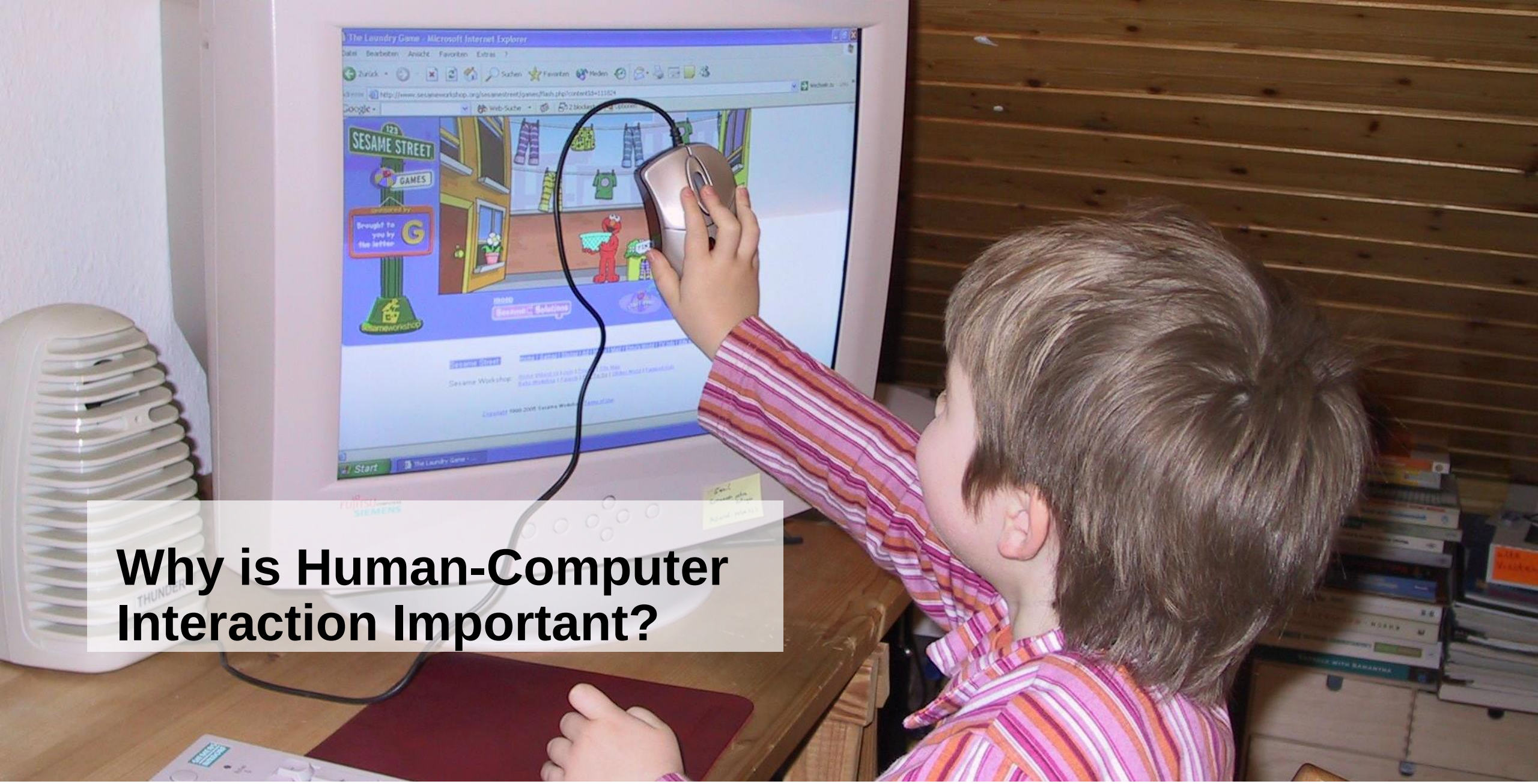


Why is Human-Computer Interaction Important?

Learning Goals

- Understand …
  - how user interfaces impacts our interaction and relationship with (digital) technologies
  - why interaction is relevant from different perspectives (user, companies)
  - why designing interaction is becoming more relevant as technology advances
- Be able to …
  - explain the economic implications of bad usability
  - sketch a user interface and discuss different aspects
  - explain why interaction is a visible innovation

Human-Computer Interaction

How does Human-Computer Interaction impact us?

- **It determines how we use (digital) products.**
- For examples it impacts…
  - what we can do with products and services,
  - how easy or hard it is to work with a software,
  - how quickly you can learn to use a system, or
  - how safe a product is.

- It is central to how we feel and what we experience while interacting with digital technologies.

Let‘s start with a discussion

Pause the video an write 5 points for each question!

- Why is it important that a (digital) product is ease to use?
- .
- .
- .
- .
- .

- What does it mean that a product is usable?
- .
- .
- .
- .
- .

Why is Usability Important?

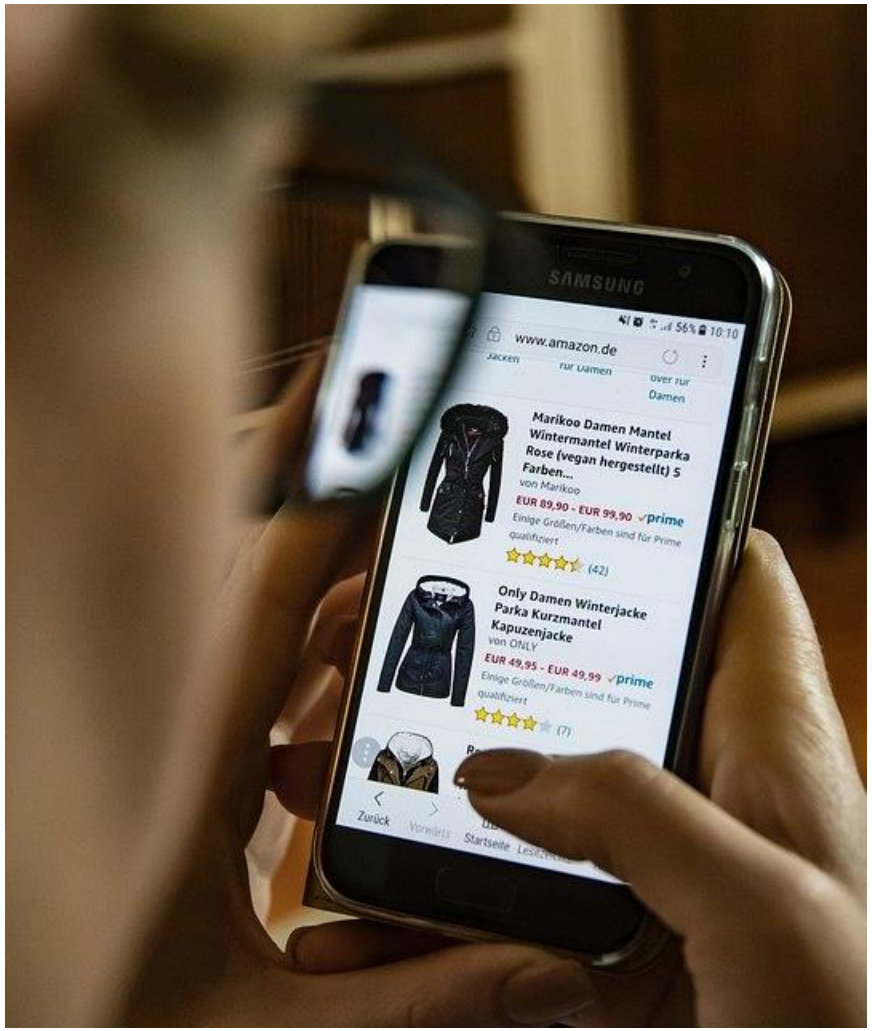
Products that are easy to use a good for business.

- Improving usability can
  - increase productivity of users,
  - reduce costs (support, efficiency),
  - increase sales/revenue (web shop),
  - enhance customer loyalty, or
  - win new customers.
- Case studies that show the benefit of usability
- Usability is often considered as sign of quality
- Usability gives a competitive advantage.

Why Focus on User and Interaction?

How to discriminate your product or service?

- Traditionally product discrimination is by functionality and price
- Why should a customer pick you, if competitors offer very similar functions (e.g. messaging services) at similar prices (e.g. payed by advertising)?
  - Your product is easier to use?
  - You get your tasks done faster?
  - You have more fun doing what you want to do?



Why Focus on User and Interaction?

Trends that make Human-Computer interaction more important

- It becomes harder to discriminate by technology
- Availability of bandwidth, storage and processing
- New input and output technologies
- Computing becomes part of many traditional devices
- Willingness for training or learning applications decreases
- Life-style technologies are more and more digital
- Broad and diverse user groups
- Majority of user are not interested in the technology

- New understanding of computing
  - The old question: What can computers do?
  - The new question: What can humans do with computers?
  - Book by Ben Shneiderman: Leonardo's Laptop

B. Shneiderman. Leonardo's Laptop: Human Needs and the New Computing Technologies. 2002.

Economic dimension of Usability?

Importance in the Context of WWW, Apps and New Media?

- User Interface is often the central discriminating factor
- Often the same product/service is sold at very similar prices
- Competition is very close (just another App, browser tab, …)
- Comparison is easily possible

- Examples: Online-Shop
  - Users who cannot find the product in the shop cannot buy it
  - Users who can fill in the payment form are not going to buy
  - Users who worry if the item fits them are less likely to buy
  - Typically a direct correlation between usability and sales

- “Bad Usability is Like a Leaky Pipe”
  https://90percentofeverything.com/2006/11/13/bad-usability-is-like-a-leaky-pipe/


OX ST.
Christmas is calling
TOPSHOP
50%
TOPSHOP
TOPMAN
ROAD AHEAD CLOSED

Concerns in Human-Computer Interaction

Science, Engineering, and Design Aspects

- The joint performance of tasks by humans and machines
- The structure of communication between humans and machines
- Human capabilities to use machines (including the learnability of interfaces)
- Engineering concerns that arise in designing and building interfaces
- The process of specification, design, and implementation of interfaces
- Design trade-offs
- Algorithms and programming of the user interface itself

Example: Sketch an Interface

How would a user interface that includes both functions look like?
Make sketches for 2 alternative interfaces.

```
String translate(int fromLanguage, int toLanguage, String str)
// translate is a function that takes a word (str)
// the word is from a specific language (fromLanguage) and it
// translates it into a word into another language (toLanguage)
// Example: wordInSpanish = convert(1, 3, "Haus")
// fromLanguage is the language the word is from, toLanguage
// ist die target language (1=German, 2=English, 3=Spanish)

float convert(int fromCurrency, int toCurrency, float amount)
// convert is a function that takes a number (amount) of a specific
// currency (fromCurrency) and it converts it into a number
// (toCurrency) representing the amount in the target currency
// Example: myDollar = convert(6, 7, 19.23)
// fromCurrency ist initlal curreny and toCurrency is the target
// currency (6=Euro, 7=US Dollar, 8=Britisches Pfund)
```

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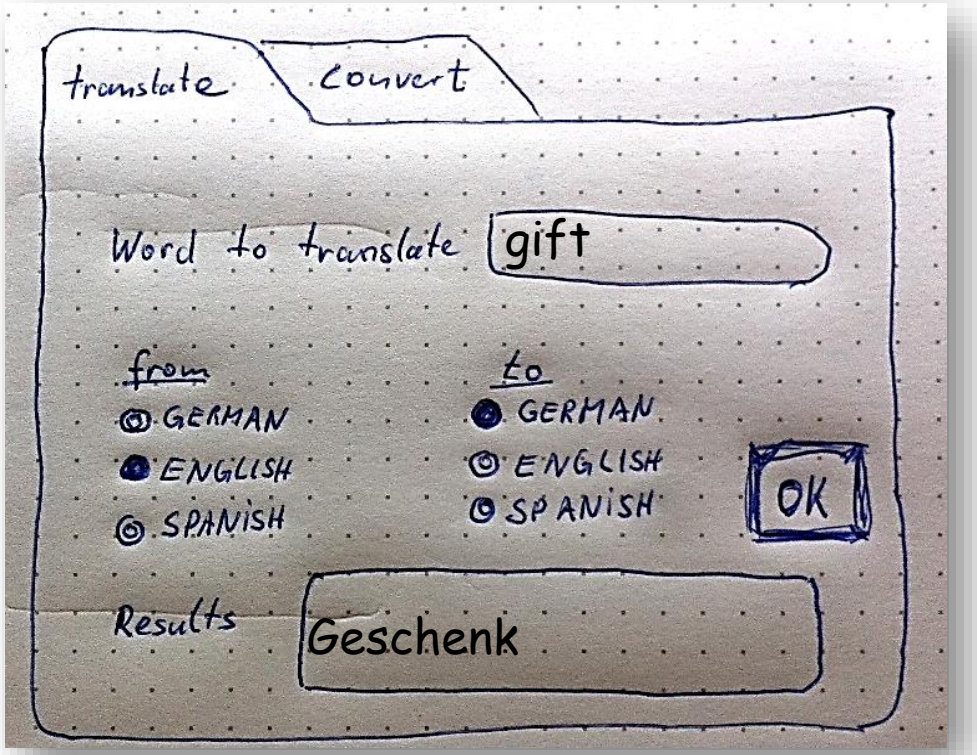

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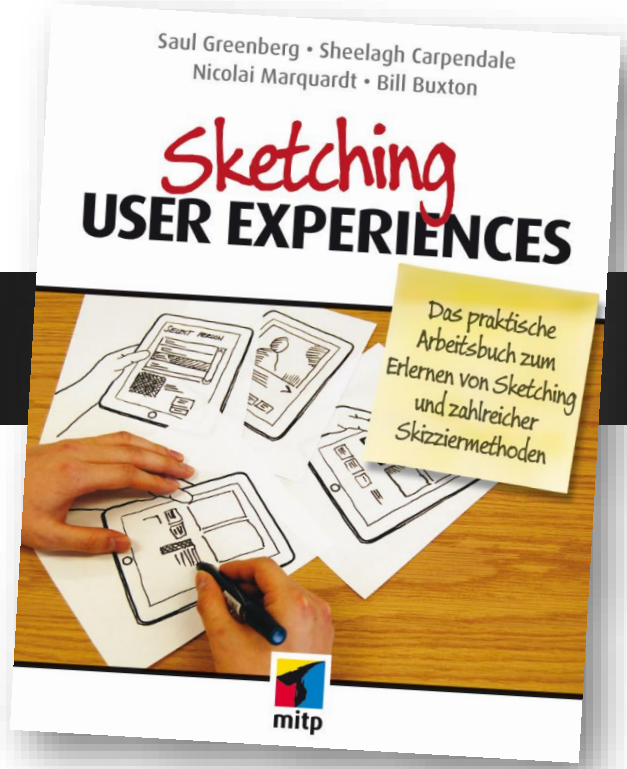

https://www.mitp.de/IT-WEB/Software-Entwicklung/Sketching-User-Experiences.html

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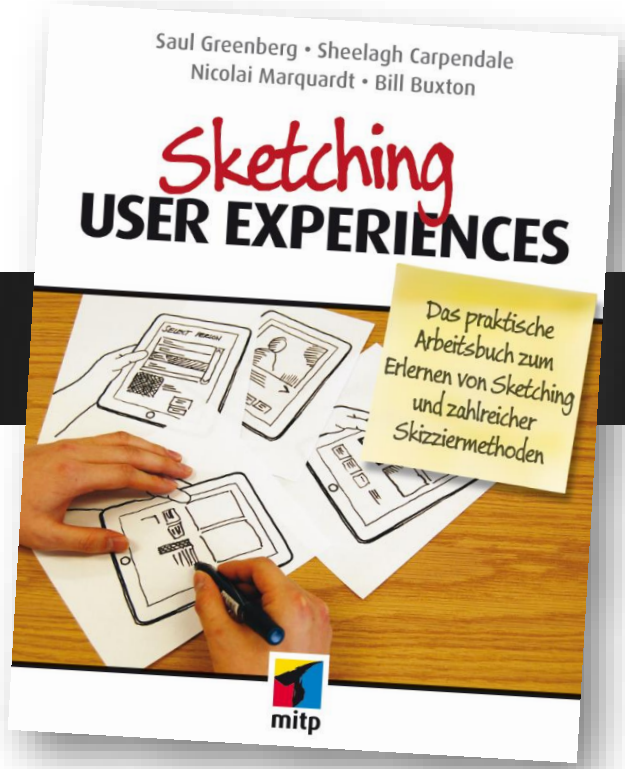


https://www.mitp.de/IT-WEB/Software-Entwicklung/Sketching-User-Experiences.html

It is NOT Only About the User Interface!

Experience includes the overall product and service

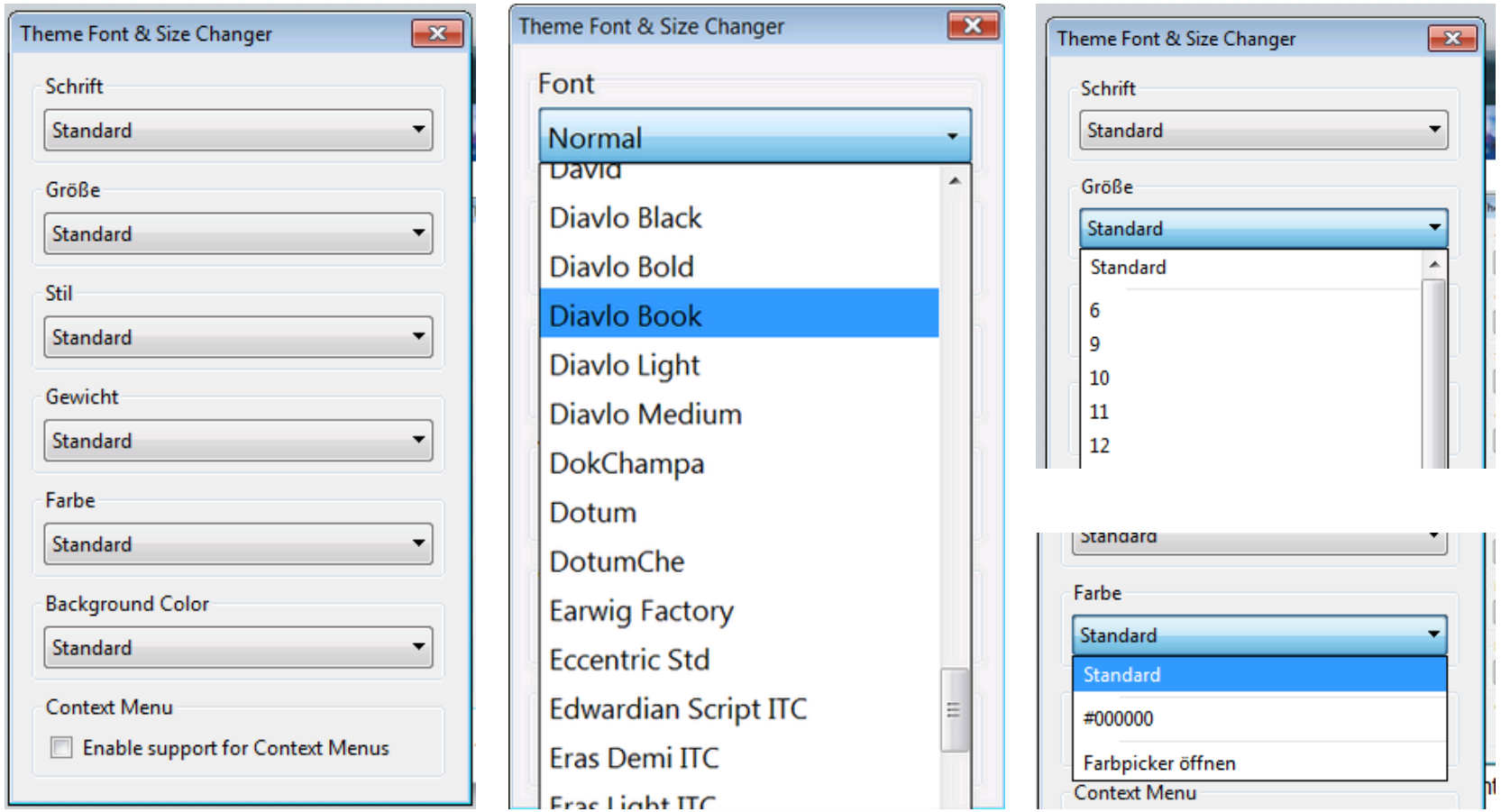
Human-Computer Interaction
…it is about visible innovation

What is your Solution?

- Problems and challenges in Human-Computer Interaction
  - often not seen as problem before there is a solution
  - if problems are identified, they are typically easy to understand by non-experts
- Solutions in Human-Computer Interaction
  - once a solution is there, people will generally not remember that there was a problem
  - good and in particular great solutions (if found) often appear obvious (once they are there)
- The step from problem to solution is however not trivial (but this is often forgotten, once there is a solution)

Example: Selection/Menu for Fonts

Is there a Problem? How to improve it?



https://addons.mozilla.org/en-US/firefox/addon/theme-font-size-changer/

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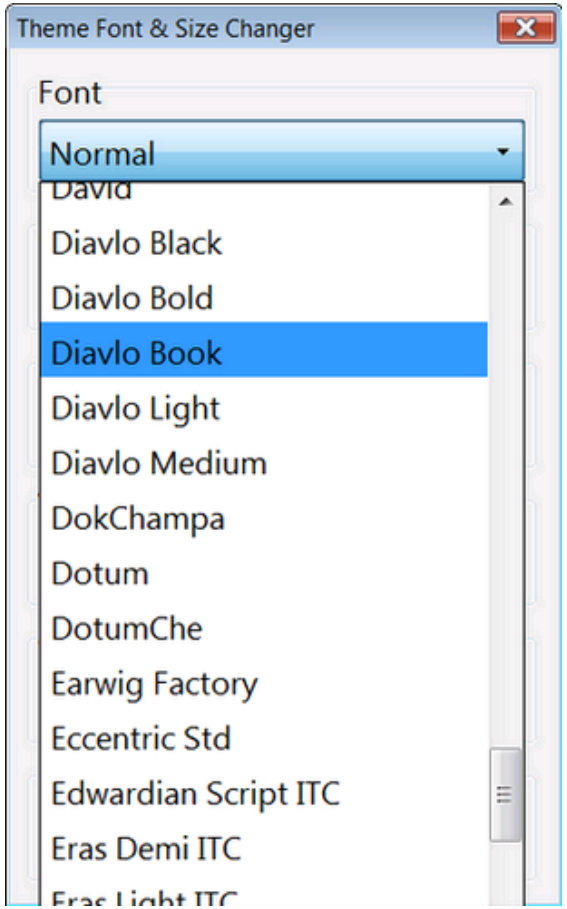

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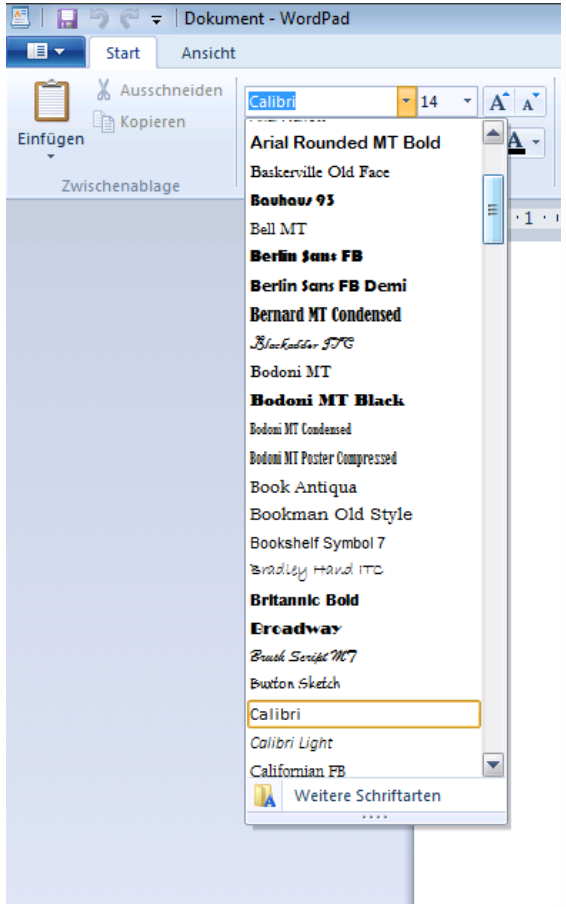
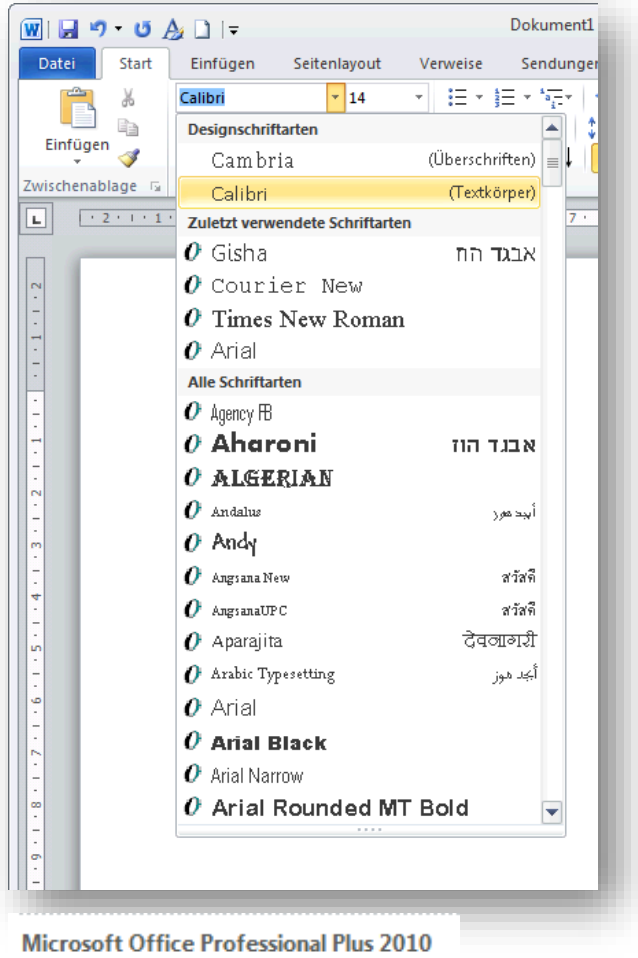


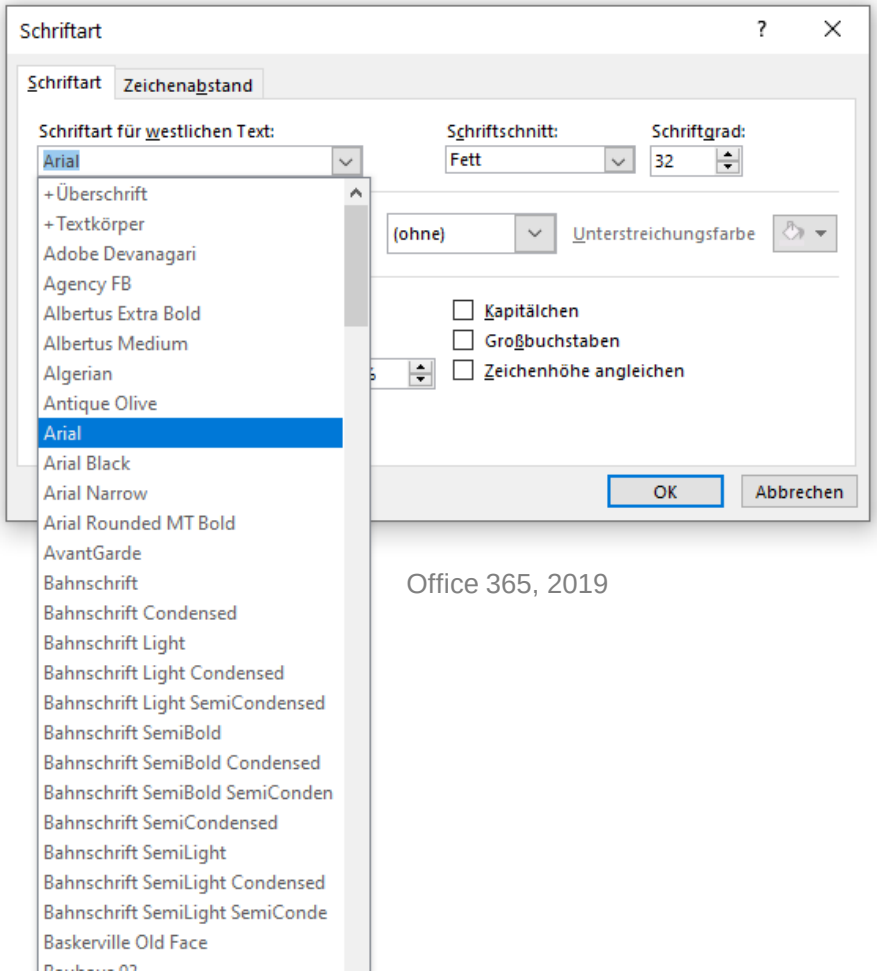
WordPad/Win7



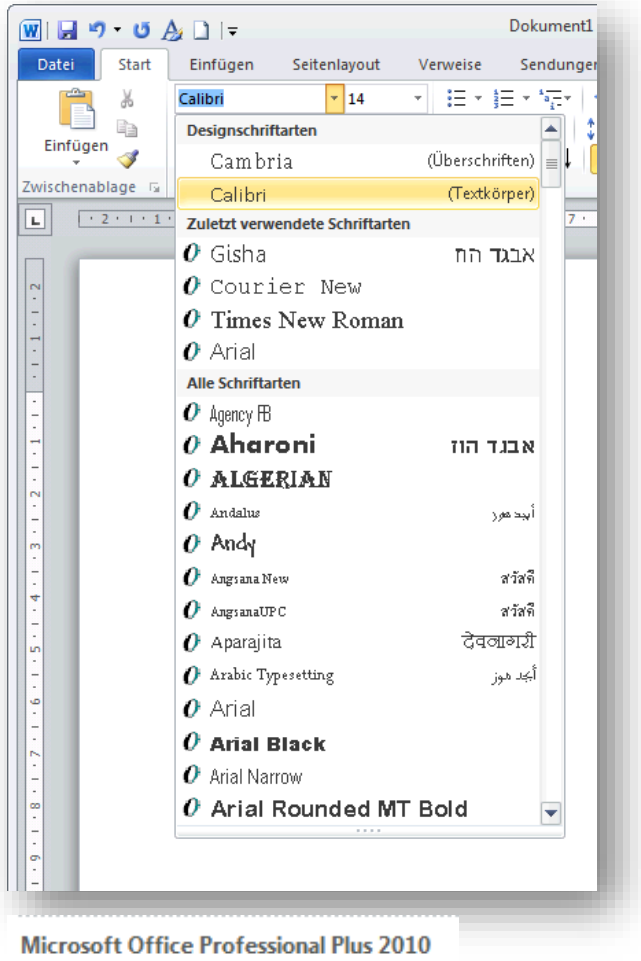
Microsoft Office Professional Plus 2010

Example: Selection/Menu for Fonts

What is the next step for the Office 365 Dialog Box?



Office 365, 2019



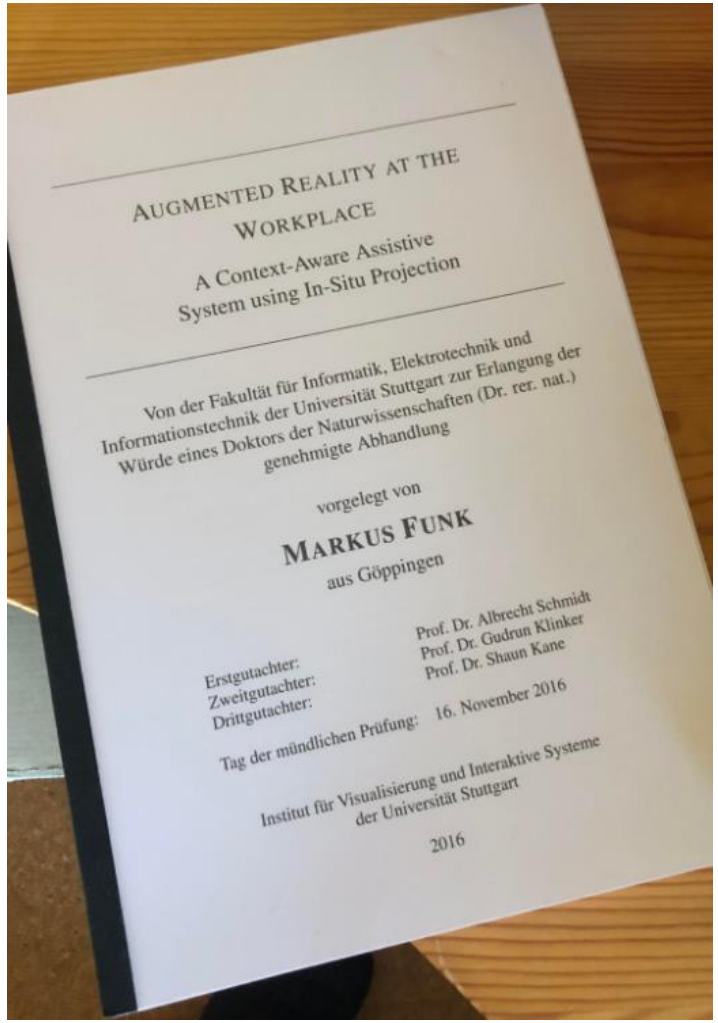
Microsoft Office Professional Plus 2010

Discussion: How long does it take to write a Thesis or a Book?

On a PC vs. on a Phone

- Assume the following
  - the book has 40.000 words
  - typing speed for physical keyboard is 40 words per minute
  - typing speed for phone keyboard is 15 words per minute

- Does this calculation make sense?
- What are we missing here?
- What is different when we write a text message?



Summary

The interface between the user and the information has become most critical for creating effective, efficient and pleasant systems.

- Interface and interaction design defines how we can use devices, services, and applications.
- The interface and interaction design impacts the performance of the user.
- It is important to understand way people use a system as a tool to achieve their goals.
- Human-computer interaction is relevant as it becomes harder to differentiate products based on features.
- Good usability is economically important.
- Sketching user interfaces and discussing design options and trade-offs is important.
- Innovation in Human-Computer interaction is mostly visible.

Did you understand this block?

Can you answer these questions?

- How does the user interface and interaction design impact the user? Give specific examples.
- Explain the economic benefits of a product that is easy to use in the context of a Web based shoe shop.
- What advantages can you expect if you improve the usability of an App or web page?
- Name some trends that make Human-Computer interaction more important.
- Sketch 2 alternative (and different) user interfaces for a world time clock app for a smart watch and discuss the advantages and disadvantages of the designs
- Explain with the example of a font menu the improvement of interactive technologies.
- Give an example that highlights the statement “Problems in HCI are often not seen as problem before there is a solution.”

References

- B. Shneiderman (2002). Leonardo's Laptop: Human Needs and the New Computing Technologies.
  http://mitpress.mit.edu/main/feature/leonardoslaptop/index.html
- B. Buxton (2010). *Sketching user experiences: getting the design right and the right design*. Morgan Kaufmann.
- Harry Brignull (2006). Bad usability is like a leaky pipe.
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