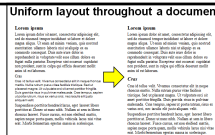


Understanding functionality and structure

- Aim
 - Design scaffolds for understanding IT use
 - Complete Assignment 2
- Core literature:
 - Chapter 4. Understanding IT
- Additional literature
 - Aharoni, D. (2000) Cogito, ergo sum! Cognitive processes of students dealing with data structures
 - Furuta, T. (2000) The Impact of Generating Spontaneous Descriptions on Mental Model Development
 - Vessey & Conger (1994) Requirement Specification: Learning Object, Process, and Data Methodologies

1

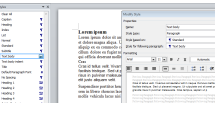
Module for Understanding



Uniform layout throughout a document

1. Introduction

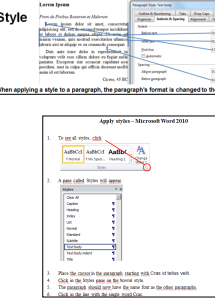
- a. Usefulness of the learning objectives. Slide + demo
- b. Explanation of new functionality/structure



A style is a collection of all formatting instructions for a paragraph.

2. Practical hands-on exercises

- a. Exercise 1: follow instructions
- b. Exercises 2 and 3: somewhat different from the instructions



Apply style - Microsoft Word 2010

1. To get it into USB

2. To get it into USB

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100. To get it into USB

3. Summary

- a. Multiple choice question on new functionality/structure
- b. Discuss functionality/structure and confront misconceptions
- c. Discuss usefulness

Quiz

A style is a ...

- a. document which looks good.
- b. collection of formatting for a document.
- c. common set of formatting for all paragraphs
- d. collection of formatting for a paragraph.
- e. sequence of characters of the same shape.
- f. uniformly looking document

2

Understanding in addition to skills

Learning IT never ends

- New functionality
- New installations of software
- New versions of software
- New vendors
- New software types
- New hardware

Understanding ease learning compared to skills only

Understanding functionality and structure of IT necessary for IT competence

3

Type the Column letter. **Skill**
 Type the Row number.

Carry out an action and say each step.

In order to have one cell refer to another, one has to get the coordinates of the other cell into the formula

Functional understanding
Talk about the input and output of the action without actually doing it.

Cell-referencing is an ingredient in formulas

Structural understanding
Refer to the action like an object of its own which can be part of other actions

4



Exercise

- When requested to explain graphs in spreadsheets, we get the following responses:
 - Gloria:
 - Graphs are drawings of numbers. They show us the numbers so that they are easier to compare.
 - Jussi:
 - The graphs are linked to the numbers, so when I change a number, the graph will also change.
 - Yma:
 - First we select the numbers to be charted, and then choose the graph type. We can change the format of the graph afterwards.
- At which levels of skills or understanding of IT are Gloria, Jussi and Yma?

5

Functional model

– scaffold for achieving functional understanding

Input: Database + more records in another file

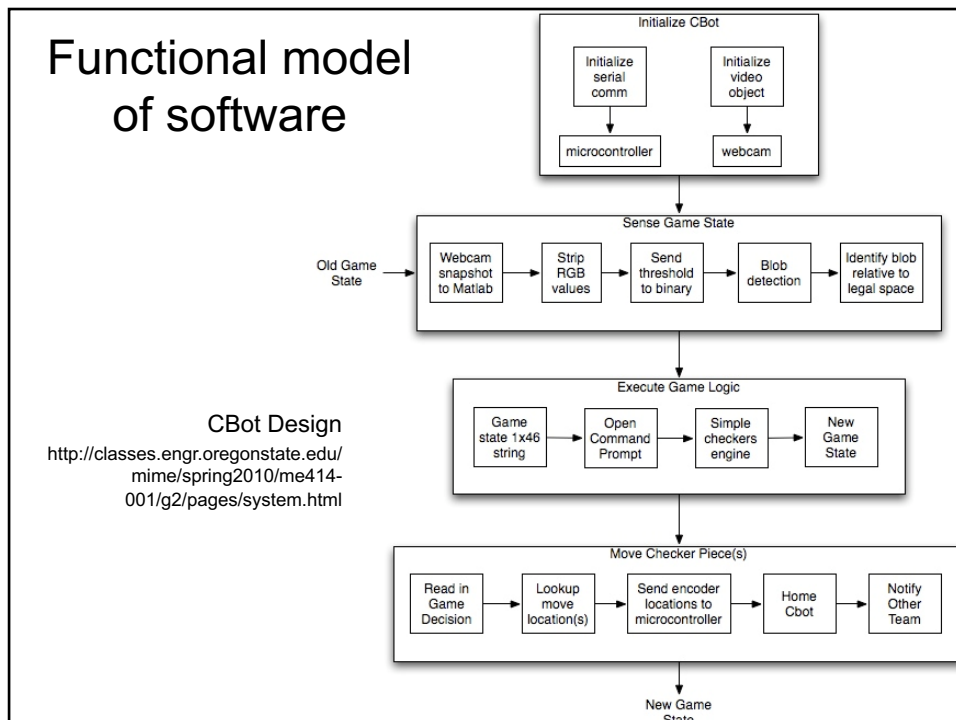
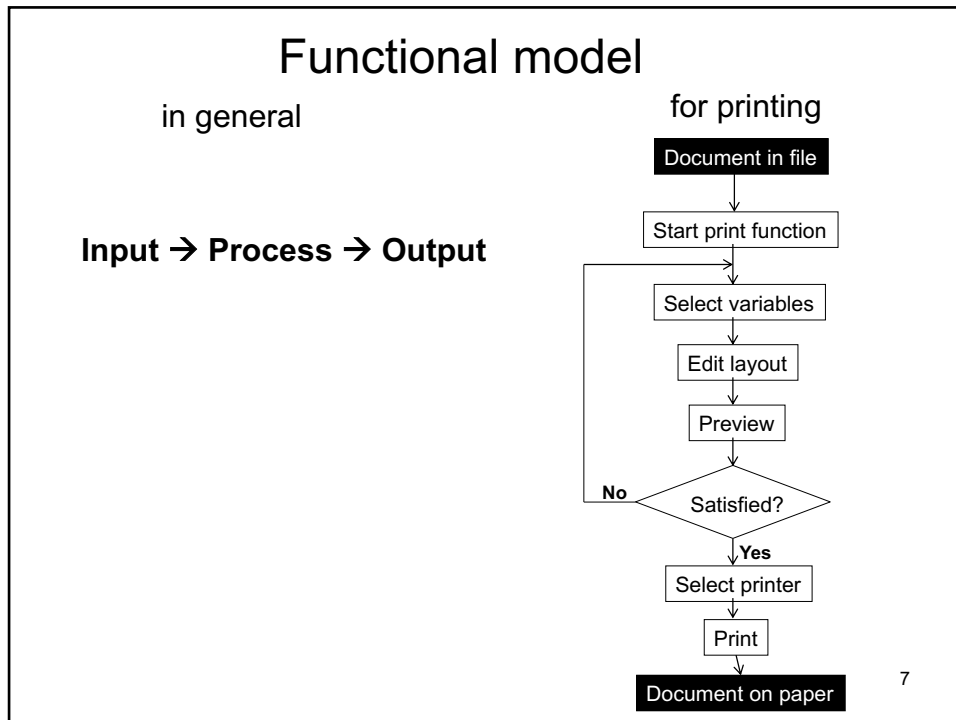
1. Backup the database.
2. Locate file with records to be imported.
3. Specify column containing record identification.
4. Import.
5. Repeat
 1. Check records with similar but not identical identification.
 2. Judge whether the records concern the same object.
 3. Merge if they do

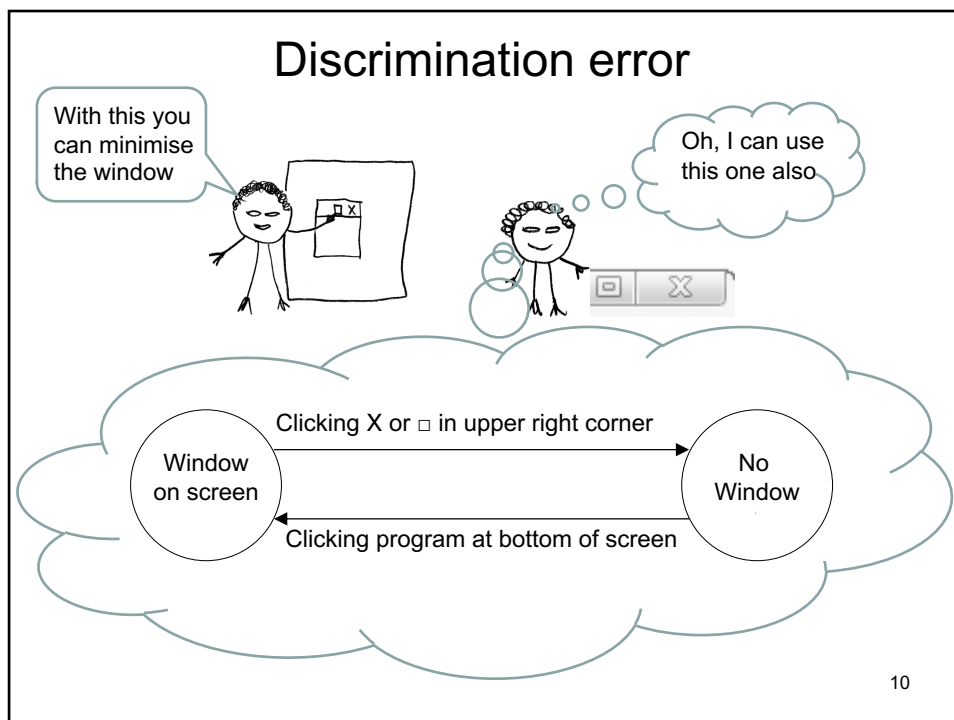
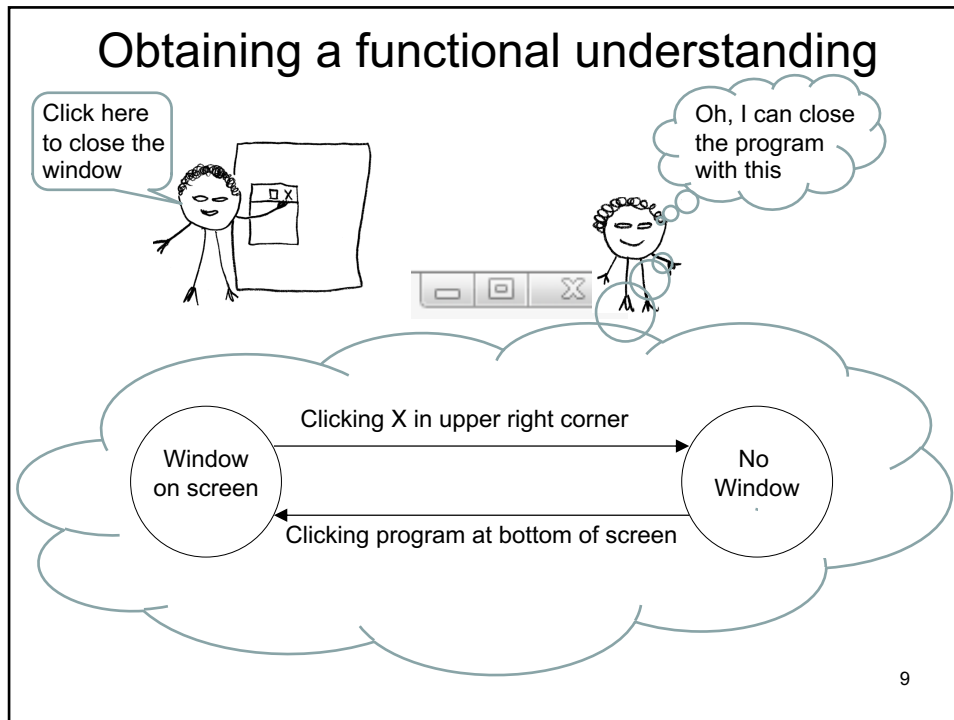
Output: Database with records from other file, duplications removed

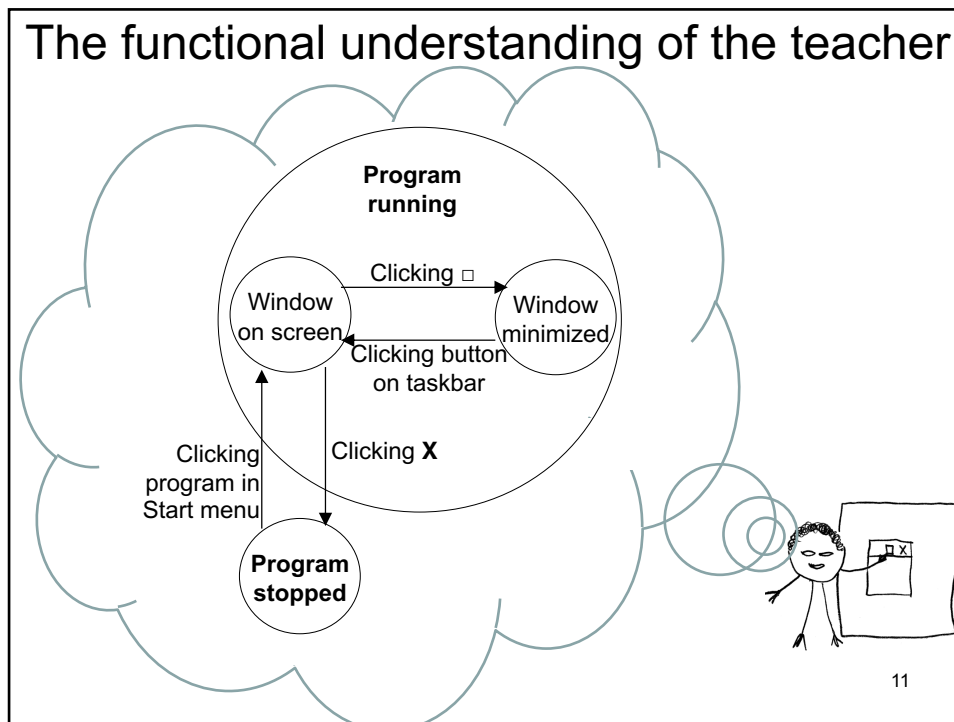
No user interface details

6









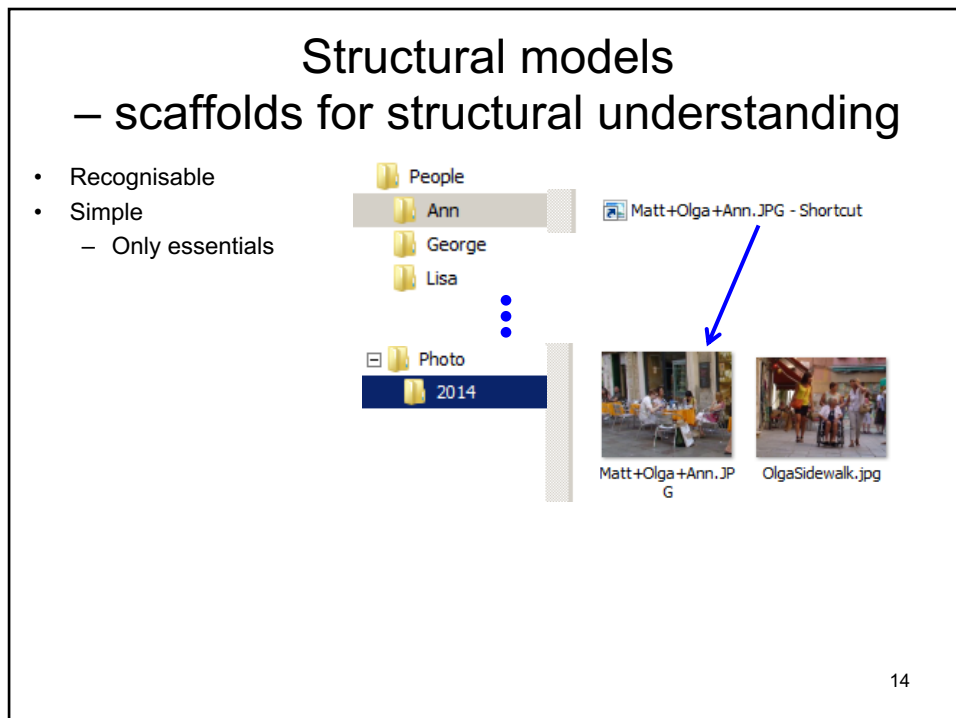
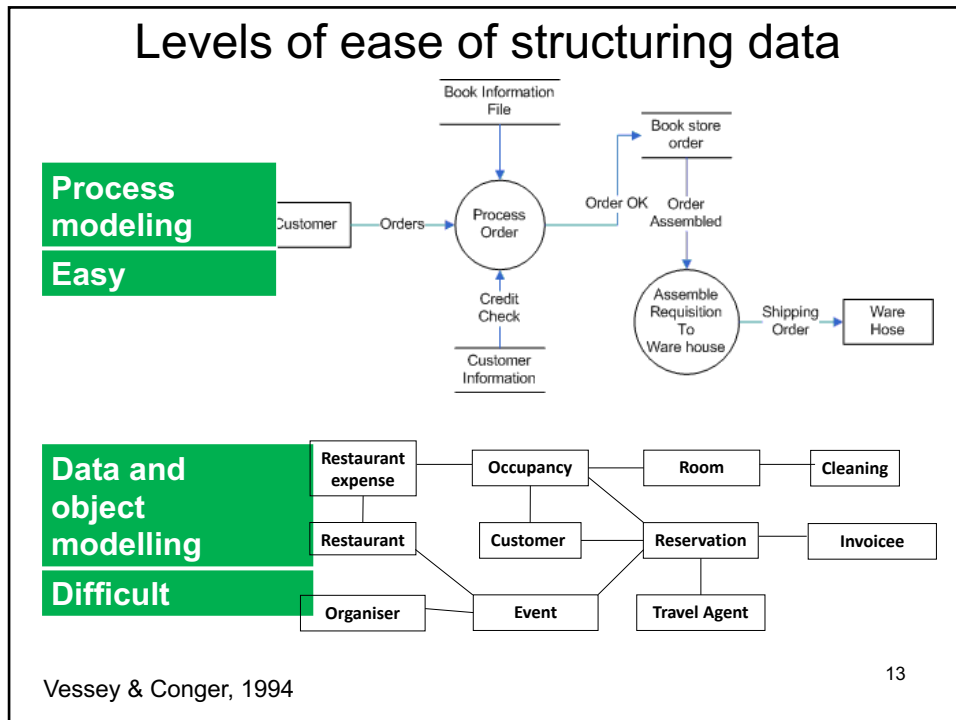
Confronting misconceptions

I just completed the form, and now it's lost! See, the Data Set Report from August is empty. The internet must be down.

No, you see, data is not available in the reports until tomorrow. DHIS has to process them during the night.

Oral

12



Data structures

- 1-many relationship between customer and address
 - Not explicitly stated

Restrictions on values

Add an address

Full Name:

Address Line1: Street address, P.O. box, company name, c/o

Address Line2: Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP:

Country:

15

Making structural models

1. Find the data structures

- Outline views

Slides Outline

4 Representation system

 - Semantics
 - Coupling a domain to
 - Meaning
 - Syntax
 - Symbols
 - Rules for combining
 - Combined symbols
- Data models
- Deduce from user interface

Add an address

Full Name:

Address Line1: Street address, P.O. box, company name, c/o

Address Line2: Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP:

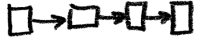



Country:

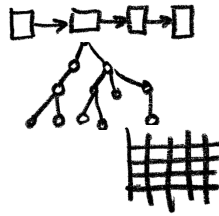
16



Making structural models

2. Decide main and sub structure types

-  • Sequence
-  • Grid (array, matrix)
-  • Hierarchy
-  • Network



Combinations?

17

Making structural models

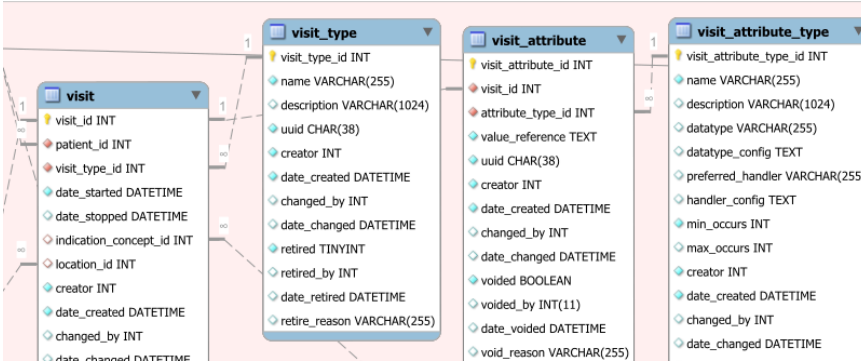
3. Decide user group

- Most users
 - Entering and reporting → Only data
- Superusers
 - Setting up data structures → Include types

Visit

Visit-ID
Patient
Visit-type

18





Making structural models

4. Include abstract entities

- **Events** in the Domain represented by a record

Occupancy
From date
nights
guests
- **Planned events**

Reservation
From date
nights
guests
Room type

19

Making structural models

5. Include examples

- In the model

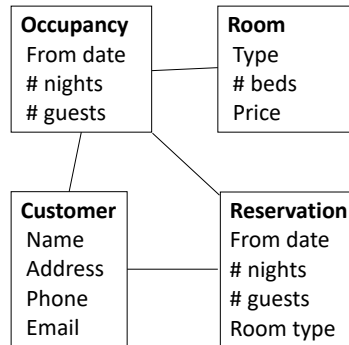
Customer
Name: Fjoralba
Address: Oslo
Phone: 123456
Email: fj@mail.com

Reservation
From date: 24.03.14
nights: 3
guests: 2
Room type: Luxe
- Relate to recognisable places in the user interface

New reservation	
Name	Fjoralba
# guests	2
From	24 March 2014
# nights	2
Room type	Luxe

20

Structural models for intermediate level users



Types and Instances

Type

- Description of a common set of symbols and operations

Integer
Number without decimals
Calculation operators

Instances

- A unit of data adhering to the type

234 -2 1 000 000

Class

Account
Balance
Owner
Deposit
Withdraw

22

Objects

:Account
18 473.32
Kari
:Account
3 292.00
Ola



Obtaining a structural understanding

You know recipes for making food?

And knitting patterns and sweaters?

Yes, I normally follow patterns.

Syles and paragraphs are similar. Styles determine the layout of paragraphs.

Sure.

23

Structural model of IT – Generalisation-specialisation

```

graph TD
    A[Data link] --> B[Specialisations]
    B --> C["Cross reference  
- inside a document"]
    B --> D["Hyperlink  
- between files"]
    
```

24

Graphics

- Recognisable
- Simple
 - Only essentials

~~Folder consists of Files and Links and~~

Unknown notation Recognisable

25

Graphics Functional and Structural model of IT – Discrimination

Inconsistencies when updating the spreadsheet Inconsistencies avoided

26



Graphics

Avoid codes

Place related contents next to each other

1 Section formatted as a single column

2 Section formatted as two columns

Microsoft Help
Word > Page breaks and section breaks
> Insert a section break

27

Graphics

Make sure that symbols denoting different things vary in shape and colour

Hyperlink

28

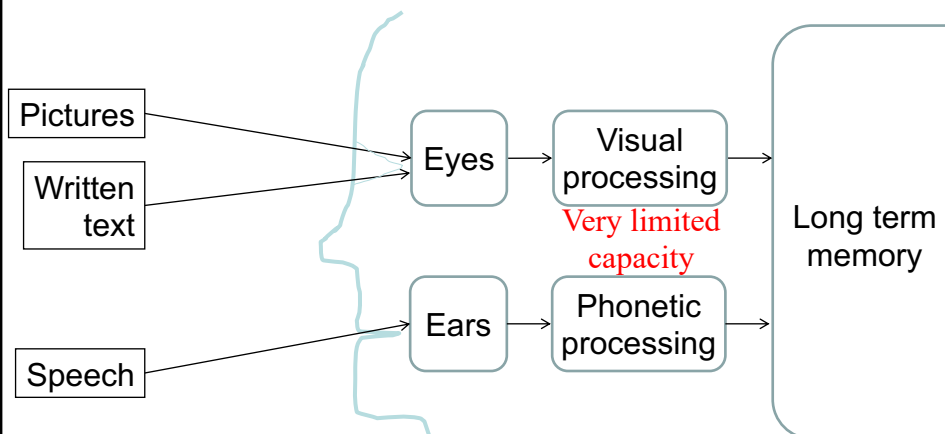
Video

- Make learners feel being in a conversation
 - We and you
 - Learning agent
 - Natural voice
- Describe complex visuals with audio only



29

Exploiting both the visual and oral channels



- Teaching and videos
 - Minimum of written text

30

Testing understanding

Questioning the learners

- What is a ...
- What is the result of ...
- What is the difference between ...

A style is a ...

- a. document which looks good.
- b. collection of formatting for a document.
- c. common set of formatting for all paragraphs.
- d. collection of formatting for a paragraph.
- e. sequence of characters of the same shape.
- f. uniformly looking document.

Not

- How do you ...
- Where do we find ...

31

Summary



What do we mean by

- Functional understanding?
- Structural understanding?

3. Provide functional and structural models and confront misconceptions.

32

Which types of learning material does
this tutorial consist of?

→ [The basics of Excel formulas](#)

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