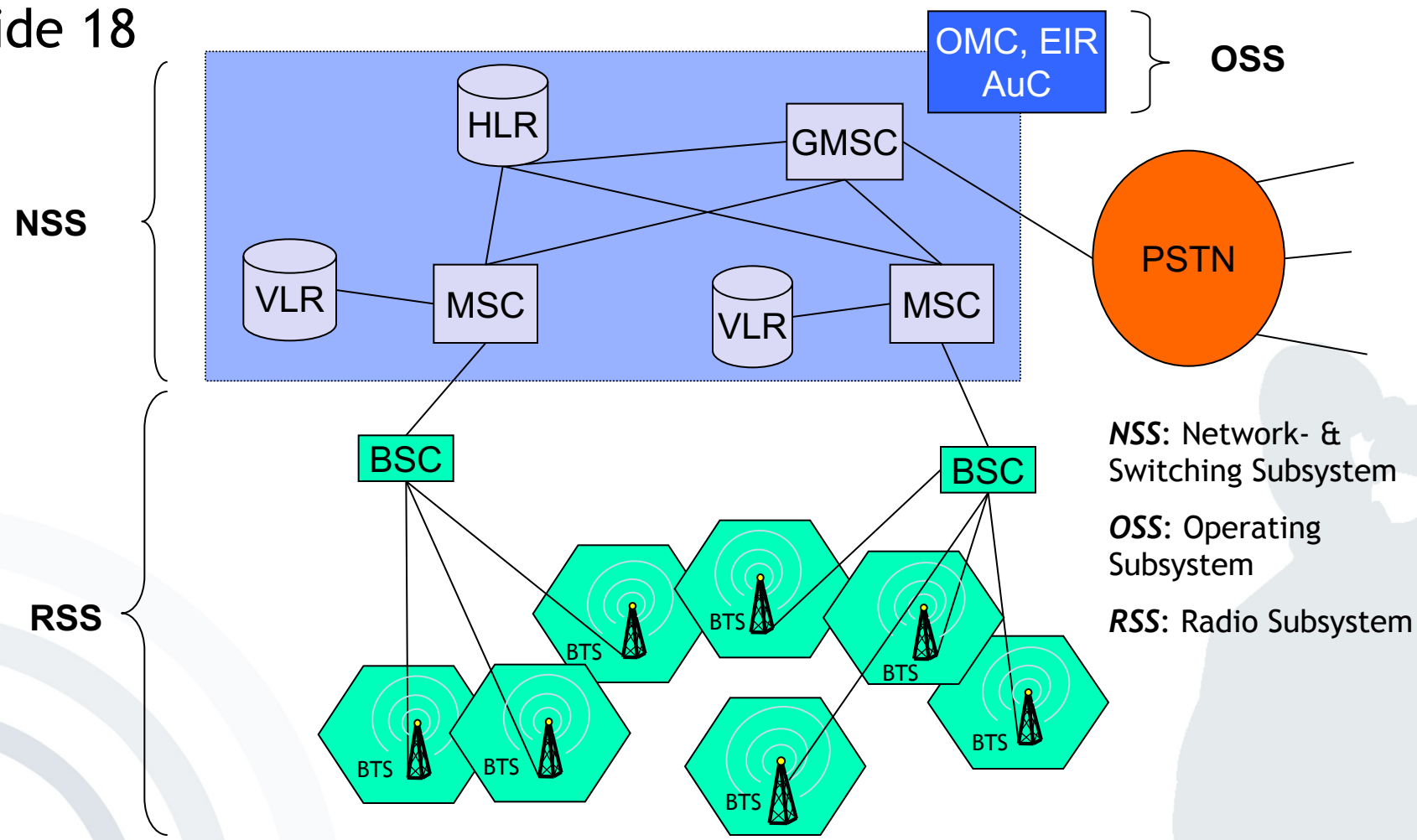
Adresse „m-chair.de“?



GSM-Architektur

- Wäre es möglich nochmal auf die Aufgaben der Komponenten vom GSM einzugehen → was ist Hauptaufgabe von OMC, EIR, AuC (OSS), NSS, RSS etc. wie hängen diese zusammen?

Vorlesung 6
Slide 18



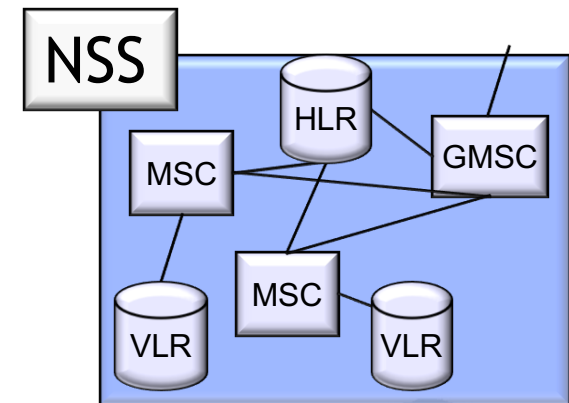
NSS: Network- & Switching Subsystem
OSS: Operating Subsystem
RSS: Radio Subsystem

Based on [Schiller2003]

Vorlesung 6 Slide 19

- **Network & Switching Subsystem (NSS)**

- Connects radio network with conventional networks
- Locates subscribers and monitors change of location



- **Components:**

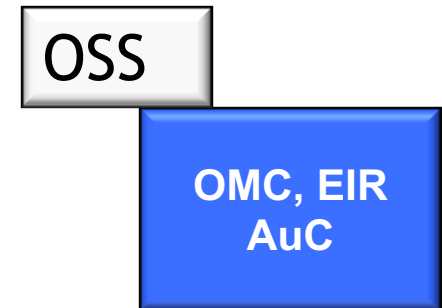
- **Mobile Switching Centre (MSC):** Switching center for initiation, termination and handover of connections
- **Home Location Register (HLR):** Central database with subscribers' data (telephone numbers, keys, locations)
- **Visitor Location Register (VLR):** Database assigned to every MSC with subscribers' data (HLR fraction copy) of active subscribers in the MSC's range
- **Gateway Mobile Switching Center (GMSC):** Terminates the PSTN (Public Switched Telephone Network) signaling and traffic formats and converts this to protocols employed in mobile networks

- **Operation Subsystem (OSS)**

- Supervises operation and maintenance of the whole GSM network

- **Components:**

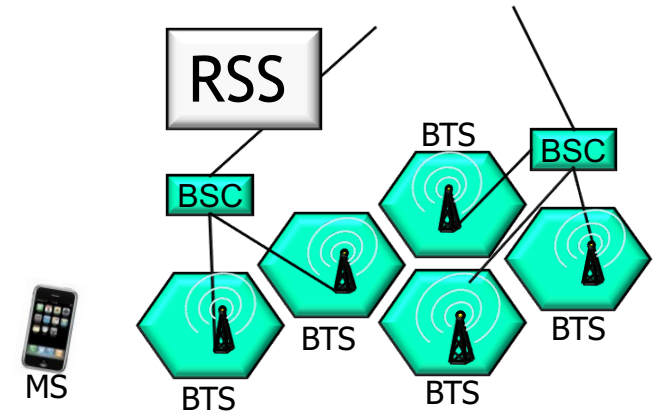
- **Operation and Maintenance Centre (OMC):** Supervises each network component and creates status reports
- **Authentication Centre (AuC):** Protects identity of participants & data transmission, administrates keys
- **Equipment Identity Register (EIR):** Database with identification list for devices, e.g. stolen terminals (whitelist, greylis, blacklist)



- **Radio Subsystem (RSS)**
 - System consisting of radio
 - Specific components

- **Components:**

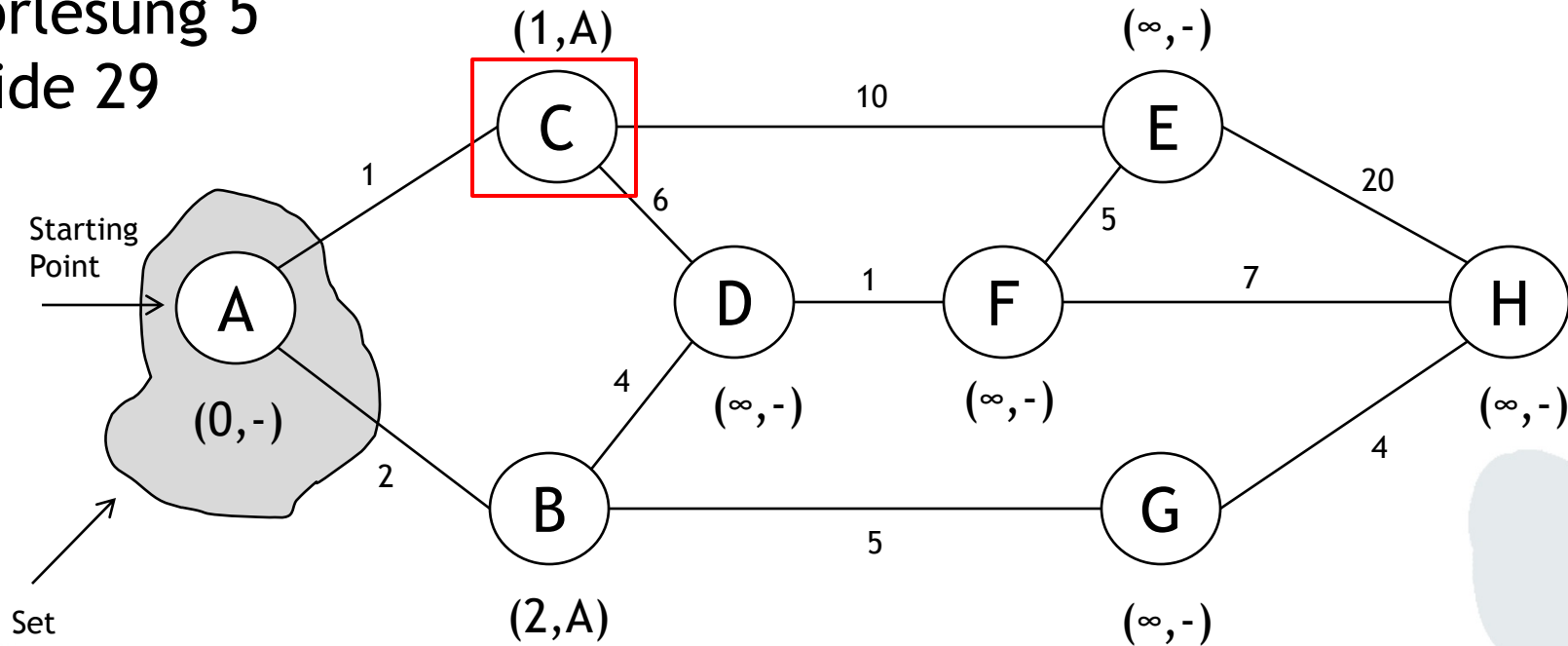
- **Mobile Station (MS):** System of mobile terminal & SIM
- **Base Transceiver Station (BTS):** Radio facility for signal transfer. A BTS serves one GSM cell (~100m to ~30km radius).
- **Base Station Controller (BSC):** Administrates affiliated BTS and supervises e.g. frequency allocation and connection handover between cells.



Dijkstra-Algorithmus

- Warum sind so viele Schritte notwendig?
- Wieso muss man auch die ineffizienten Wege aufschreiben?

Vorlesung 5
Slide 29



- Add last selected vertex to the set: A
- If shorter, update distance and predecessor values of the neighbours of the last selected vertex: B and C
- Select the vertex, which is not in the set and has the minimum value: C

XML

- Könnten Sie nochmal erklären was die Aufgabe von XML- Dokumenten ist

- XML is a text-based format for information exchange, e.g. between software applications, that is both human-readable and machine-readable.

XML

- Ist es in XML erlaubt, dass Textinhalte zwischen zwei öffnenden Tags stehen?

- Elements containing different types of subelements are called “mixed content”:

```
<letterBody> <salutation>Dear Mr.<name>Robert mith</name>.</salutation>  
Your order of <quantity>1</quantity> <productName>Baby  
Monitor</productName> shipped from our warehouse on  
<shipDate>1999-05-21</shipDate>. ....  
</letterBody>
```

Netzplantechnik

- Ich habe eine Frage bzgl. Übung 4, Aufgabe 3: Wie berechnet man "Latest start time"? Besonders bei Aufgabe 3 C wo es "Slack time" gibt?
- Bzw. warum gibt es überhaupt Unterschiede zwischen Earliest start time und Latest start time?

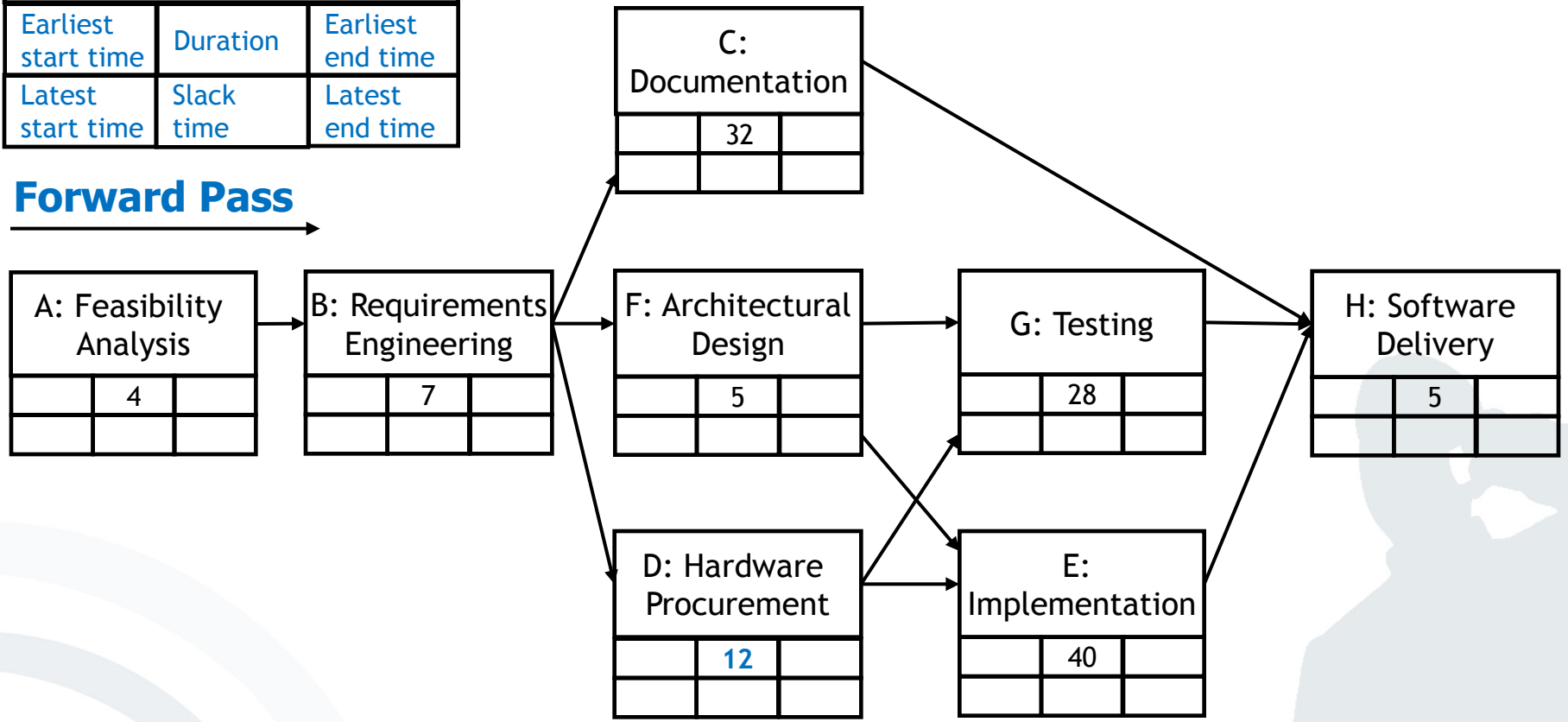
- c) Because of some internal problems with the procurement process, the project manager now expects activity D to require 12 days. Rebuild the network plan, highlight the critical path and describe the impact on the project schedule.

Activity ID	Activity Description	Duration (days)	Preceding Activities
A	Feasibility Analysis	4	-
B	Requirements Engineering	7	{A}
C	Documentation	32	{B}
D	Hardware Procurement	12	{B}
E	Implementation	40	{D, F}
F	Architectural Design	5	{B}
G	Testing	28	{D, F}
H	Software Delivery	5	{C, E, G}

Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

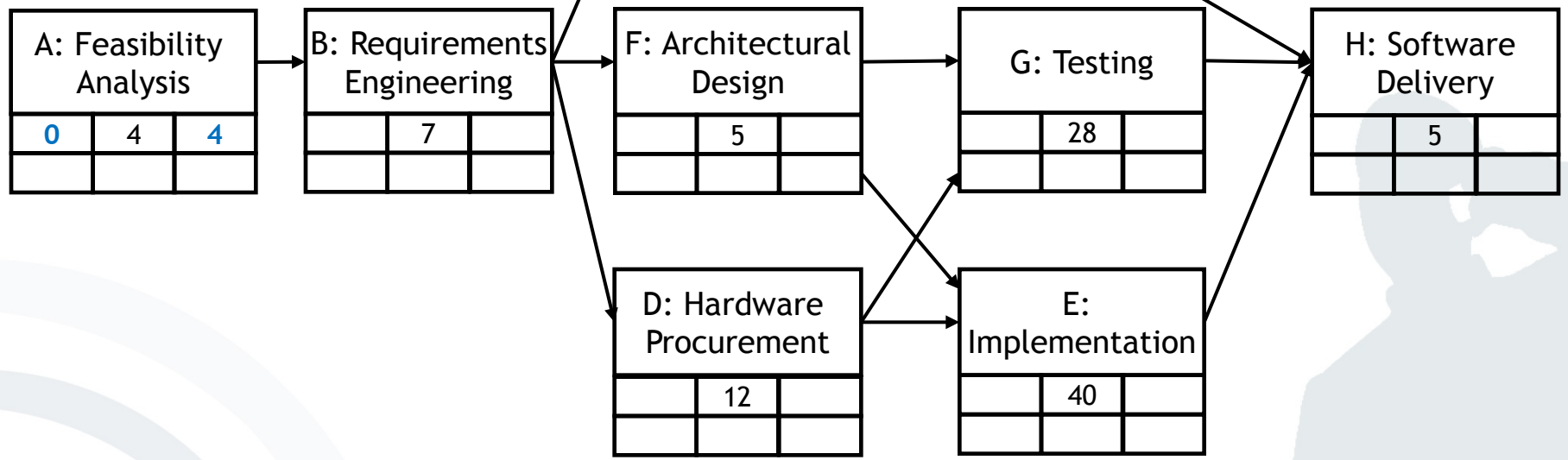
Forward Pass →



Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

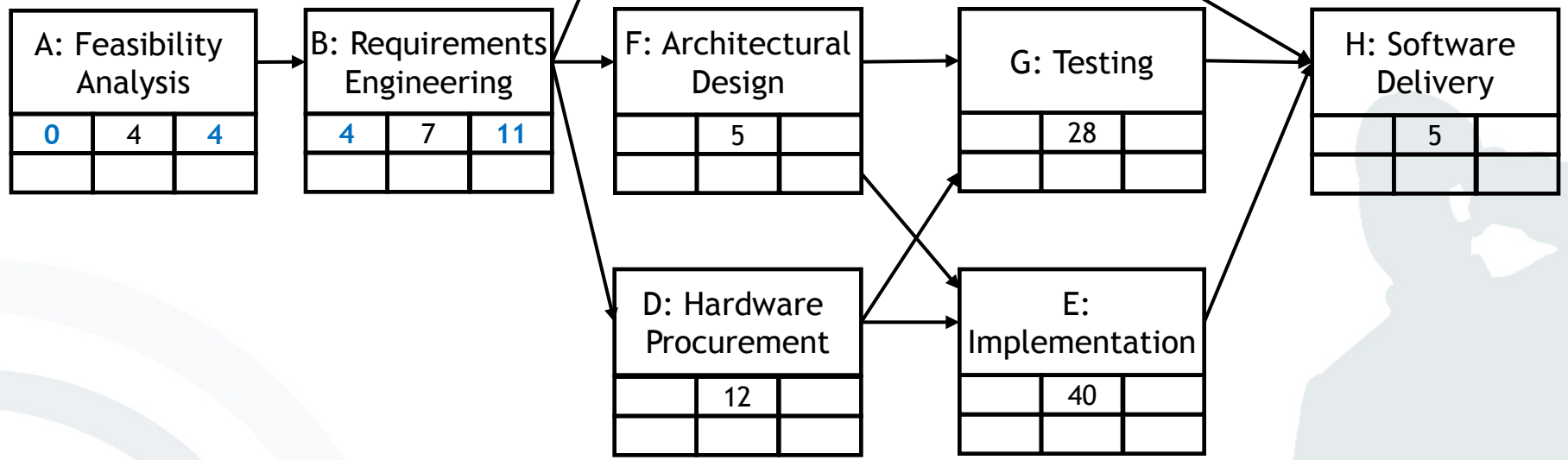
Forward Pass →



Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

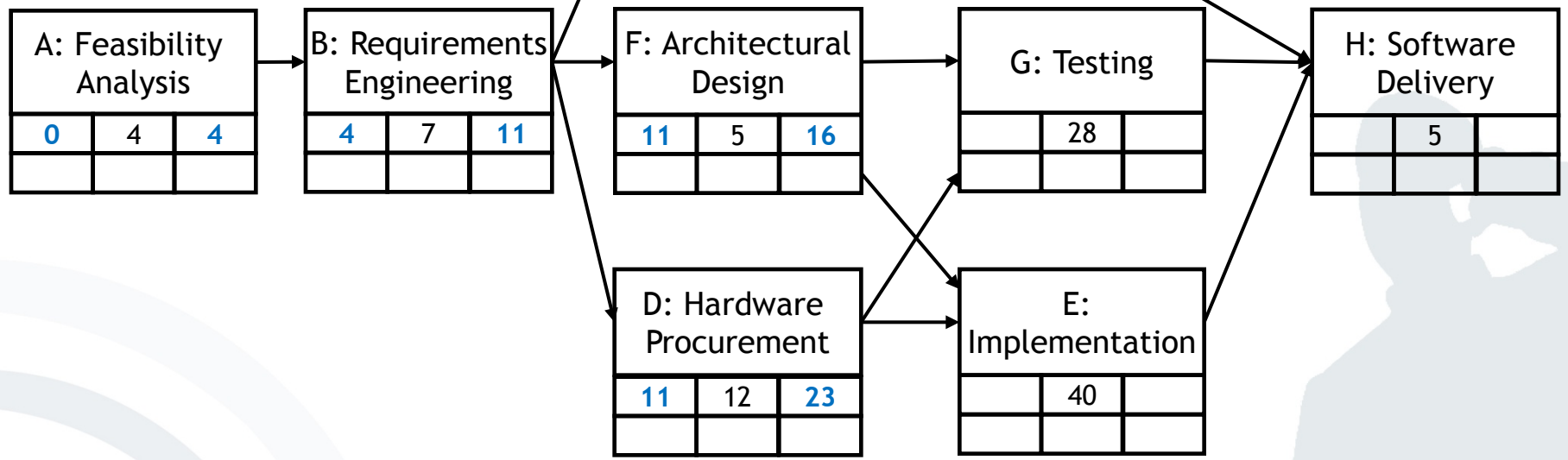
Forward Pass



Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

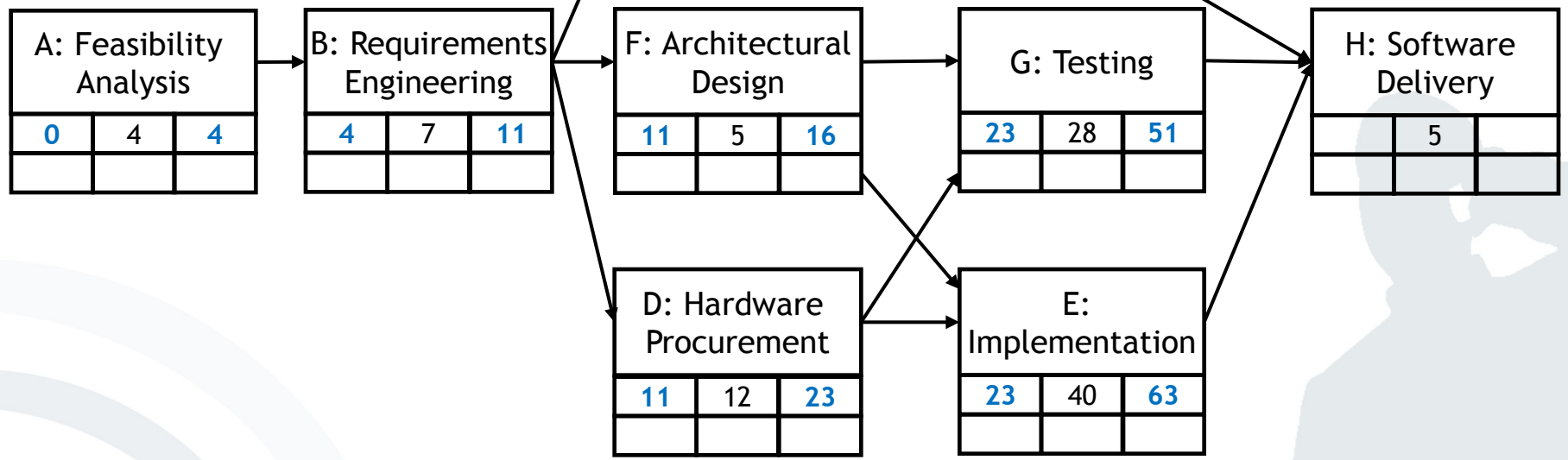
Forward Pass



Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

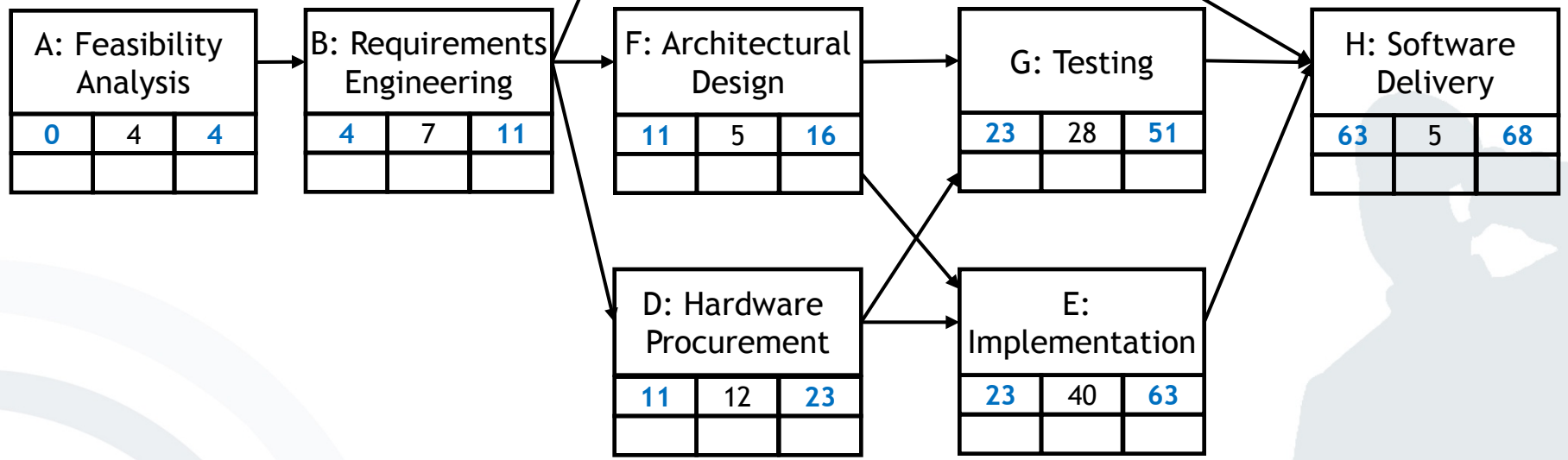
Forward Pass



Exercise 3c): Network Plan and Gantt Chart

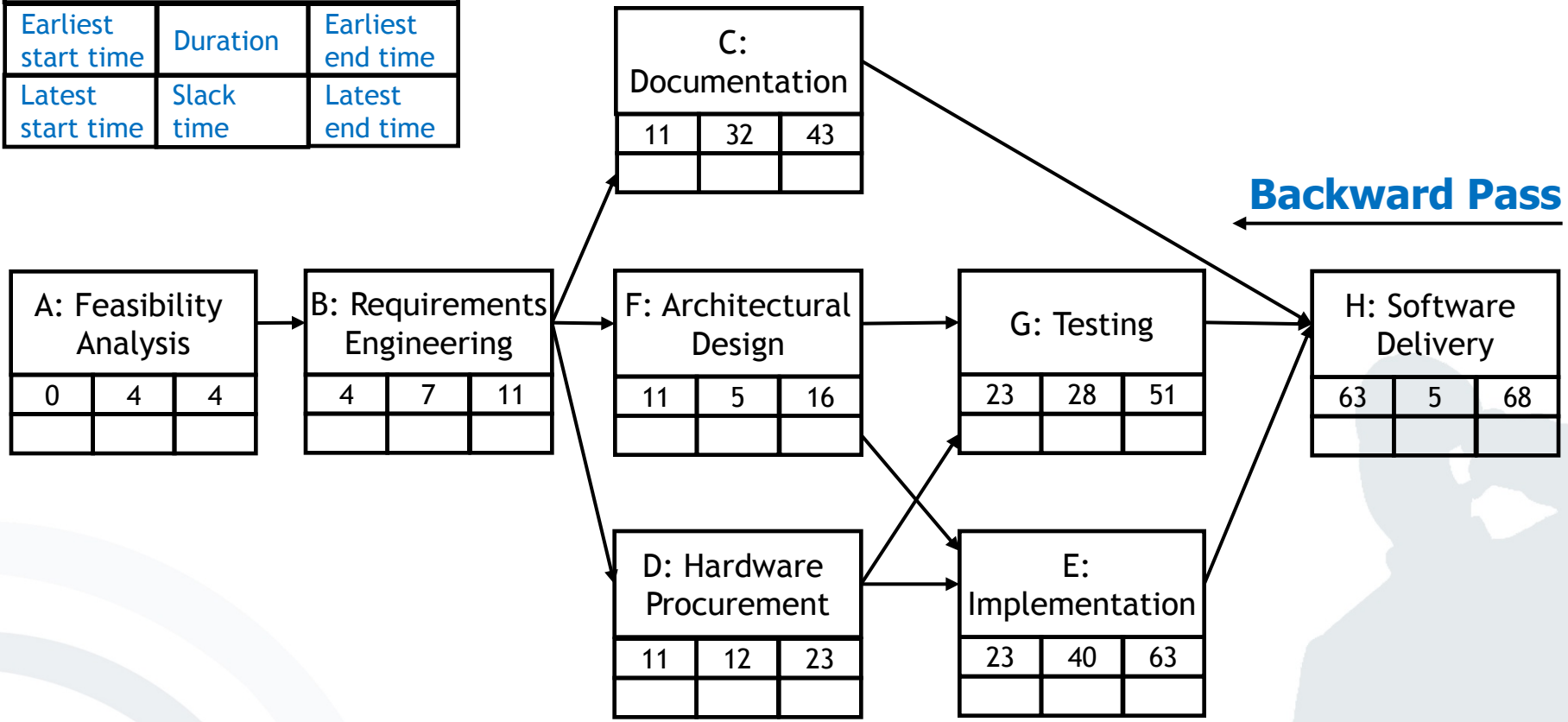
Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

Forward Pass →



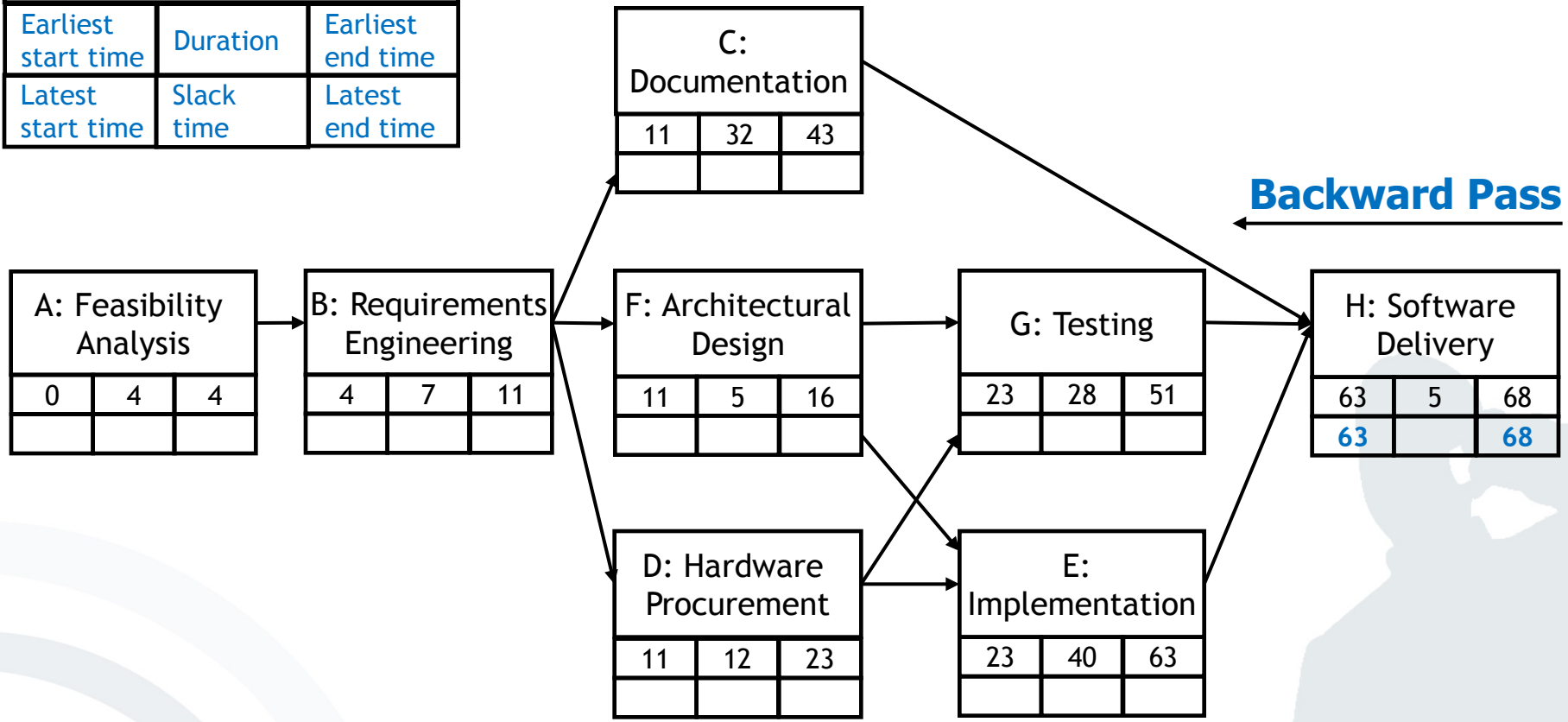
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



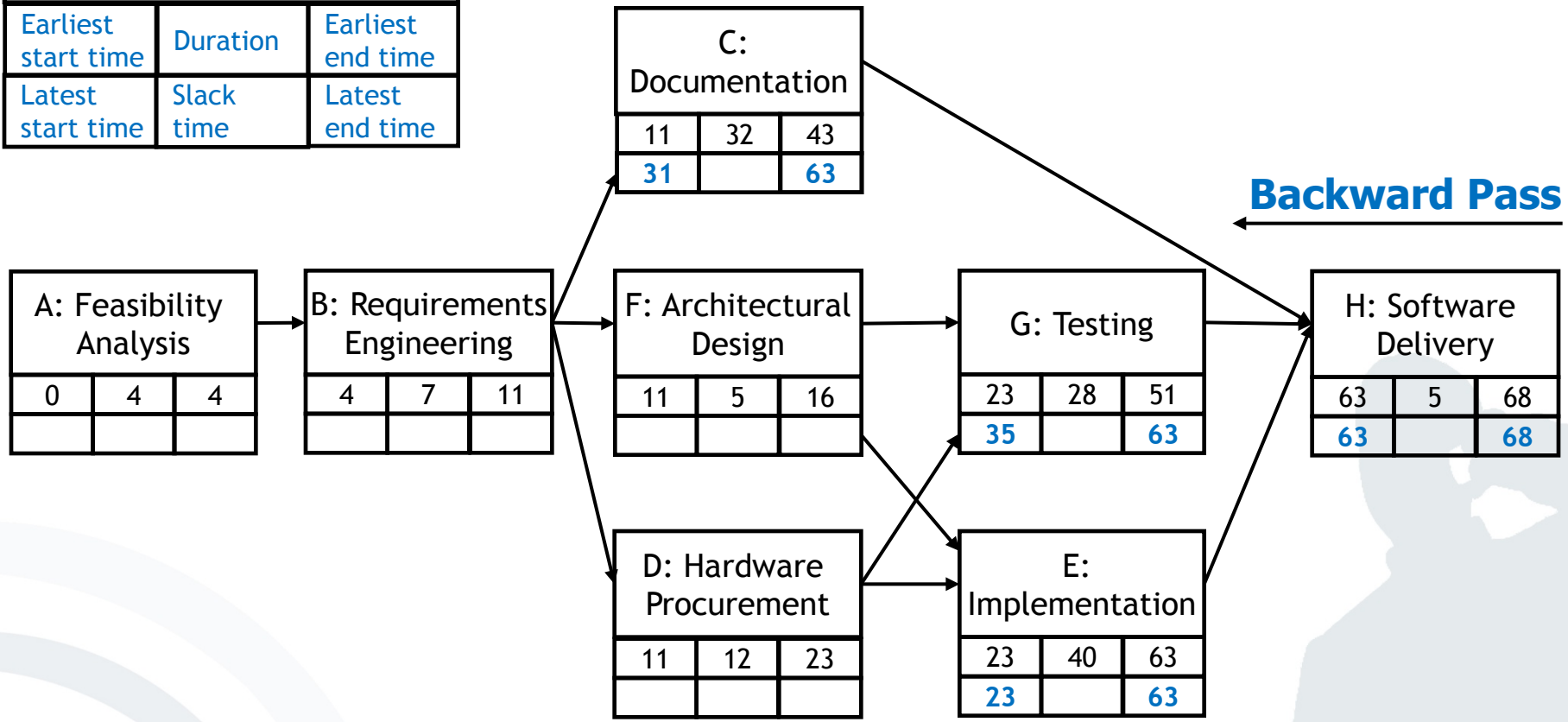
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



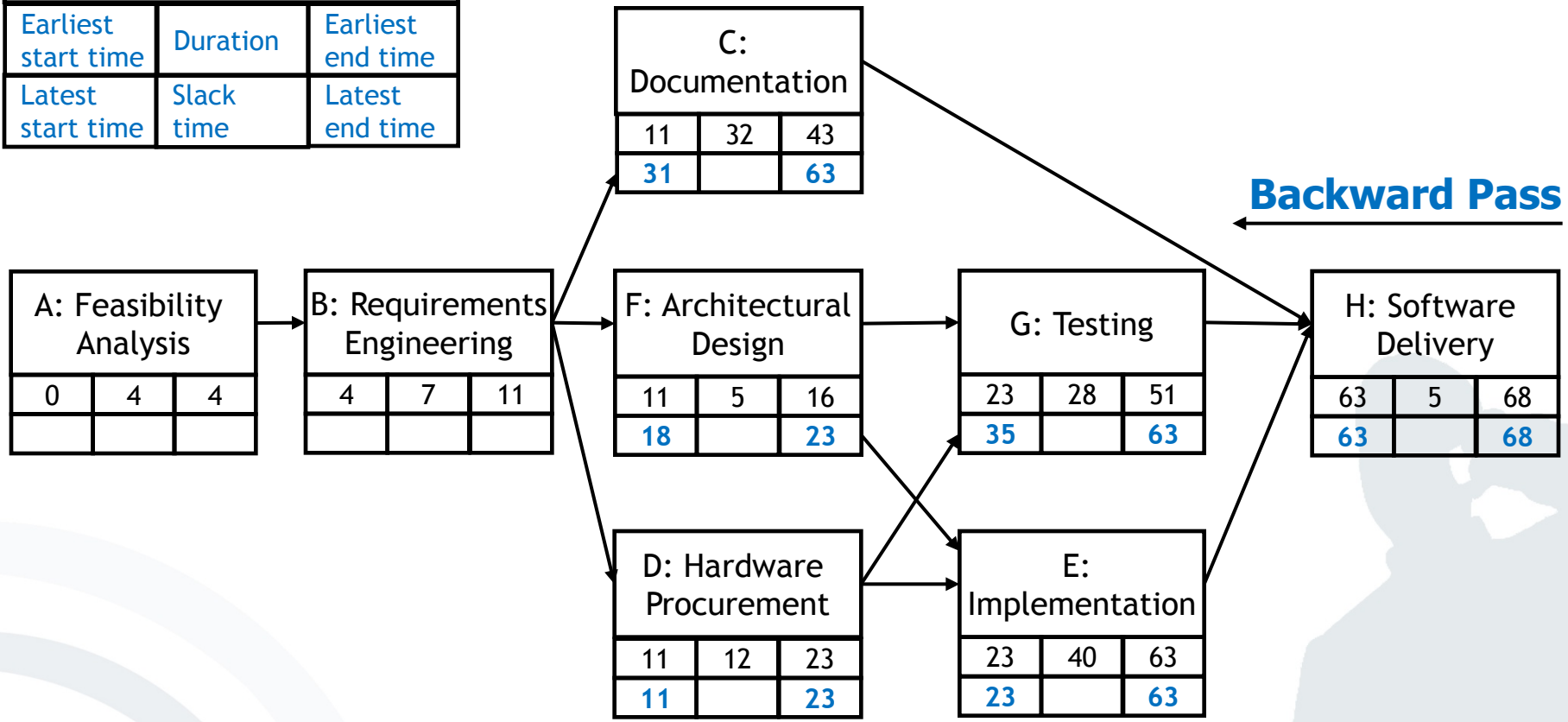
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



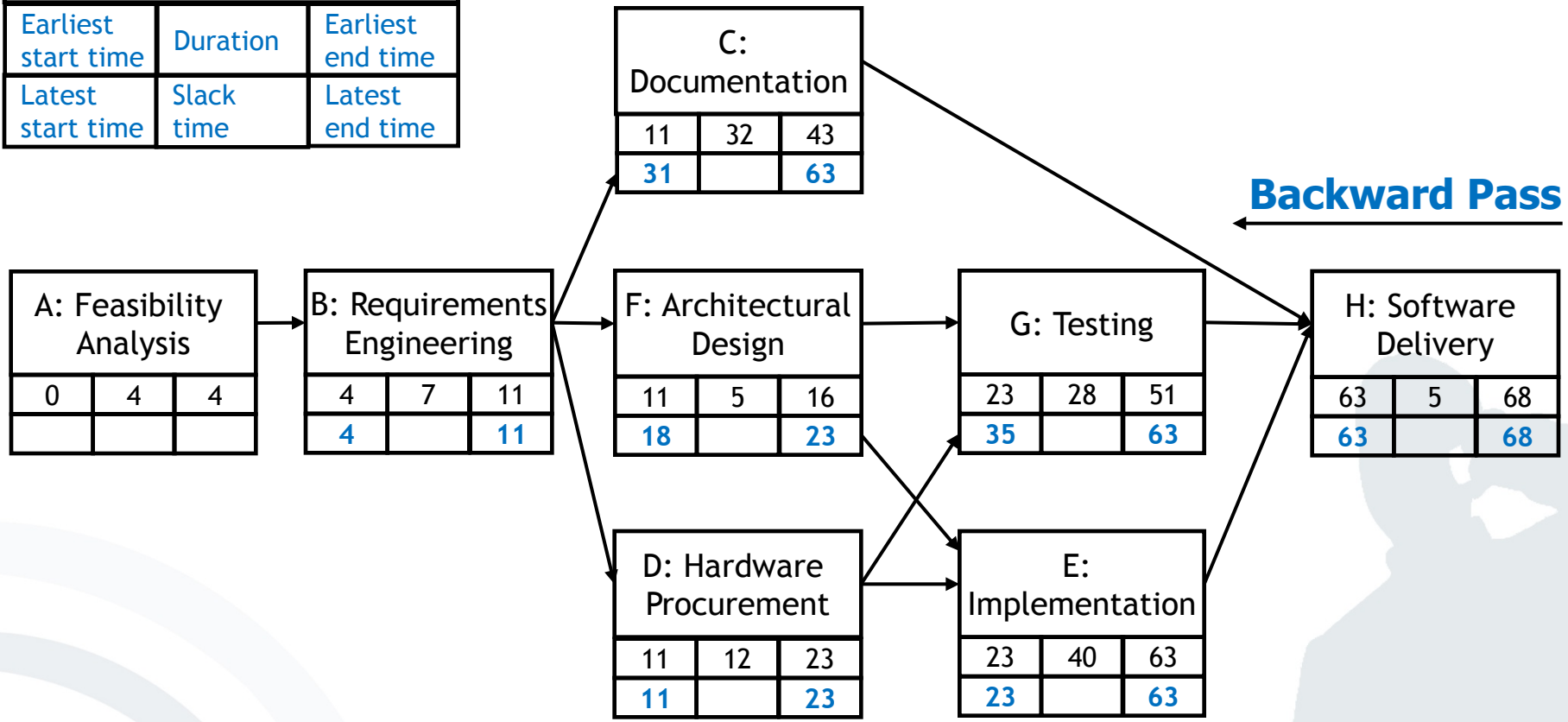
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



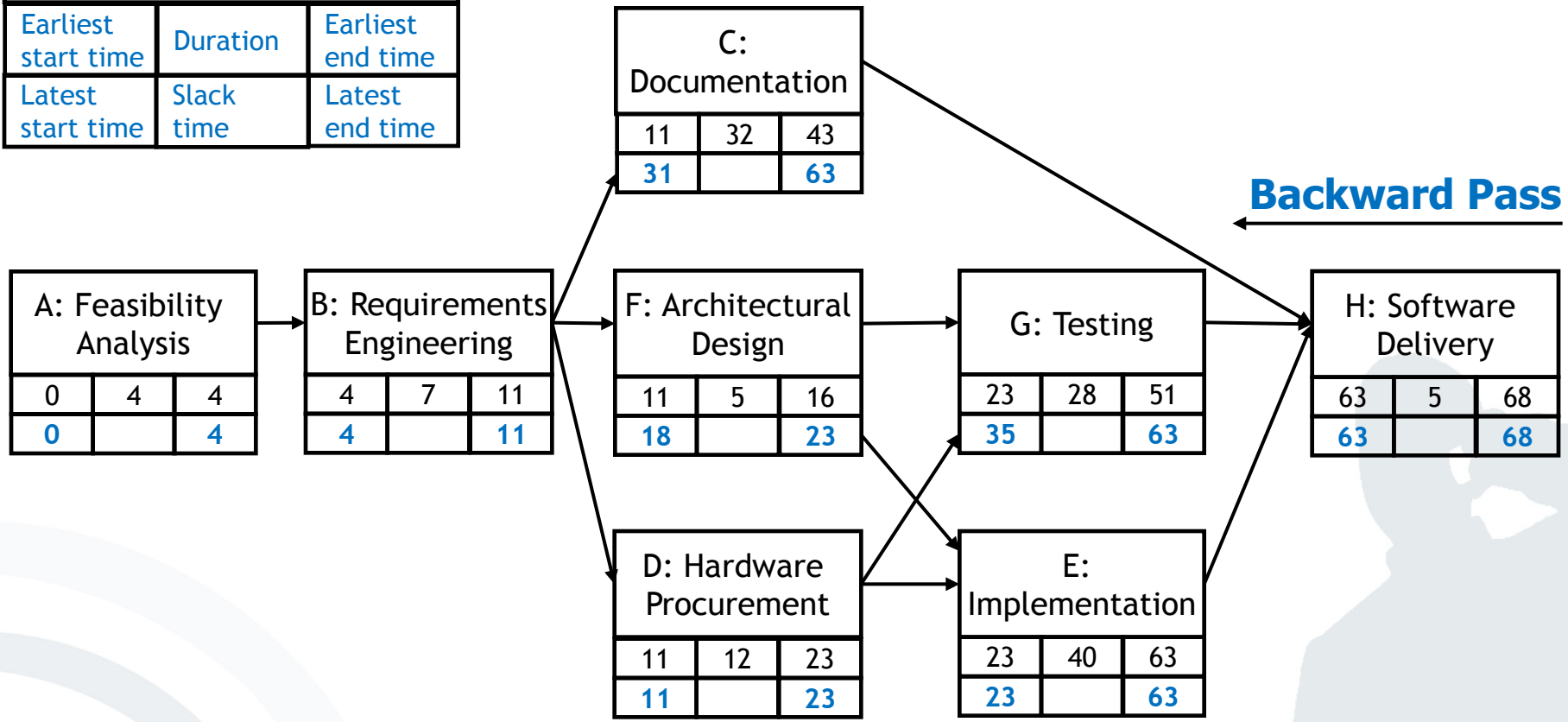
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



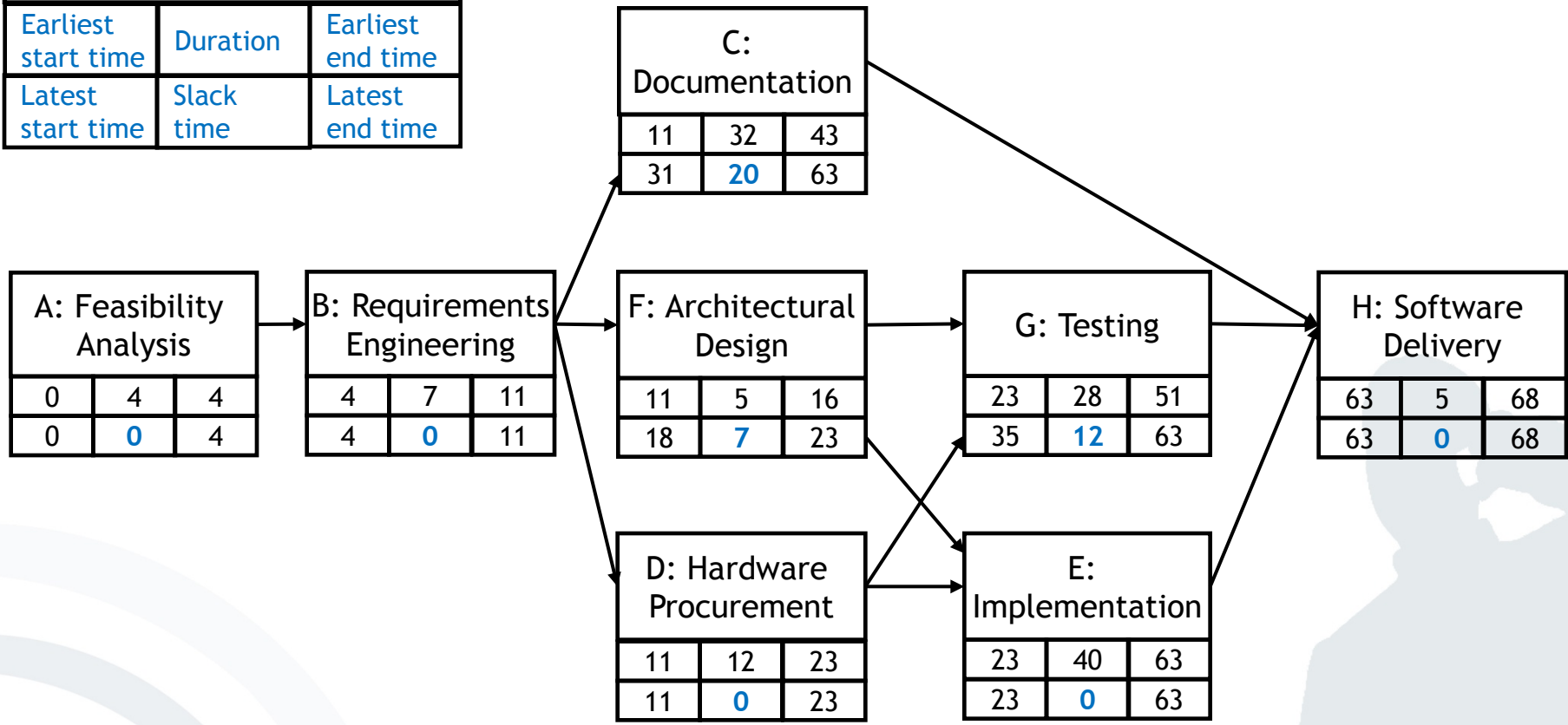
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



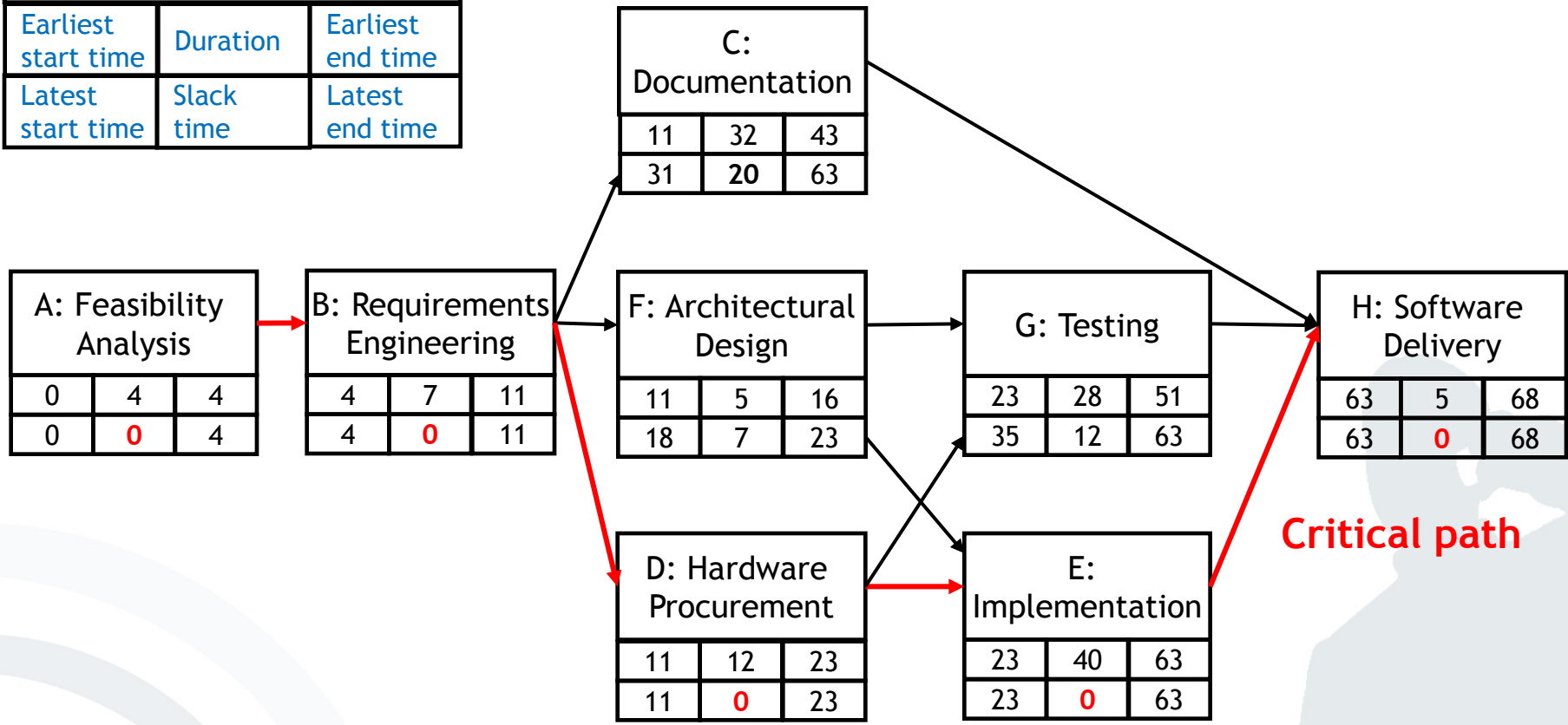
Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



Exercise 3c): Network Plan and Gantt Chart

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time



Critical path

Good luck on your exams!

