

# Handbook for the modular extension of the User Experience Questionnaire

All you need to know to apply the UEQ+ to create your own UX questionnaire

Authors: Martin Schrepp, Jörg Thomaschewski Version 6 (03.12.2023)

# What is the UEQ+

The UEQ+ is a modular extension of the user experience questionnaire (UEQ, see Laugwitz, Schrepp & Held, 2008). The UEQ is widely used questionnaire that measures user experience with 6 scales (*Attractiveness*, *Efficiency*, *Perspicuity*, *Dependability*, *Stimulation* and *Novelty*). All information concerning the UEQ can be found on <a href="https://www.ueq-online.org">www.ueq-online.org</a>.

However, in several scenarios, other UX relevant factors, not contained in the original UEQ, are of high relevance. On the other hand, a single UX questionnaire cannot solve this issue since we cannot simply add more and more scales. First, this would increase the effort to fill the questionnaire. Second, some UX aspects are only relevant for special product categories, and it would sound strange to include them in a general questionnaire. For example, haptics (how does it feel when you touch the product) is relevant for certain types of household appliances, but surely not for a social network or a business application.

The UEQ+ tries to solve this problem with a modular approach. It contains a larger list of UX scales. The researcher can pick from that list those scales that are most relevant for the product he or she wants to investigate. In this sense the UEQ+ is not a UX questionnaire, it is a tool to build concrete questionnaires that are adapted to special evaluation scenarios.

# What is the difference between UEQ and UEQ+?

The UEQ is a UX questionnaire with a fixed number of six scales intended to measure a broad range of UX aspects. The UEQ+ is a collection of scales to build a concrete UX questionnaire dependent on the needs of the evaluation. The UEQ+ can be used to build UX questionnaires that are adapted to the concrete needs of a specific product, i.e. that measure exactly the UX aspects that seems to be most relevant for this special product.

# Advantages and disadvantages of UEQ+

As we already mentioned above, one of the big advantages of the UEQ+ is that you can optimize your UX questionnaire for your research question. You can build a questionnaire that contains just those UX aspects as scales that are of highest relevance for the product that should be evaluated.

But this does not come for free. Such an approach has also some drawbacks. It requires some additional effort before you can start your evaluation. In addition, data analysis is more difficult, and the interpretation of the results is harder. Let's look at these disadvantages in more detail:

- Effort to set up the questionnaire: Obviously, any application of the UEQ+ requires that the researchers identify the scales they want to use for the questionnaire. Some suggestions concerning suitable processes to do this are described at a later point in this handbook.
- Data analysis: For the UEQ it is sufficient to paste the data in the data analysis sheet (available for download under <a href="www.ueq-online.org">www.ueq-online.org</a>). A lot of relevant analyses are already implemented in this sheet, so most questions can be answered with almost no effort. Since the scales of the UEQ+ can vary between different studies, the effort for a data analysis is obviously higher. But to make it at least as easy as possible, there is also a data analysis sheet for the UEQ+ offered.
- Interpretation of the results: Scale values, i.e. the pure numbers, do not tell much. What does a scale value of 1.3 on a scale from -3 to +3 really mean? Is this good, bad or somewhere in-between? Established questionnaires, like the UEQ, offer a benchmark that helps to interpret the results (the UEQ benchmark is part of the UEQ data analysis sheet). The UEQ benchmark relies on a really huge number of studies concerning different products. Thus, a simple comparison of the results obtained for an evaluated product with the benchmark offers some insights how good or bad the impression of the product is compared to typical products in the market. This helps a lot to interpret the results. For the newly added scales obviously such a detailed benchmark is not available in the moment. In addition, some of the scales apply to quite specialized types of products, thus it may take a long time until enough data are available to build a classical benchmark.

## When should I use the UEQ and when should I use the UEQ+?

Given the remarks concerning the advantages and disadvantages of a modular questionnaire it is possible to give some recommendations:

If you evaluate a single product and your main research question is to get an
idea about the UX quality of this product, you should use the UEQ. Even if
some of the scales do not perfectly match your product or if some scales that
you think are important are missing, the availability of the UEQ benchmark
and the ease of use of the available material, like the data analysis tool, would
clearly speak for using the UEQ.

- If you plan to evaluate the same product multiple times, for example to get an insight if the product improves over time, and if the UEQ scales do not capture most of the UX aspects you consider as relevant, then you should go for your own special questionnaire built with the UEQ+. In this scenario the missing benchmark is not a big issue, since you are mainly interested in comparing multiple measurements of the same product over time. Thus, capturing the UX quality in an optimized form is more important here.
- If you want to set up an UX measurement as part of your quality process for a larger suite of similar products (in the sense that the same UX aspects apply to all of them) and if the scales of the original UEQ do not fit well to your needs, then it is also recommended to set up your own questionnaire using the UEQ+ In this case the additional effort required is neglectable, since you do this only once and reuse it in a high number of concrete evaluations. In addition, the missing benchmark is not so important, since you will generate over time an own data set of evaluations that help to interpret then the results obtained for a single product, i.e. in such a scenario you will quickly generate enough data yourself.

## Classification of the scales in the UEQ+

The UEQ+ contains already a high number of scales and this number will most likely grow in the future. The scales measure the subjective impression of users towards dedicated aspects of user experience. To make it easier for UX researchers to pick the best scales for their projects we suggest in the following a grouping of the available scales. A detailed description of all scales is provided in the next section.

	Scales not restricted to a special product type or scenario						
Efficiency	Impression that tasks can be finished without unnecessary effort.	These scales are not restricted to a certain type of products or					
Usefullness	Impression that using the product is beneficial.	special usage scenarios. But of course, that does not mean that					
Perspicuity	Impression that it is easy to learn how to use the product.	they are equally important for all types of products. For example,					
Adaptability	Impression that the product can be easily adapted to personal preferences or working styles.	Trust is especially important for products that handle sensitive data, e.g. banking apps, eCommerce or Social Networks.					
Dependability	Impression to be in control of the interaction with the product.	Adaptability is typically only of interest for products that are					
Intuitive Use	Impression that the product can be used immediately without any training or help.	heavily used in a professional environment. Please think					
Stimulation	Impression that it is interesting and fun to use the product.	carefully what are the most important UX aspects for your products and restrict your survey					
Novelty	Impression that the product design or product idea is creative and original.	to these scales.					
Trust	Impression that sensitive data are in safe hands and are not misused.						
Attractiveness	Overall impression concerning the product. Do users like or dislike it?						

	Products with a graphical user in	terface			
	Perception that the graphical user	Products that can be operated			
Visual	interface of the product looks beautiful	over a graphical user interface or			
Aesthetics	and appealing?	some physical control elements. Also applicable for mobile devices to measure the impression on the design of the device.			
	Perception that the user interface is well-				
Clarity	structured and of low visual complexity.				
	· ,				
Value	Impression that the product design looks	design of the device.			
	professional and valuable.				
	Products that transport content or I	knowledge			
Trustworthiness	Impression that the information provided	Websites that provide information			
of Content	by the product of good quality and	about organizations or certain			
or content	reliable.	topics, News Portals, Online			
	Impression that the information provided	Journals, Learning Software.			
Quality of	by the product is actual and well-				
Content	prepared.				
	Voice assistants				
Response	Impression that the voice assistant	Voice assistants like Alexa, Google			
Behavior	behaves respectful and trustworthy.	Assistant or Siri. Products that			
	Impression that the responses of a voice	interact with the user over voice.			
Response	assistant cover the user's information				
Quality	needs.				
Comprehens-	Impression that the assistant correctly				
	understands the users' instructions and				
ibility					
1	i questions using natural language.				
	questions using natural language.  Household appliances				
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# Detailed description of the available scales in the UEQ+

In the following we list the currently available scales of the UEQ+. This list will most likely grow in the future to include even more UX relevant quality characteristics of products.

For each scale we describe the semantic interpretation of the scale, the source of the scale (i.e. the paper in which the construction of the items was described first), the German (original language) and English items, and hints concerning the product categories for which this scale is most relevant. Sometimes a scale with a similar semantic interpretation does exist in other questionnaires or in publications concerning UX under a different name. In this case we list these alternative names to clarify the connection.

## Attractiveness (Attraktivität)

Semantic Interpretation: Overall impression of the product. Do users like or dislike it?

Alternative names: Valence, Overall Impression

Source: Attractiveness is one of the 6 original UEQ Scales. The scale consists initially of 6 items. Two items were removed to reduce it to the standard length of 4 items in the UEQ+. The scale development is described in the original publication of the UEQ (Laugwitz, Schrepp & Held, 2008).

Items (German – Original Version):

Insgesamt empfinde ich das Produkt als:

- unerfreulich / erfreulich
- schlecht / gut
- unangenehm / angenehm
- unsympathisch / sympathisch

*Items (English Translation):* 

In my opinion, the product is generally:

- annoying / enjoyable
- bad / good
- unpleasant / pleasant
- unfriendly / friendly

*Product Categories:* This scale can be applied for all product categories.

## Efficiency (Effizienz)

Semantic Interpretation: The user has the subjective impression that he or she can achieve the goals related to the usage of the product with minimal effort. The product responds quickly to user actions. The user has the impression that he or she is not forced to enter unnecessary information or to do unnecessary clicks to perform typical tasks.

*Source:* This is one of the 6 original UEQ scales (Laugwitz, Schrepp & Held, 2008). Items of both scales are identical.

Für das Erreichen meiner Ziele empfinde ich das Produkt als:

- langsam / schnell
- ineffizient / effizient
- unpragmatisch / pragmatisch
- überladen / aufgeräumt

Items (English Translation):

To achieve my goals, I consider the product as:

- slow / fast
- inefficient / efficient
- impractical / practical
- cluttered / organized

*Product Categories:* Especially relevant for products that are used to achieve certain work-related goals. For example, business software, word processing, spreadsheet, programming tools, etc.

# Perspicuity (Durchschaubarkeit)

Semantic Interpretation: The user has the subjective impression that it is easy to understand and learn how to use the product.

Alternative names: Learnability

Source: This is one of the 6 original UEQ scales (Laugwitz, Schrepp & Held, 2008). Items of both scales are identical.

*Items (German – Original Version):* 

Die Bedienung des Produkts empfinde ich als:

- unverständlich / verständlich
- schwer zu lernen / leicht zu lernen
- kompliziert / einfach
- verwirrend / übersichtlich

Items (English Translation):

In my opinion, handling and using the product are:

- not understandable / understandable
- difficult to learn / easy to learn
- complicated / easy
- clear / confusing

Product Categories: Applies to all products that have a certain level of complexity and that are used to reach certain goals, for example business software, word processing,

spreadsheet, programming tools, social networks, etc. For products that are quite simple or that are used only once or where there is a long time-interval between two usages, it is better to evaluate the UX aspect *Intuitive Use* instead. We suggest measuring either *Perspicuity* or *Intuitive Use*, since these UX aspects show a certain similarity.

## Dependability (Steuerbarkeit)

Semantic Interpretation: The user has the subjective impression that the product responds predictably and consistently to inputs and commands. The user feels that he or she completely controls the interaction with the product.

Alternative names: Controllability

Source: This is one of the 6 original UEQ scales (Laugwitz, Schrepp & Held, 2008). Items of both scales are identical.

Items (German – Original Version):

Die Reaktionen des Produkts auf meine Eingaben und Befehle empfinde ich als:

- unberechenbar / vorhersagbar
- behindernd / unterstützend
- nicht erwartungskonform / erwartungskonform
- unsicher / sicher

Items (English Translation):

In my opinion, the reactions of the product to my input and command are:

- unpredictable / predictable
- obstructive / supportive
- not secure / secure
- does not meet expectations / meets expectations

*Product Categories:* Especially relevant for products that are used frequently to achieve certain work-related goals. For example, business software, word processing, spreadsheet, programming tools, etc.

## Stimulation (Stimulation)

Semantic Interpretation: The user has the impression that using the product is stimulating and exciting. It's fun to deal with and work with it.

Alternative names: Fun-of-use

Source: This is one of the 6 original UEQ scales (Laugwitz, Schrepp & Held, 2008). Items of both scales are identical.

Die Beschäftigung mit dem Produkt empfinde ich als:

- langweilig / spannend
- uninteressant / interessant
- einschläfernd / aktivierend
- minderwertig / wertvoll

*Items (English Translation):* 

In my opinion, handling and working with the product are:

- inferior / valuable
- boring / exciting
- not interesting / interesting
- demotivating / motivating

*Product Categories:* Applies to a wide range of products. Especially important for products used for leisure and fun, but also of interest for business applications or other tools.

# Novelty (Originalität)

Semantic Interpretation: The user has the impression that the design of the product looks new, fresh and original and catches therefore his or her attention.

Alternative names: Originality

*Source:* This is one of the 6 original UEQ scales (Laugwitz, Schrepp & Held, 2008). Items of both scales are identical.

*Items (German – Original Version):* 

Die Produktidee bzw. die Gestaltung des Produkts finde ich:

- phantasielos / kreativ
- konventionell / originell
- herkömmlich / neuartig
- konservativ / innovativ

*Items (English Translation):* 

In my opinion, the idea behind the product and its design are:

- dull / creative
- conventional / inventive
- usual / leading edge
- conservative / innovative

*Product Categories:* Applies to a wide range of products, especially to those products directly purchased or selected by the user. In this case it is important to catch the user's attention to

be successful. Can also be of interest for marketing purposes to judge if a new product will catch attention in product demos or marketing videos.

# Aesthetics (visuelle Ästhetik)

Semantic Interpretation: The user has the impression that the product looks beautiful and appealing.

Alternative names: Beauty

Source: Scale development is described in Schrepp & Thomaschewski (2019).

*Items (German – Original Version):* 

Die visuelle Gestaltung des Produkts empfinde ich als:

- hässlich / schön
- stillos / stilvoll
- nicht ansprechend / ansprechend
- unästhetisch / ästhetisch

Items (English Translation):

In my opinion, the visual design of the product is:

- ugly / beautiful
- lacking style / stylish
- unappealing / appealing
- unpleasant / pleasant

*Product Categories:* Applies to all product categories that have a graphical user interface or can be operated over some physical control elements (for example household appliances).

#### Adaptability (Anpassbarkeit)

Semantic Interpretation: The user has the impression that he or she can easily adapt the product to personal preferences or personal working styles.

Alternative names: Suitability for Individualization, Personalization

Source: Scale development is described in Schrepp & Thomaschewski (2019).

*Items (German – Original Version):* 

In Bezug auf meine persönlichen Anforderungen und Vorlieben ist das Produkt:

- nicht anpassbar / anpassbar
- nicht veränderbar / veränderbar
- starr / flexibel
- nicht erweiterbar / erweiterbar

Items (English Translation):

Regarding my personal requirements and preferences, the product is:

- not adjustable / adjustable
- not changeable / changeable
- inflexible / flexible
- not extendable / extendable

*Product Categories:* Relevant for interactive products that are used frequently in a working context to reach certain goals. Can also be of relevance for products where the user needs the possibility to filter out irrelevant information or needs to protect his or her privacy by controlling access to information (e.g., in social networks or messengers).

# Usefulness (Nützlichkeit)

Semantic Interpretation: The user has the impression that using the product brings him or her advantages. It makes it easier to reach his or her goals, saves time and improves the personal productivity.

Source: Scale development is described in Schrepp & Thomaschewski (2019).

*Items (German – Original Version):* 

Die Möglichkeit das Produkt zu nutzen empfinde ich als:

- nutzlos / nützlich
- nicht hilfreich / hilfreich
- nicht vorteilhaft / vorteilhaft
- nicht lohnend / lohnend

*Items (English Translation):* 

I consider the possibility of using the product as:

- useless / useful
- not helpful / helpful
- not beneficial / beneficial
- not rewarding / rewarding

*Product Categories:* Applies to all products which are used to reach certain goals, for example business software, spreadsheets, word processing, programming environments, communication tools, etc.

## Intuitive Use (Intuitive Bedienung)

Semantic Interpretation: The user has the impression that he or she can use the product immediately without any training, instructions or help from others.

Source: Scale development is described in Schrepp & Thomaschewski (2019).

Die Bedienung des Produkts wirkt auf mich:

- mühevoll / mühelos
- unlogisch / logisch
- nicht einleuchtend / einleuchtend
- nicht schlüssig / schlüssig

*Items (English Translation):* 

In my opinion, using the product is:

- difficult / easy
- illogical / logical
- not plausible / plausible
- inconclusive / conclusive

*Product Categories:* Relevant for nearly all product categories that are used to reach certain goals. Maybe less important for quite complex products, for example business software or programming tools, where users generally accept some initial effort to get familiar with the product. In such cases it is better to measure *Perspicuity*. We suggest using either *Intuitive Use* or *Perspicuity*.

# Value (Wertigkeit)

Semantic Interpretation: The user has the impression that the product is of high quality and professionally designed. The user can be proud of possessing the product or being a user of the product.

Source: Scale development is described in Schrepp & Thomaschewski (2019).

*Items (German – Original Version):* 

Die Gestaltung des Produkts wirkt auf mich insgesamt:

- minderwertig / wertvoll
- nicht vorzeigbar/ vorzeigbar
- nicht geschmackvoll / geschmackvoll
- nicht elegant / elegant

*Items (English Translation):* 

I generally consider the design of the product as:

- inferior / valuable
- not presentable / presentable
- tasteless / tasteful
- not elegant / elegant

*Product Categories:* Applies mostly to products with a graphical user interface or some visual control elements purchased by the user for his or her personal tasks (smart phones or other personal devices).

## Trustworthiness of Content (Inhaltsseriosität)

Semantic Interpretation: The user has the impression that the information provided by the product is of good quality and reliable. The user has trust in the information provided by the product.

Source: Scale development is described in Schrepp & Thomaschewski (2019).

*Items (German – Original Version):* 

Die Informationen und Daten, die mir das Produkt bereitstellt sind:

- nutzlos / nützlich
- unglaubwürdig / glaubwürdig
- unseriös / seriös
- ungenau / genau

Items (English Translation):

In my opinion, the information and data provided by the product are:

- useless / useful
- implausible / plausible
- untrustworthy / trustworthy
- inaccurate / accurate

*Product Categories:* Very important for information websites, news portals or educational software or other products that mainly transport information. In general, not relevant for tools that are used to create new content.

# Quality of Content (Inhaltsqualität)

Semantic Interpretation: The user has the impression that the information provided by the product is actual, well-prepared and easy to understand. It is interesting to read this information.

Source: Scale development is described in Schrepp & Thomaschewski (2019).

Items (German – Original Version):

Die Informationen und Daten, die mir das Produkt bereitstellt sind:

- veraltet / aktuell
- uninteressant / interessant
- schlecht aufbereitet / gut aufbereitet
- unverständlich / verständlich

*Items (English Translation):* 

In my opinion, the information and data provided by the product are:

- obsolete / up-to-date
- not interesting / interesting
- poorly prepared / well prepared
- incomprehensible / comprehensible

*Product Categories:* Very important for information websites, news portals or educational software or other products that mainly transport information. In general, not relevant for tools that are used to create new content.

## Trust (Vertrauen)

Semantic Interpretation: The user has the impression that his or her data entered into the product is in safe hands and not misused to harm him or her.

Source: Scale development is described in (Hinderks, 2016).

*Items (German – Original Version):* 

In Bezug auf die Verwendung meiner persönlichen Informationen und Daten ist das Produkt:

- unsicher / sicher
- unseriös / seriös
- unzuverlässig / zuverlässig
- intransparent / transparent

*Items (English Translation):* 

Regarding the use of my personal information and data, the product is:

- insecure / secure
- untrustworthy / trustworthy
- unreliable / reliable
- non-transparent / transparent

*Product Categories:* Especially important for products that deal with sensitive personal data (social networks, messengers, etc.) or commercial aspects (banking apps, web shops, etc.).

# Haptics (Haptik)

Semantic Interpretation: Describes the feelings which result from touching the product.

Source: Scale construction and evaluation is described in Boos & Brau (2017).

Die Oberfläche des Produkts empfinde ich als:

- instabil / stabil
- unangenehm anzufassen / angenehm anzufassen
- rau / glatt
- rutschig / rutschfest

*Items (English Translation):* 

In my opinion, the surface of the product is:

- unstable / stable
- unpleasant to the touch / pleasant to the touch
- rough / smooth
- slippery / slip-resistant

*Product Categories:* Only relevant for products that are touched during the interaction. Originally designed for household appliances.

## Acoustics (Akustik)

*Semantic Interpretation:* Describes the impact of sounds or operating noise of the product to the user experience.

Source: Scale construction and evaluation is described in Boos & Brau (2017).

*Items (German – Original Version):* 

Die beim Betrieb des Produkts entstehenden Geräusche sind:

- lärmend / leise
- missklingend / wohlklingend
- dröhnend / gedämpft
- schrill / sanft

*Items (English Translation):* 

The noise during use of the product is:

- loud / quiet
- dissonant / melodic
- booming / dampened
- piercing / soft

*Product Categories:* Only relevant for products that create some operating noise during the interaction. Originally designed for household appliances.

# Clarity (Übersichtlichkeit)

Semantic Interpretation: Describes the impression towards order, structure and visual complexity of a graphical user interface.

*Source:* Scale construction and evaluation is described in Otten, Schrepp & Thomaschewski, (2020).

*Items (German – Original Version):* 

Die Benutzeroberfläche des Produkts empfinde ich als:

- schlecht gegliedert / gut gegliedert
- unstrukturiert / strukturiert
- ungeordnet / geordnet
- unorganisiert / organisiert

Items (English Translation):

In my opinion the user interface of the product looks:

- poorly grouped / well grouped
- unstructured / structured
- disordered / ordered
- disorganized / organized

*Product Categories:* Relevant for all products that have a graphical user interface or are operated via a physical control panel.

## Response Behavior (Antwortverhalten)

Semantic Interpretation: Users expect that a voice system communicates like a human conversationalist. Thus, responses should be respectful, patient, polite, and trustworthy.

Source: Scale construction and evaluation is described in Klein, Hinderks, Schrepp & Thomaschewski (2020).

*Items (German – Original Version):* 

Meiner Meinung nach ist das Antwortverhalten des Sprachassistenten:

- künstlich / natürlich
- unangenehm / angenehm
- unsympathisch / sympathisch
- langweilig / unterhaltsam

*Items (English Translation):* 

In my opinion the response behaviour of the voice assistant is:

- artificial / natural
- unpleasant / pleasant
- unlikeable / likeable
- boring / entertaining

Product Categories: Only relevant for products that have a voice interface.

# Response Quality (Antwortqualität)

Semantic Interpretation: The responses of the voice system cover the user's information needs. Thus, answers are perceived as clear, distinct, and up-to-date; the queries match the context; and the user's intention is fulfilled.

Source: Scale construction and evaluation is described in Klein, Hinderks, Schrepp & Thomaschewski (2020).

*Items (German – Original Version):* 

Die Antworten und Fragen des Sprachassistenten sind:

- unpassend / passend
- nutzlos / nützlich
- nicht hilfreich / hilfreich
- unintelligent / intelligent

*Items (English Translation):* 

The answers and questions asked by the voice assistant are:

- inappropriate / suitable
- useless / useful
- not helpful / helpful
- unintelligent / intelligent

*Product Categories:* Only relevant for products that have a voice interface.

# Comprehensibility (Verständnis)

Semantic Interpretation: The user has the impression that the voice assistant correctly understands his or her instructions and questions using natural language. The intention of the user is recognized without forcing him or her to use an unnatural way of speaking.

Source: Scale construction and evaluation is described in Klein, Hinderks, Schrepp & Thomaschewski (2020).

Das Erkennen meiner Anweisungen und Befehle durch den Sprachassistenten ist:

- kompliziert / einfach
- ungenau / genau
- nicht eindeutig / eindeutig
- rätselhaft / erklärbar

*Items (English Translation):* 

In my opinion the voice assistant has understood my voice commands:

- complicated / simple
- inaccurate / accurate
- ambiguous / unambiguous
- enigmatic / explainable

*Product Categories:* Only relevant for products that have a voice interface.

# Result Quality (Ergebnisqualität)

Semantic Interpretation: Subjective impression that goals and diagnostic results are fully and accurately achievable by using the product.

Source: Scale construction and evaluation is described in Bögler (2022).

*Items (German – Original Version):* 

Die Ergebnisse, die sich mit dem Produkt/System erzielen lassen, empfinde ich als:

- uneindeutig / eindeutig
- nicht bedarfsgerecht / bedarfsgerecht
- inadäquat / adäquat
- unterdurchschnittlich / überdurchschnittlich

*Items (English Translation):* 

I find the results achievable with the product/system to be:

- ambiguous / unambiguous
- not needs-oriented / needs-oriented
- inadequate / adequate
- below average / above average

*Product Categories:* Complex medical devices, for example MRI or CT scanners, Radiography systems, Imaging Software.

## Hardware Security (Hardware Sicherheit)

*Semantic Interpretation:* Subjective impression concerning the hardware bearing risks, which might be hazardous to health.

Source: Scale construction and evaluation is described in Bögler (2022).

Anwendungsfehler und Risiken, die bei der Nutzung des Produkts entstehen können, empfinde ich als:

- bedrohlich / harmlos
- gesundheitsgefährdend / nicht gesundheitsgefährdend
- schädigend / nicht schädigend
- kollisionsbegünstigend / nicht kollisionsbegünstigend

Items (English Translation):

I find the application errors and risks which may arise when using the product to be:

- threatening / harmless
- hazardous to health / not hazardous to health
- damaging / not damaging
- likely to cause collision / unlikely to cause collision

*Product Categories:* Complex medical devices, for example MRI or CT scanners, Radiography systems, Imaging Software.

## Risk Handling (Risikohandhabung)

Semantic Interpretation: Subjective impression of the user that risks and errors can be identified and handled.

Source: Scale construction and evaluation is described in Bögler (2022).

*Items (German – Original Version):* 

Anwendungsfehler und Risiken, die bei der Nutzung des Produkts entstehen können, empfinde ich als:

- schwer erkennbar / leicht erkennbar
- nicht rechtzeitig rückgemeldet / rechtzeitig rückgemeldet
- schwer verständlich angezeigt / leicht verständlich angezeigt
- unaufhaltbar / aufhaltbar

*Items (English Translation):* 

I find the application errors and risks which may arise when using the product to be:

- hardly apparent / easily apparent
- not fed back in a timely manner/ fed back in a timely manner
- indicated in a manner which is difficult to understand / indicated in a manner which is easy to understand
- unstoppable / stoppable

*Product Categories:* Complex medical devices, for example MRI or CT scanners, Radiography systems, Imaging Software.

# Identification (Identifikation)

Semantic Interpretation: Subjective impression of users that using or owning a product has an impact on how they are perceived by others, i.e., that this improves or reduces their social status.

*Source:* Scale construction and evaluation is described in Mortazavi, Doyon-Poulin, Imbeau & Robert (2023).

*Remark:* This scale has a large semantic overlap with the scale Value. Value focusses a bit more on product qualities, Identification has a stronger focus on how owning or using a product impacts the self-perception. Do not use these scales together in a questionnaire. They look too similar, and this will maybe confuse participants.

Items (German Translation):

Meiner Meinung nach wirke ich durch die Verwendung oder den Besitz des Produkts:

- rückständig / modisch
- billig / stilvoll
- altmodisch / modern
- unprofessionell / professionell

*Items (English – Original Version):* 

In my opinion using/owning this product makes me look:

- old-fashioned / fashionable
- cheap / stylish
- out of date / modern
- unprofessional / professional

*Product Categories:* Products that are used to express some status value, for example stylish and expensive devices, or access to some expensive or restricted services or communities.

### Social Interaction (Soziale Interaktion)

Semantic Interpretation: Subjective impression of the user that the product supports social activities or helps to build social contacts.

*Source:* Scale construction and evaluation is described in Mortazavi, Doyon-Poulin, Imbeau & Robert (2023).

*Items (German Translation):* 

Meiner Meinung nach fühle ich mich durch die Verwendung des Produkts:

- von anderen isoliert / mit anderen kommunizierend
- nicht mit anderen zusammenarbeitend / mit anderen zusammenarbeitend
- anderen gegenüber ignorant / anderen helfend
- nicht einfühlsam / einfühlsam

*Items (English – Original Version):* 

In my opinion, by using the product I can:

- isolate from others / communicate with others
- not collaborate with others / collaborate with others
- be ignorant to others / be helpful to others
- not empathize with others / empathize with others

*Product Categories:* Products that are used to build or maintain social connections, for example, social networks, dating apps or collaborative games.

## Social Stimulation (Soziale Stimulation)

Semantic Interpretation: Subjective impression of the user regarding the anticipated social gains resulting from their interaction with a product.

*Source:* Scale construction and evaluation is described in Mortazavi, Doyon-Poulin, Imbeau & Robert (2023).

*Items (German – Translation):* 

Meiner Meinung nach ist die Verwendung des Produkts:

- sozial abschreckend / sozial unterstützend
- sozial entfremdend / sozial engagierend
- sozial neutral / sozial befähigend
- sozial ausschließend / sozial inkludierend

*Items (English – Original Version):* 

In my opinion the use of this product is:

- socially discouraging / socially encouraging
- socially disengaging / socially engaging
- socially neutral / socially empowering
- socially exclusive / socially inclusive

*Product Categories:* Products that are used to build or maintain social connections, for example, social networks, dating apps or collaborative games.

#### Social Acceptance (Soziale Akzeptanz)

Semantic Interpretation: Subjective impression of the user regarding how they are accepted and approved by others and themselves when using a product in a public environment.

*Source:* Scale construction and evaluation is described in Mortazavi, Doyon-Poulin, Imbeau & Robert (2023).

*Remark:* Only makes sense in the context of public usage of a product. That means if the product is used or shown in a situation in which other persons can watch the user by interacting or simply wearing the product (for example, a smart watch or Google Glass).

*Items (German – Translation):* 

Meiner Meinung nach fühle ich mich in sozialen Situationen, wenn ich das Produkt verwende:

- von anderen negativ beurteilt / von anderen akzeptiert
- von anderen zurückgewiesen / von anderen anerkannt
- peinlich berührt / stolz
- unwohl / wohl

*Items (English – Original Version):* 

In my opinion, using this product in social situations makes me feel:

- judged by others / approved by others
- rejected by others / accepted by others
- embarrassed / proud
- uncomfortable / comfortable

*Product Categories:* Products used in situations where other persons are present and can observe the interaction of the user with the product.

# How to find the relevant scales for my use case?

If a scale is relevant for a certain product and should thus be measured in an evaluation depends on two independent sources of information.

First, obviously UX aspects that are important by users of the product should be considered. A suggestion which aspects are relevant depending on the product type can be derived from existing research (Winter, Schrepp & Thomaschewski, 2015; Winter, Hinderks, Schrepp & Thomaschewski, 2017 or Schrepp, Kollmorgen, Meiners, Hinderks, Winter, Santoso, & Thomaschewski, 2023).

This research is resulting in the following concrete suggestion (Schrepp, 2018, 2021). The results concerning complex medical devices are described in Bögler (2022).

Product Category	Relevant Scales
Word Processing	Dependability, Usefulness, Efficiency, Clarity, Perspicuity
Spreadsheet	Usefulness, Dependability, Efficiency, Perspicuity, Clarity
Messenger	Trust, Intuitive Use, Dependability, Efficiency, Identity
Social Networks	Trust, Identity, Dependability, Intuitive Use, Stimulation, Quality of
	Content, Trustworthiness of Content
Video Conferencing	Trust, Dependability, Efficiency, Intuitive Use, Usefulness
Web Shops	Trust, Quality of Content, Trustworthiness of Content, Dependability,
	Clarity, Value, Intuitive Use, Visual Aesthetics
News Portals	Quality of Content, Content Reliability, Clarity
Booking Systems	Trust, Dependability, Quality of Content, Trustworthiness of Content,
	Efficiency, Clarity, Intuitive Use, Value, Usefulness
Info-Web-Sites	Content Quality, Trustworthiness of Content, Clarity
Learning Platforms	Quality of Content, Trustworthiness of Content, Usefulness, Clarity,
	Perspicuity, Efficiency, Trust, Dependability

Programming Tools	Dependability, Usefulness, Efficiency, Adaptability, Clarity, Perspicuity				
Drawing Tools	Dependability, Usefulness, Efficiency, Adaptability, Clarity, Perspicuity				
Online-Banking	Trust, Dependability, Quality of Content, Trustworthiness of Content,				
	Value, Clarity, Intuitive Use, Efficiency, Usefulness				
Video Portals	Intuitive Use, Immersion, Clarity, Quality of Content, Trustworthiness of				
	Content, Trust				
Games	Immersion, Stimulation, Visual Aesthetics, Novelty, Dependability,				
	Intuitive Use				
Household Appliances	Usefulness, Intuitive Use, Efficiency, Haptics, Acoustics				
Complex Medical	Dependability, Efficiency, Usefulness, Clarity, Result Quality, Trust, Risk				
Devices	Handling, Hardware Security, Perspicuity, Trustworthiness of Content				

Some of the suggested scales (*Identity, Immersion*) are currently not available in the UEQ+. These are displayed in italics. The order in which the scales are listed reflects the importance ratings obtained in some experimental investigations.

Of course, it may not be possible to assign each concrete product to one of those categories. A fitting category may simply not be listed, or a concrete product may contain aspects from more than one category. But such a list is a first hint what to consider.

In each case it is a good idea to set up a small study to confirm the selected UX aspects concerning their relevance with some small sample of users or by discussing this choice with some experts that know the product and the typical user base quite well. An individual product may have some special characteristics that cause some deviations from the suggested scales in the table above.

As a second source of information, it is important to consider aspects, that are maybe not so relevant for users of the product but are essential for marketing and product placement. If a new product should be presented on big events with product demonstrations in front of big audiences, then of course the visual appearance of the product is quite important, since it sets the first impression of the product and may have thus an impact on buying decisions. Thus, it would be wise to measure this aspect as well. If such aspects should be measured and which aspects are relevant depends on the concrete situation and must be discussed with the relevant experts in the company.

# Data analysis with the UEQ+

There is a data analysis tool available for download on the UEQ+ homepage. Simply enter the observed data into the tool (it is an MS Excel). All relevant calculations are then automatically done. The handling of the data analysis tool is described inside the tool.

# Frequently asked questions

#### How many scales should I include into a questionnaire created with the UEQ+?

To keep the length of the questionnaire in a reasonable range we suggest not to select more than 5 or 6 scales. Especially if the questionnaire is used as an Online-Questionnaire it is important to keep it short to get a reasonable response rate. If you feel that you urgently

need to measure more than 6 scales it is maybe an option to split them into two shorter questionnaires.

### What is the role of the importance ratings?

In the UEQ+ each scale contains a rating concerning the importance of the scale. For example, for the scale efficiency:

To achieve my goals, I consider the product as								
slow	0	0	0	0	0	0	0	fast
inefficient	0	0	0	0	0	0	0	efficient
impractical	0	0	0	0	0	0	0	practical
cluttered	0	0	0	0	0	0	0	organized
I consider the product property described by these terms as								
Completely irrelevant	0	0	0	0	0	0	0	Very important

The importance ratings are used to calculate a KPI, i.e. a single number that should represent the overall UX quality of the product. The detailed KPI calculation is similar to the KPI calculation in the original UEQ, see Hinderks, Schrepp, Domínguez Mayo, Escalona & Thomaschewski (2019).

If you are only interested in the scale values and not in such a KPI, then simply drop the importance ratings from the questionnaire to keep it short.

How to define short forms of a UEQ+ by dropping some items is described in Schrepp, Sandkühler & Thomaschewski (2021).

#### Why is the scale format of the UEQ+ different from the UEQ?

The UEQ contains 6 fixed scales. Thus, it is possible to randomize the order of the items in the questionnaire. In addition, the polarization of the items in the original UEQ is randomized. Half of the items show the positive term left (fast o o o o o o o slow) and the other half right (boring o o o o o o exciting).

Since scales can be combined and some of the terms are quite similar or even identical in the different scales it was necessary to group all items of a scale together and set some context for the correct interpretation of the terms. This is done by introducing the short sentence that is shown on top of the items of a scale.

If you choose a combination of scales that are represented by quite distinct items (please check that carefully) you can drop the introductory sentences and use a format like in the original UEQ. We recommend not to randomize the order of the items, since this will make the usage of the data analysis sheet more difficult.

## Can I compare scale scores measured with the UEQ+ to original UEQ scores?

The six original UEQ scales are also contained in the UEQ+. But for the reasons described above the scale format is different in both questionnaires. This immediately raises the questions if results obtained with both questionnaires can be compared.

Assume, for example, that you have evaluated your product in the past with the UEQ and the scale value for *Efficiency* was 1.2. Now you get new data for this product from an application of the UEQ+ and your *Efficiency* score increased to 1.4. Assume that the difference is statistically significant. But can you really conclude that your product improved concerning *Efficiency*?

Currently we would not recommend comparing scale values obtained with both questionnaires! The changed scale format can have an impact on the results. Thus, you can in the example above not rule out that the increase in *Efficiency* was not due to a real quality improvement of the product, but simply resulted from the changed polarity, order and the introductory sentence in the UEQ+ scale.

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