VK Multimedia Information Systems

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Agenda

- Topics & goals
- Modalities & examination
- Schedule

- What is **information**?
- What are **information systems**?
- The information overload
- Current state in MuMe consumption

C.V.

- Technische Mathematik an der TU Graz
- Doktoratsstudium Telematik

- 98-01 Entwicklung von Web-Applikationen
- 01-06 Know-Center in Graz (KPlus)
- 05-06 Ass. am KMI / TU Graz
- 06-14 Ass. am ITEC / Uni Klagenfurt
- 14- .. Assoc. Prof. ITEC / Uni Klagenfurt

Course Topics

Multimedia Databases

Multimedia Management

Social Media Sharing

Video Analysis

Metadata

Data Mining

Digital Audio

Information Retrieval

Social Networks

Image Processing

Retrieval Evaluation

Goals I

Basic (and a little more) understanding of

- Multimedia retrieval
- Multimedia analysis
  - images in the spatial domain
  - audio & video processing
- Multimedia databases & meta data

Goals II

- Overview on state of the art
  - who is who in research
  - what to read if I want to know more?
  - available tools in development
  - de facto & de jure standards

Goals III

- Providing a solid base for
  - further research,
  - consulting and
  - practical development
- in the area of
  - multimedia information retrieval
  - multimedia information systems
- and: hands on experience!

Modalities

Multimedia Information Systems ist eine *„prüfungsimmanente Lehrveranstaltung"*

A positive grade is based on

- some few mandatory exercises / readings
- ongoing collaboration
- and a project (implementation & presentation)

Modalities

Projects are

- Practical implementations of MMIS / MIR
- Research work & studies

Projects topics will be

- … assigned after Easter holidays
- … assigned to groups or individual students

Team Work

- Preferably teams of **2** students
- TEAM = „Toll-Ein-Anderer-Machts" ?

Projects

- Topics:
  - Lire SOLR Flickr Indexer
    - Indexing software to fill Lire SOLR
  - Additions to Lire
    - Extension of the existing library, eg. JNI wrappers for OpenCV, face detection based on OpenIMAJ etc.
    - New features like parallel search, extraction based on the GPU
    - SOLR integration, etc.
  - Near duplicate search in PDFs
    - Tracking the use of assets in documents
  - or: Bring along you own Topic

Grades

Grade is derived from:

- 1/3 Exercises
  - Pen & paper
  - Readings
- 1/3 Project
  - Implementation
- 1/3 Presentation

Schedule

- See web page

Questions?

Any questions regarding organizational issues left?

Preliminaries

- What is research?

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What is Information?

Definition of Aamondt and Nygard (1995) :

- Data
- Information
- Knowledge

*Aamodt, A. & Nygard, M. "Different roles and mutual dependencies of data, information, and knowledge - an AI perspective on their integration" Data Knowl. Eng., Elsevier Science Publishers B. V., **1995**, 16, 191-222*

Data
Aamondt und Nygard (1995)

Data are syntactic entities

- Patterns without meaning
- Input to an interpretation process

Example:
- Bits & Bytes of a JPEG encoded image

Information
Aamondt und Nygard (1995)

Information is interpreted data

- Information is data with meaning
- Output from interpretation
- Input to knowledge based process

Example:
- Decoded (and displayed) JPEG image

Knowledge
Aamondt und Nygard (1995)

Knowledge is learned information

- Incorporated in an agents (software / human) reasoning resources
- Ready for active use
- Output of learning process

Example:
- There is a dog shown on the JPEG image

What is Information?

Definition of Zeleny (1987):

- Data

- Information

- Knowledge

- Wisdom

Zeleny, M. "Management Support Systems: Towards Integrated Knowledge Management" Human Systems Management, 1987, 7, 59-70

What is Information?

Image originally published in the December 1982 issue of THE FUTURIST, taken from http://www-personal.si.umich.edu/~nsharma/dikw_origin.htm

The DIKW Hierarchy

Definition of the DIKW levels:

Data	Know nothing
Information	Know what
Knowledge	Know how
Wisdom	Know why

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What are Information Systems?

- Systems for handling information
  - collect, store & organize
  - process, disseminate & transmit
- Three main parts in these systems
  - people,
  - machines &
  - methods

MEMEX

Memory **Ex**tender – Vannevar Bush

- Published in 1945 (Atlantic Monthly)
- An electromechanical device for
  - viewing books and films
  - adding information and comments
  - interlinking information
  - browsing links
- MEMEX is an early hypertext system

Multimedia IS

- Focus on multimedia data & meta data
  - storage, transmission
  - search & retrieval
  - organization & dissemination
- Media types
  - textual / visual / auditive / haptic / olfactory
  - rastered or rendered / modelled
    - Midi vs. MP3
    - VRML vs. PNG
    - LASER vs. MPEG-2

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YouTube

- Over 800 million unique users visit YouTube each month
- Over 4 billion hours of video are watched each month on YouTube
- 72 hours of video are uploaded to YouTube every minute
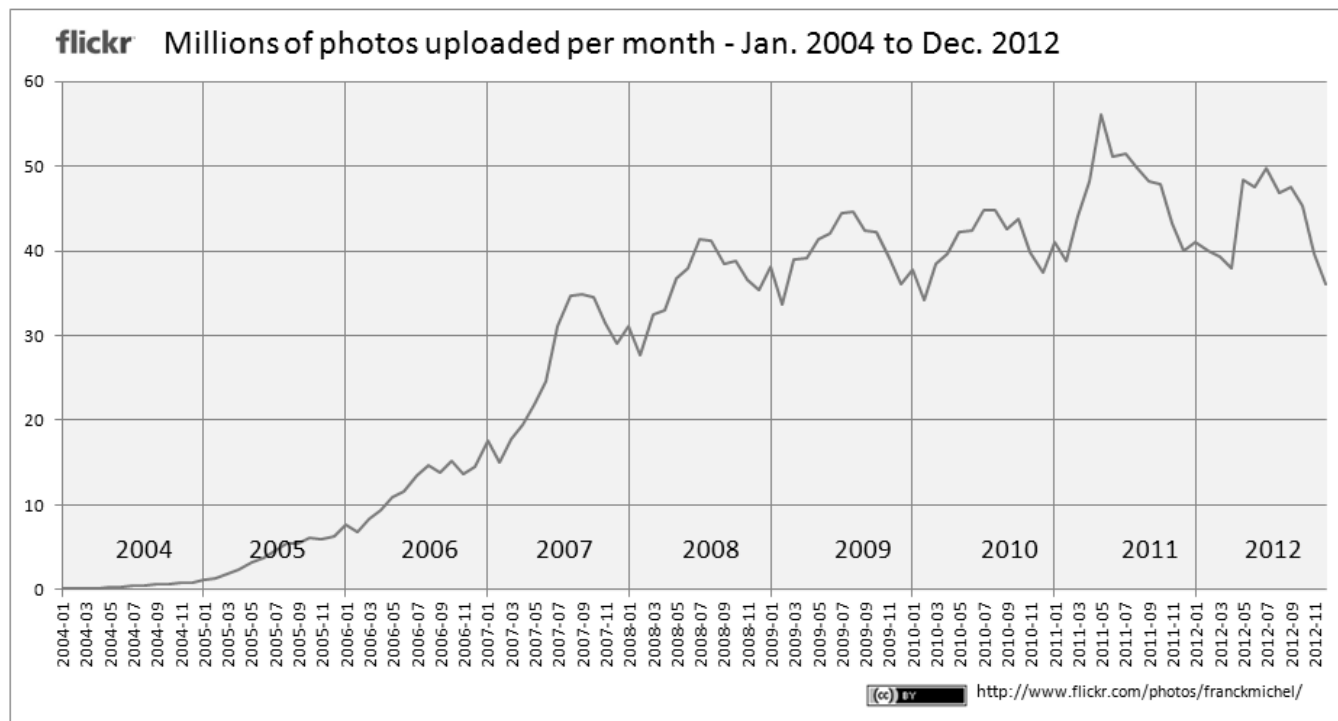- 70% of YouTube traffic comes from outside the US

Source: http://www.youtube.com
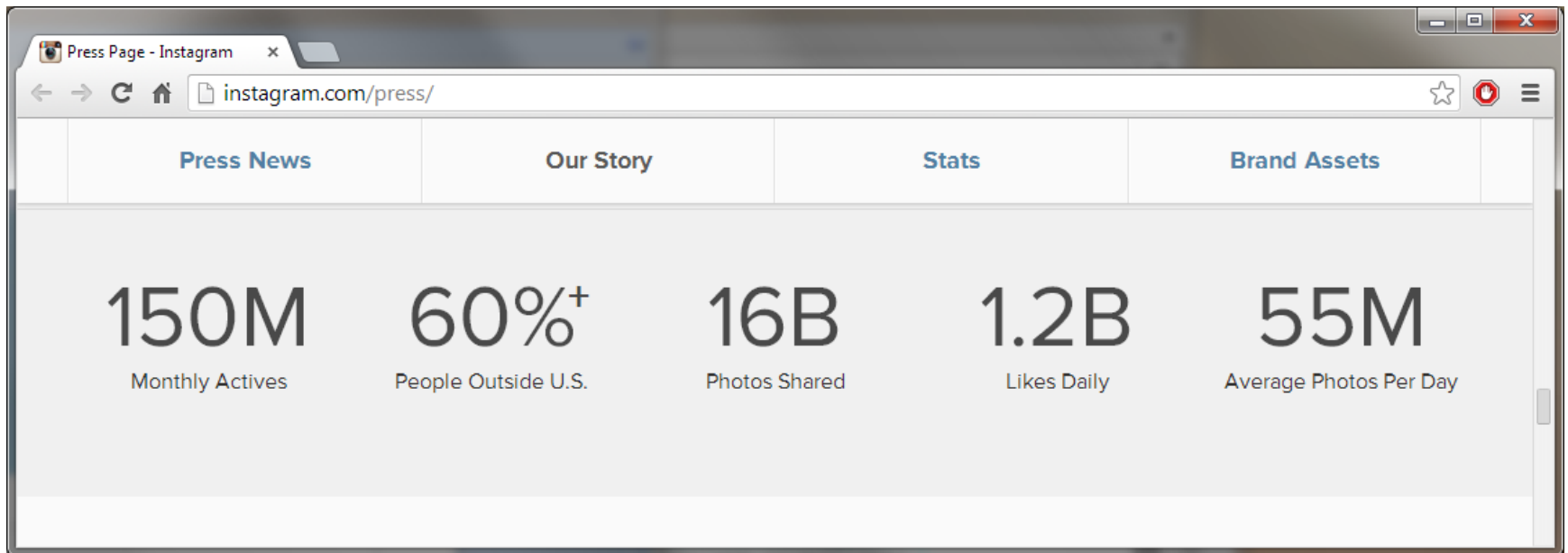
fotocommunity

- Each day
  - 9,300 new photo uploads
  - 60,000 photo reviews (comments)
  - 450 new amateur photographers
- In the data base
  - 170 Million photo reviews (comments)
  - 20 million photos
  - 1,000,000 members

Source: http://www.fotocommunity.net/en/about-us/the-fotocommunities.html

Flickr

How many photos are uploaded to Flickr every day, month, year?

flickr   Millions of photos uploaded per month - Jan. 2004 to Dec. 2012

http://www.flickr.com/photos/franckmichel/

Instagram

Facebook

- Facebook processes more than 500 TB of data daily

- 2.7 billion likes made daily on and off of the Facebook site

- 300 million photos uploaded / day

- 1.1 billion photos uploaded on New Years Day & Eve 2012

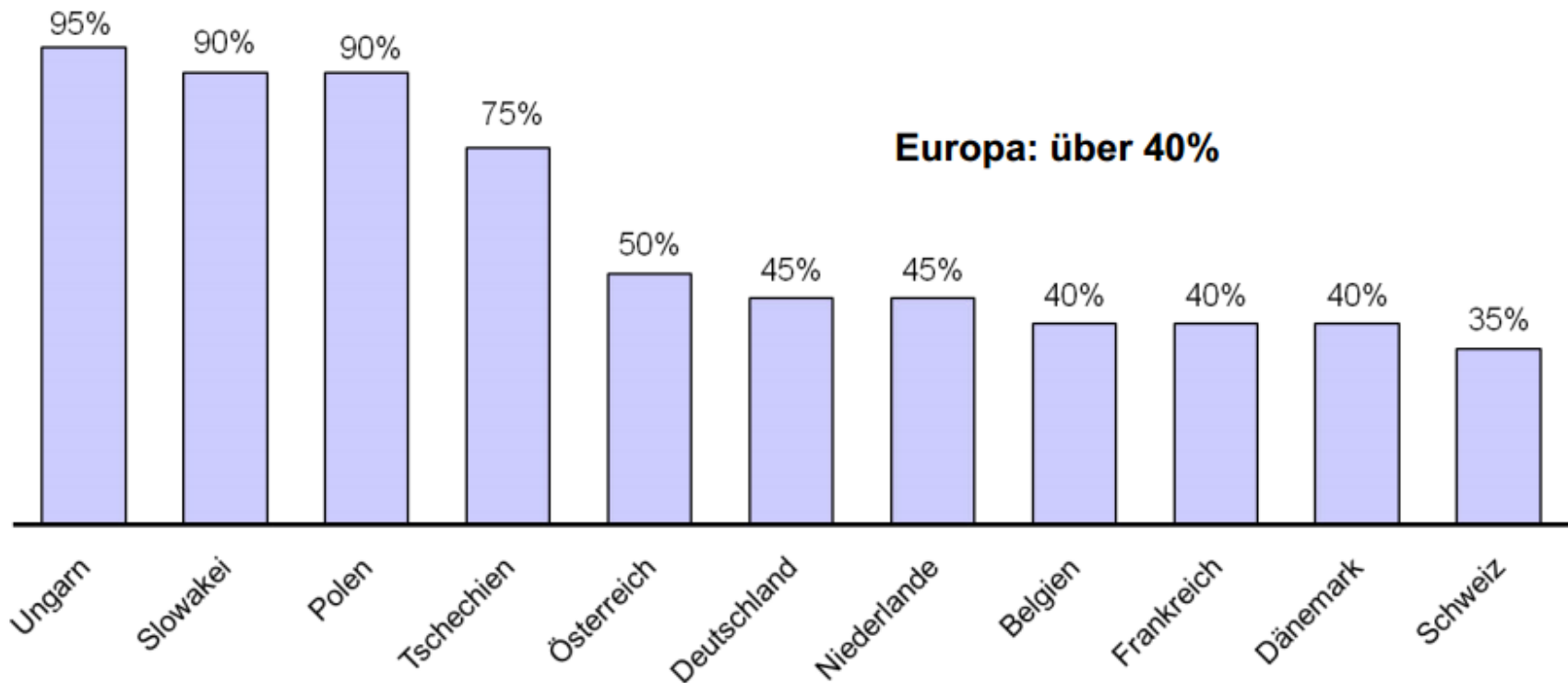- 70,000 queries executed by people and automated systems

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CEWE Color

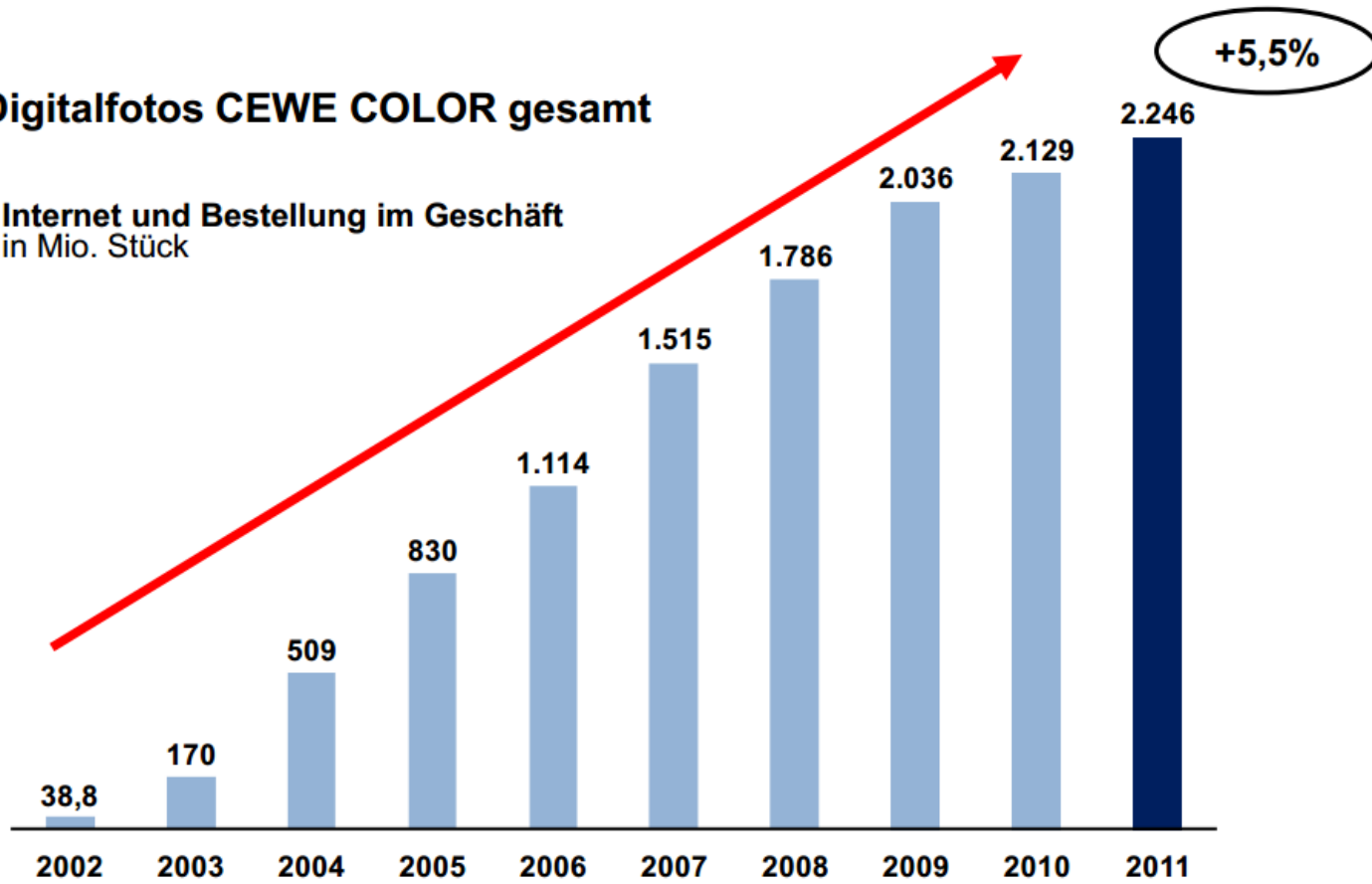**Marktanteile CEWE COLOR**
am industriellen Fotofinishing

Europa: über 40%

Land	Marktanteil
Ungarn	95%
Slowakei	90%
Polen	90%
Tschechien	75%
Österreich	50%
Deutschland	45%
Niederlande	45%
Belgien	40%
Frankreich	40%
Dänemark	40%
Schweiz	35%

CEWE COLOR

Digitalfotos CEWE COLOR gesamt

Internet und Bestellung im Geschäft
in Mio. Stück

+5,5%

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
38,8	170	509	830	1.114	1.515	1.786	2.036	2.129	2.246

CEWE COLOR
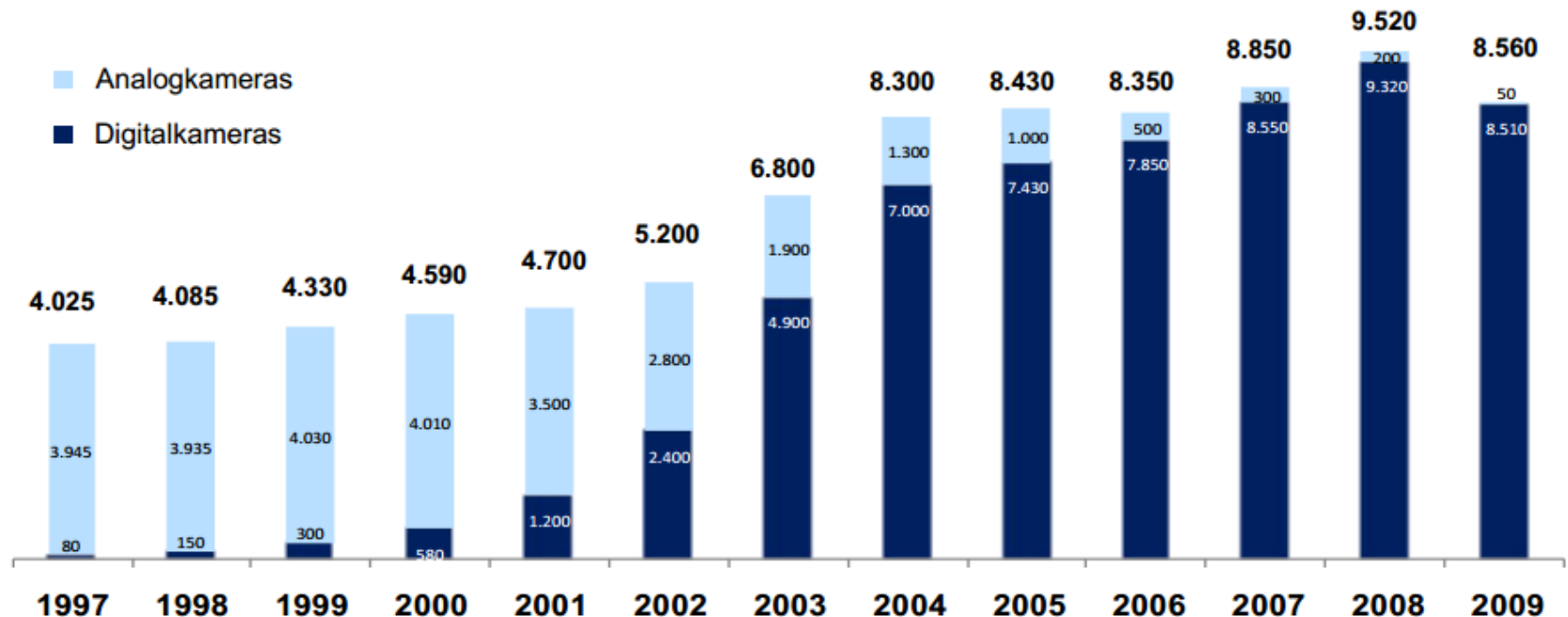
Top Movie Torrents
(isohunt.com / Mar, 2013)

ITEC, Klagenfurt University, Austria – Multimedia Information Systems
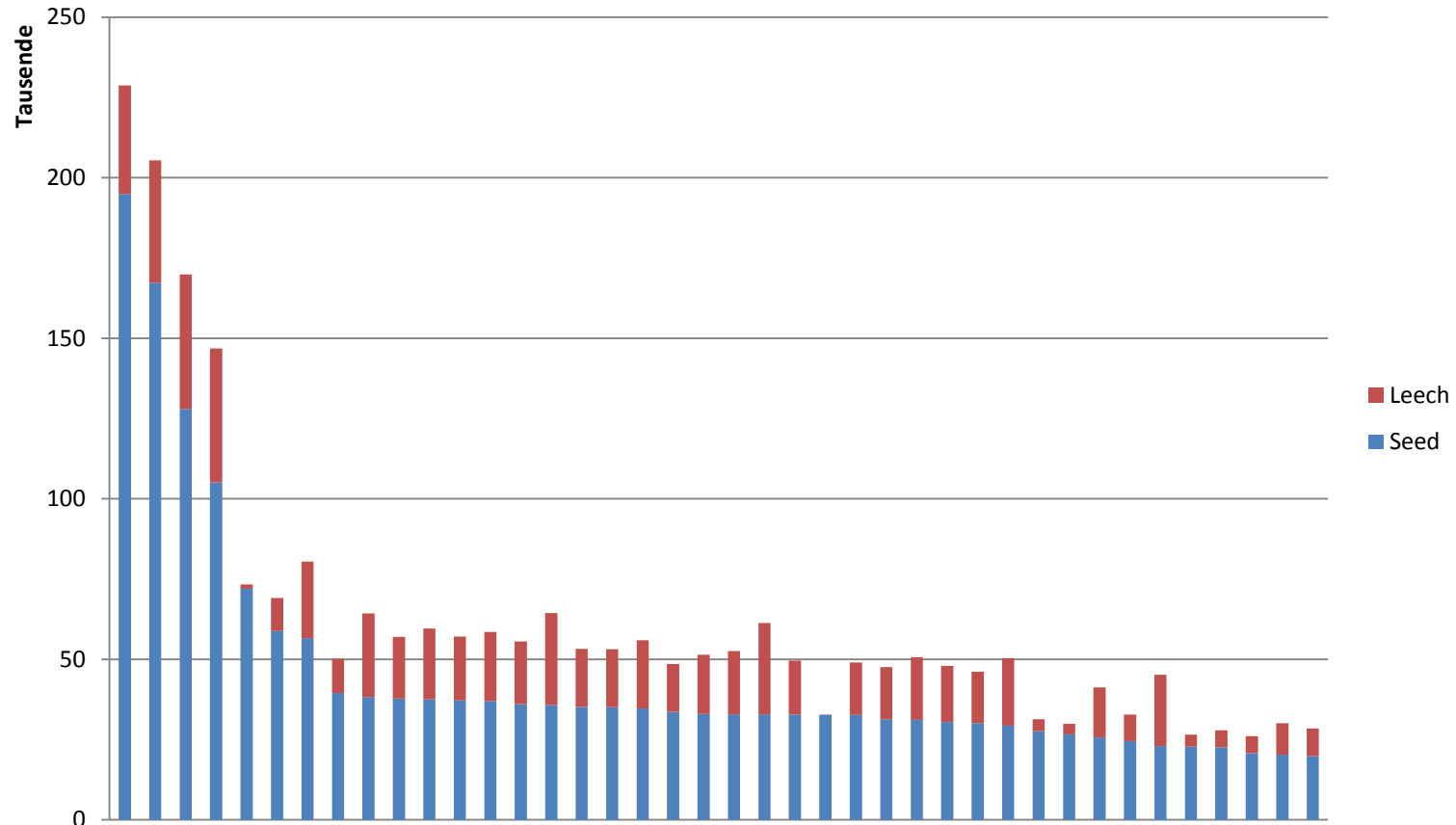
Your Tasks …

- Reading 01: Introduction to Rijsbergen's book
  - Data vs. Information
- Reading 02: Get started with Lire
  - Download the book (7z, pwd "mmis2013_book")
  - Read chapter 1 and use chapter 1.2

Thanks …

… for your attention!