

[Hist] Inventions of HCI (3 Punkte)

Sie haben die folgende Antwort gegeben:

The history of interactive systems is related to a variety of pioneers. For each of the following concepts or inventions, give the name of the corresponding inventor/pioneer.

- MEMEX: 
- SketchPad: 
- Mouse: 

Die bestmögliche Lösung lautet:

- MEMEX:
- SketchPad:
- Mouse:

[Hum] Affordance (1 Punkt)

Sie haben die folgende Antwort gegeben:

Complete the definition of **Affordance** by entering the missing terms at the respective gaps.

- Affordance is the  for action
- Perceived Affordance includes  (Norman)



See slides 3_2020_05_05 Humans_Complete.

Die bestmögliche Lösung lautet:

- Affordance is the for action
- Perceived Affordance includes (Norman)

[Hum] Cocktail party effect (1 Punkt)

Sie haben die folgende Antwort gegeben:

Select the correct statements about the cocktail party effect.

- Also known as intelligent or selective hearing. 
- The human sense of hearing is able to extract sound components from a mixture of interfering sounds. 
- The human sense of hearing overlays sounds of single sources to a mixture of sounds and is not able to distinguish between the single sources. 
- The human sense of hearing is able to extract the sounds of a single source and completely block out the sounds of other sources. 

Die bestmögliche Lösung lautet:

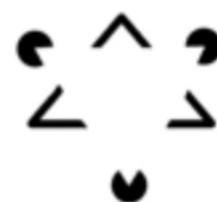
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Die bestmögliche Lösung lautet:

1



4



2



5



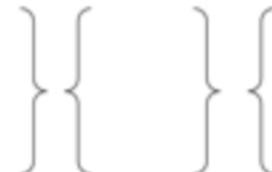
3



6



7



1. Law of Similarity oder Similarity
2. Law of Proximity oder Proximity
3. Law of Continuity oder Continuity
4. Law of Closure oder Closure
5. Law of Pragnanz oder Pragnanz oder Law of Simplicity oder Simplicity oder Law of good shape oder Good shape
6. Law of common fate oder Common fate
7. Law of Symmetry oder Symmetry

[Hum] Gestalt Laws (2) (3 Punkte)

Sie haben die folgende Antwort gegeben:

We as human can easily recognize and decipher the shown captchas (a and b).

Name two Gestalt Laws that help us to decipher these captchas.

Explain each of the named Gestalt Laws in one sentence.



(a)



(b)

Law of Pragnanz / Law of Good Shape: We decode the characters as they are in proper shape and hence they could be recognized.

Law of Symmetry: The characters are symmetrical and follow the same pattern.

Unbegrenzt Zeichen zugelassen, Anzahl der eingegebenen Zeichen: **201**



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[Hum] Recall and Recognition (2 Punkte)

Sie haben die folgende Antwort gegeben:

Define the terms **Recall** and **Recognition** with regards to the Long-term Memory.

Recall: The amount of information that can be retrieved identically without incorporating any thought process, without decay.

Recognition: The identification of an incident based on perception.

Unbegrenzt Zeichen zugelassen, Anzahl der eingegebenen Zeichen: **192**



! RECALL: Information reproduced from memory can be assisted by cues (e.g.: categories, imagery)

RECOGNITION : Information gives knowledge that it has seen before.

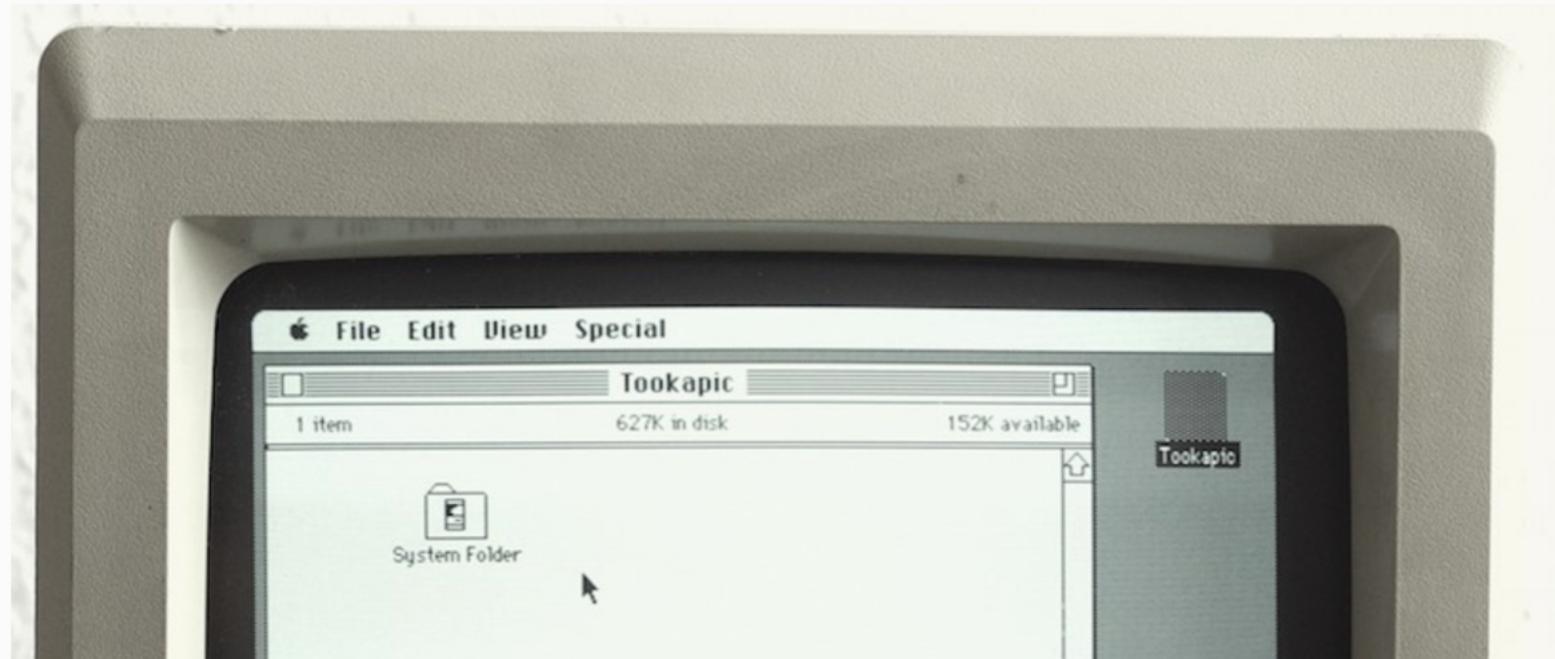
[Princ] Consistency (6 Punkte)

Sie haben die folgende Antwort gegeben:

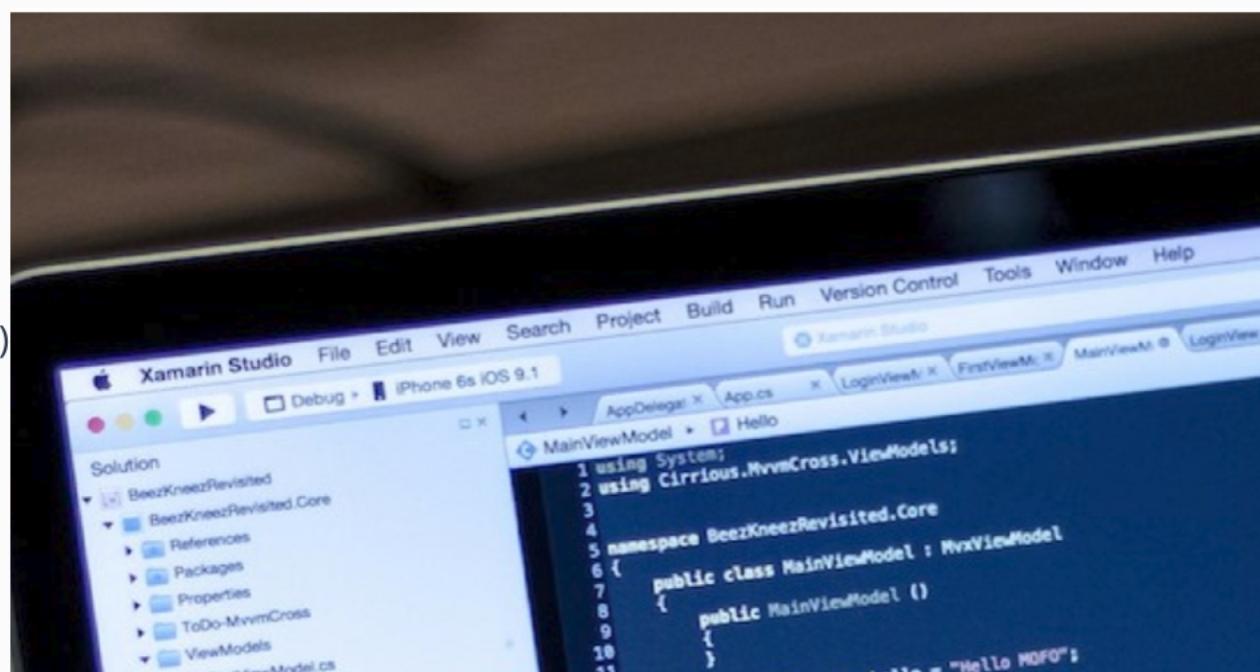
An important rule for design of a User Interface is the strive for consistency. There are three different levels of consistency.

Look at the images below, there you can see two different versions of the Apple operating system from 1980 (a) and 2010 (b).

(a)



(b)



1. Lexical
2. Syntactic
3. Semantic

Please answer the following questions.

1. Name the three different levels of consistency and explain them in one sentence by using an example.
2. Explain how the different levels of consistency were implemented in the different versions of the operating system shown in figure a and b.

[Princ] User errors (1 Punkt)

Sie haben die folgende Antwort gegeben:

Assign the correct descriptions to these two main **types of errors** users can make.

Slips

passt
zu

Right goal but wrong action, result of "automatic" behaviour, appropriate
goal but performance/action is wrong



Mis-
takes

passt
zu

Wrong goal, overgeneralization, wrong conclusions



[Princ] User errors (2) (3 Punkte)

Sie haben die folgende Antwort gegeben:

Assign the correct descriptions to the different **types of slips** users can make.

Capture errors	passt zu	Two actions with common start point, the more familiar one captures the unusual (driving to work on Saturday instead of the supermarket)	<input checked="" type="checkbox"/>
Description errors	passt zu	Performing an action that is close to the action that one wanted to perform (putting the cutlery in the bin instead of the sink)	<input checked="" type="checkbox"/>
Data driven errors	passt zu	Using data that is visible in a particular moment instead of the data that is well-known (calling the room number you see instead of the phone number you know by heart)	<input checked="" type="checkbox"/>
Associate action errors	passt zu	You think of something and that influences your action (e.g. saying come in after picking up the phone)	<input checked="" type="checkbox"/>
Loss-of-Ac-tivation er-ror (forgetting)	passt zu	In a given environment you decided to do something but when leaving then you forgot what you wanted to do. Going back to the start place you remember	<input checked="" type="checkbox"/>
Mode error	passt zu	You forget that you are in a mode that does not allow a certain action or where a action has a different effect	<input checked="" type="checkbox"/>

[ModI] Hick's Law (1.5 Punkte)

Sie haben die folgende Antwort gegeben:

Mark the correct statements and the correct equation about **Hick's Law**.

$T = bH$



$MT = a + b \frac{D}{W}$



The time needed to make a selection is proportional to the log number of alternatives given.



Hick's law applies if it requires linear search.



Hick's law does not apply if it requires linear search.



When the user searches a randomly ordered list of commands in a menu, Hick's law applies.



Die bestmögliche Lösung lautet:

$T = bH$

$MT = a + b \frac{D}{W}$

The time needed to make a selection is proportional to the log number of alternatives given.

Hick's law applies if it requires linear search.

Hick's law does not apply if it requires linear search.

When the user searches a randomly ordered list of commands in a menu, Hick's law applies.

[ModI] KLM (1.75 Punkte)

Sie haben die folgende Antwort gegeben:



Mark the correct statements about **KLM**.

- KLM stands for Keystroke-Level Model. 
- KLM evaluates how good the usability of the interface is. 
- The execution of a task is decomposed into primitive operators: physical motor, mental and system response operator. 
- The KLM is a more complicated version of GOMS. 
- KLM is a very flexible model. 
- There are no multiple goals, no methods and no selection rules. 
- It is only suitable for well defined routine cognitive tasks. 

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[Modl] KLM (2) (5 Punkte)

Sie haben die folgende Antwort gegeben:

Unit Converter Express Version

Length Temperature Area Volume Weight Time

From:

Input: e.g. 19.3

meter
foot
yard
inch
kilometer
mile
centimeter
millimeter
micrometer
nanometer

To:

Output: e.g. 7.3

meter
foot
yard
inch
kilometer
mile
centimeter
millimeter
micrometer
nanometer

K	Keystroke	0.20 sec (average skilled typist)
H	Homing moving hand between mouse and keyboard	0.4 sec
B/BB	Pressing / clicking a mouse button	0.1 sec / 2*0.1 sec
P	Pointing with the mouse to a target	1.1 sec

You are evaluating an application for converting different units (see figure above). As soon as you tap in the left field, the result appears on the right.

Please answer the following question.

1. Explain the KLM Model briefly.
2. Consider the following task: "Convert 30.7 miles into kilometers". The program is already open. Your hand is on the keyboard. The cursor is already in the *From* field. After entering the number in the *From* field and selecting the appropriate units, the result automatically appears in the *To* field.

Estimate the processing time of this task with KLM, explain your approach.

1. Keystroke-Level Model can be applied to determine the processing time of the given User Interface. However, it incorporates three motors to complete the task: Physical, Mental and System Response Motor.

2. First user has to write four (3, 2, ., 7) characters which will take $(4 * 0.2) = 0.8$ sec. Next, he has to transfer hand from Keyboard to Mouse, which will take 0.4 sec. Then, the user has to point to Mile and Kilometers in *From* and *To* field respectively, which will take $(2 * 1.1) = 2.2$ sec. Each has to be selected, which will take $(2 * 0.1) = 0.2$ sec.

Hence total processing time: $0.8 + 0.4 + 2.2 + 0.2 = 3.6$ sec.

Unbegrenzt Zeichen zugelassen, Anzahl der eingegebenen Zeichen: **623**



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[ModI] Wickens Model (4 Punkte)

Sie haben die folgende Antwort gegeben:

The Wickens Model can be used to calculate the interference between two tasks. It consists of four dimensions. Each dimension consists again of the so called "resources".

Name the eight resources that are defined for the Wickens Model.

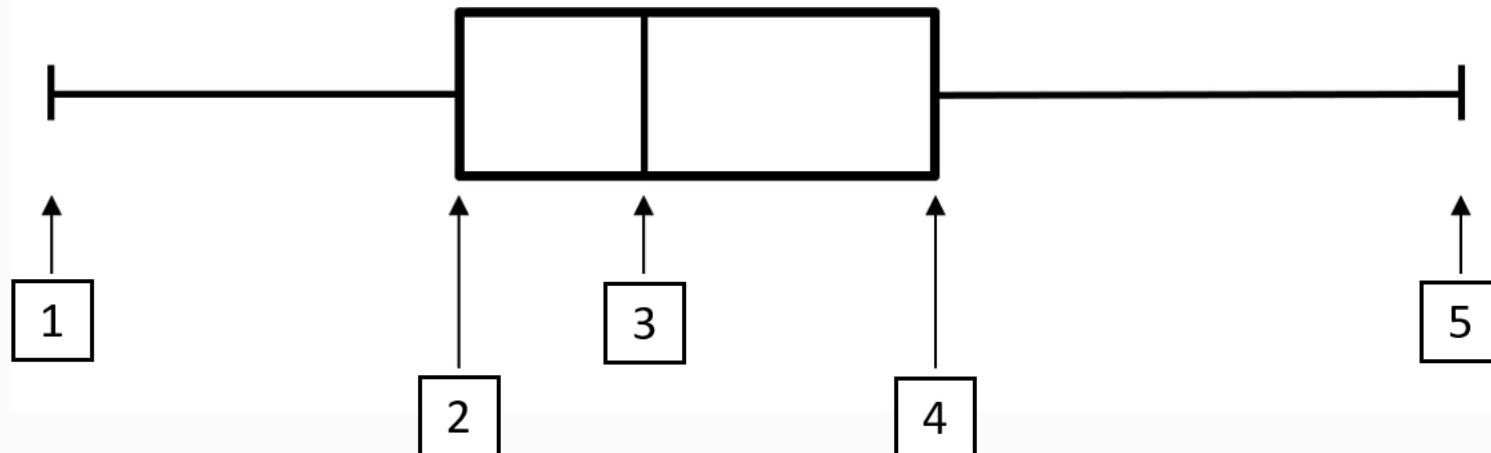
Die bestmögliche Lösung lautet:

1. Visual spatial focal,Visual spatial ambient,Auditory verbal,Auditory spatial,Cognition verbal,Cognition spatial,Responding verbal,Responding spatial

[◀ Zurück zur Übersicht des Durchlaufs](#)

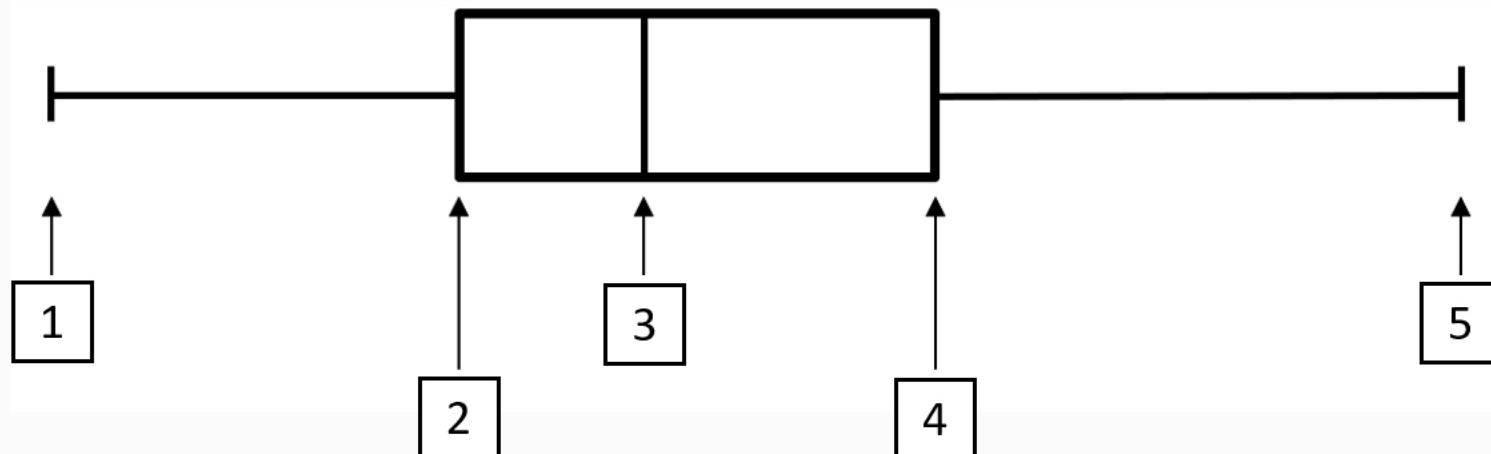
[Eval] Boxplots (4 Punkte)

Sie haben die folgende Antwort gegeben:

Name the components of a **boxplot**.

1. Minimum
2. 1st Quartile
3. Median
4. 3rd Quartile
5. Maximum

Die bestmögliche Lösung lautet:



1. Minimum oder Min oder minimum oder min
2. First quartile oder 1st quartile oder first quartile
3. Median oder median
4. Third quartile oder 3rd quartile oder third quartile
5. Maximum oder Max oder maximum oder max

Die bestmögliche Lösung lautet:

Between-group design	passt zu	Also called independent-measures design; Participants are assigned to one condition only
Between-group design	passt zu	Less chance of practice or fatigue effects; Useful when it is impossible for an individual to participate in all conditions
Between-group design	passt zu	Expense (time, effort, and number of participants); Insensitivity to experimental manipulations
Within-subject design	passt zu	Also called repeated-measures design; Participants are assigned to all conditions; Order must be counter-balanced or randomized
Within-subject design	passt zu	Sensitivity; Cancelling out individual differences
Within-subject design	passt zu	Carry-over effects from previous conditions; Conditions need to be reversible
Hybrid designs	passt zu	Combines aspects of between-group design and within-subject design

[Eval] Median (3.5 Punkte)

Sie haben die folgende Antwort gegeben:

A study shows an experiment in which the reaction time of goalkeepers is measured. They should press a button as soon as a symbol appears on a white screen. The data, except for a few outliers, are all within a range of 400 - 600 milliseconds. In the study, the median was calculated to evaluate the reaction time.

Why was the median chosen in the study? What disadvantages could the median have?

Choose the correct explanations.

- Relatively unaffected by outliers ✓
- Not very stable ✓
- Resistant to sampling variation ✗
- Consideres every score, therefore most accurate summary of the data ✓
- Affected by outliers ✓
- Can also be used with nominal data ✗
- Describes how most people behave ✓

Die bestmögliche Lösung lautet:

- Relatively unaffected by outliers
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- Can also be used with nominal data
- Describes how most people behave

[Eval] Study scenarios (4 Punkte)

Sie haben die folgende Antwort gegeben:

Imagine you have developed two different virtual handball scenarios and are testing them on 100 handball players. Both scenarios show a move that is about reacting as fast as possible to the environment. You want to test which of the two scenarios is better suited for a performance analysis of handball players. You test all 100 handball players in both scenarios and investigate both objective and subjective measures. For the objective measure you measure the reaction time during the move and for the subjective measure, the user experience with a questionnaire after the move. This gives you the reaction time and the user experience for each scenario as the basis for comparing the two scenarios.

Please answer the following questions.

What is/are the independent variable(s)?

The reaction time

What is/are the dependent variable(s)?

The results of the UX questionnaire

Which experimental design was used?

Mixed design

What was the null hypothesis?

There is no significant difference between the results of the UX questionnaire for the two scenarios

Die bestmögliche Lösung lautet:

What is/are the independent variable(s)?

The two different handball scenarios

What is/are the dependent variable(s)?

The reaction time and the results of the UX questionnaire

Which experimental design was used?

Within-subject design

What was the null hypothesis?

There is no significant difference between the two scenarios

[Eval] SUS (1.25 Punkte)

Sie haben die folgende Antwort gegeben:

Find the correct statements about the **SUS**.

- SUS stands for System Utility Scale X
- The SUS is a 15 item questionnaire with 5 response options ✓
- SUS yields a single number representing a composite measure of the overall usability of the system being studied. X
- SUS scores have a range of 0 to 100 ✓
- Average is reported at SUS score 68 ✓

Die bestmögliche Lösung lautet:

- SUS stands for System Utility Scale
- The SUS is a 15 item questionnaire with 5 response options
- SUS yields a single number representing a composite measure of the overall usability of the system being studied.
- SUS scores have a range of 0 to 100
- Average is reported at SUS score 68

[Anyl] Data collection techniques (2 Punkte)

Sie haben die folgende Antwort gegeben:

Name the **data collection techniques** fitting the given descriptions.

- Pencil and Paper 
(cheap and easy but unreliable)
- Audio and Video Recordings 
(cheap and easy, but creates lots of data and may be expensive
to analyze)
- Photos
- Computer Logging 
(reliable and accurate, but actions may be limited)
- User Notebook 
(user keeps diary style protocol, but may be very tedious)

Sie haben die folgende Antwort gegeben:

Select the correct statements about **diary studies**.

- Users are asked to keep a diary of their interactions with a computer system X
- Users are typically asked to record the date and time of an event, where they are, information about the event of significance, and ratings about how they feel, etc. ✓
- Users are asked to document significant events or problems for example during the use of the system ✓
- Users are asked to document the interactions with cameras X
- Diary studies can be used for tasks that are done very quickly or hard to observe X
- Diary studies can be used when only a selective date is required ✓
- The user can also get a tape recorder and a list of questions to avoid handwritten notes X

Die bestmögliche Lösung lautet:

- Users are asked to keep a diary of their interactions with a computer system
- Users are typically asked to record the date and time of an event, where they are, information about the event of significance, and ratings about how they feel, etc.
- Users are asked to document significant events or problems for example during the use of the system
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- Diary studies can be used for tasks that are done very quickly or hard to observe
- Diary studies can be used when only a selective date is required
- The user can also get a tape recorder and a list of questions to avoid handwritten notes

[Anyl] Task analysis (1.75 Punkte)

Sie haben die folgende Antwort gegeben:

Find the correct statements about **task analysis**.

- Used to analyze work processes and interactions 
- Used to analyze typical users 
- Analysis of all actions performed by the user to accomplish a task 
- Analysis of the mental processes of the user while performing a task 
- Tasks are split into smaller sub-tasks 
- The granularity and level of detail should be suitable for the analyzed task 
- The more granularity and level of detail can be achieved, the better 

Die bestmögliche Lösung lautet:

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- The more granularity and level of detail can be achieved, the better

[Proto] Prototype design (4 Punkte)

Sie haben die folgende Antwort gegeben:

Suppose you need to develop a supporting device that helps elderly people monitor and manage their health and daily tasks. Think of an interaction concept and a terminal that are both suitable for this target group, taking into account the specific needs of people who are not used to using mobile terminals and computer systems.

Please answer the following questions below.

1. Name four potential Stakeholders for your product.
2. What type of prototype would you deploy for a first evaluation of your product?
Explain why you decided to use this kind of prototype.
3. Name another type of prototype that falls into the taxonomy of your chosen prototype.

1. Elderly people, User Interface Designer, User Experience Developers, Investors and Manufacturer of the Product.
2. High-Fidelity Taxonomy has to be deployed for a first evaluation of the product. Because the entire system has to be designed with all the functionalities. As this product will suffice the purpose of elderly people who are not used to use digital devices, the proper Interface has to be there.
3. Another Prototype could be Low-Fidelity Taxonomy.

Unbegrenzt Zeichen zugelassen, Anzahl der eingegebenen Zeichen: **462**

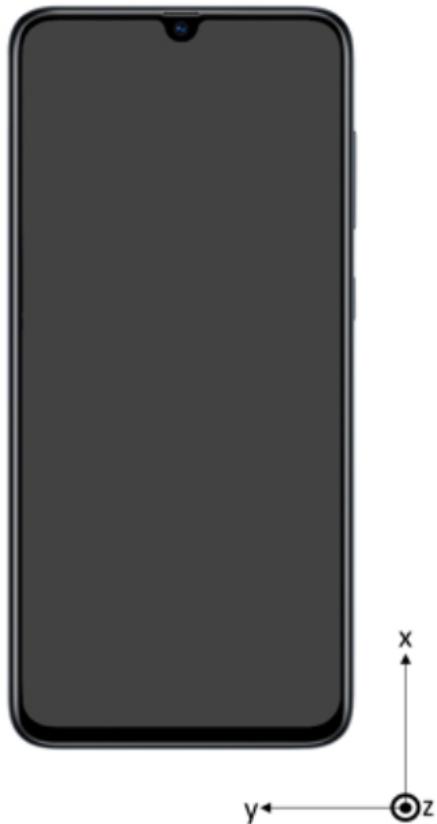


1. **Horizontal oder Horizontal prototype oder Horizontal prototyping** : Displays “breadth” of functionality, no back end” support, e.g. database link
2. **Vertical oder Vertical prototype oder Vertical prototyping** : Full functionality and performance of a “slice” or small part of the system
3. **Low-fidelity prototyping oder Low-Fidelity prototyping oder Low-fidelity oder Low-Fidelity oder Low-Fidelity prototype oder Low-fidelity prototype** : Paper and post-it prototypes, Wizard of Oz
4. **High-fidelity prototyping oder High-Fidelity prototyping oder High-Fidelity oder High-fidelity oder High-Fidelity prototype oder High-fidelity prototype** : Interface builder tools
5. **Throw-away prototype oder Throw-away oder Throw away oder Throw away prototype oder Rapid prototyping** : Requirements gathering, testing specific aspects
6. **Evolutionary prototyping oder Evolutionary prototype oder Evolutionary** : Delivery of prioritized functions incrementally, with an evolving design
7. **Functional prototype oder Functional prototypes oder Functional** : Use real (or at least realistic) data
8. **Non-functional prototype oder Non-functional prototypes oder Non-functional** : Functionality is not implemented

[Tech] Input device taxonomy by Card (4 Punkte)

Sie haben die folgende Antwort gegeben:

Use the input device taxonomy defined by Card to classify the depicted smartphone (2 keys on the right side, touch surface).



Choose the correct one of the given options and give an explanation for your choice.

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[Wear] Resistive sensing (1.5 Punkte)

Sie haben die folgende Antwort gegeben:

Mark the correct statements about **resistive sensing**.

- Resistive sensing measures force intensity on the metall surface. 
- The physics principle is based on a rigid carbon polymer. 
- The resistive sensing works inductively and is force sensitive. 
- The resistive sensing works conductively and is force sensitive. 
- The physics principle is based on a flexible carbon polymer. 
- Resistive sensing measures force intensity on the fabric surface. 

Die bestmögliche Lösung lautet:

- Resistive sensing measures force intensity on the metall surface.
- The physics principle is based on a rigid carbon polymer.
- The resistive sensing works inductively and is force sensitive.
- The resistive sensing works conductively and is force sensitive.
- The physics principle is based on a flexible carbon polymer.
- Resistive sensing measures force intensity on the fabric surface.

[Wear] Wearable technology (2 Punkte)

Sie haben die folgende Antwort gegeben:

Fill the gaps to complete the definition of Wearable Computing (Steve Mann).

Wearable Computing:

A computer on the body  that is

- Always on 
- Always connected 
- Always accessible 

Die bestmögliche Lösung lautet:

Wearable Computing:

A computer on the body that is

- Always on oder accessible oder connected
- Always accessible oder on oder connected
- Always connected oder accessible oder on