UEQ+ A Modular Extension of the User Experience Questionnaire

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

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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 www.ueq-online.org.

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 www.ueq-online.org). 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. 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.

Products used to work on clearly defined tasks		
Efficiency	Subjective impression that tasks can be finished without unnecessary effort.	Products that help users to reach specific goals by solving a number of tasks in the product. For example business software, spreadsheets, programming tools, tools for image processing, word-processors, presentation software, booking systems, webshops, household appliances, etc.
Usefullness	Subjective impression that using the product is beneficial.	
Perspicuity	Subjective impression that it is easy to learn how to use the product.	
Adaptability	Subjective impression that the product can be easily adapted to personal preferences or working styles.	
Dependability	Subjective impression to be in control of the interaction with the product.	
Intuitive use	Subjective impression that the product can be used immediately without any training or help.	
Products with a graphical user interface		
Visual Aesthetics	Perception that the graphical user interface of the product looks beautiful and appealing?	Products that can be operated over a graphical user interface or some physical control elements. Does not apply for products that communicate with the user purely over voice or that do not offer any visual feedback to the user.
Clarity	Perception that the user interface is well-structured and of low visual complexity.	
Value	Impression that the product design looks professional and valuable.	

Products that transport content or knowledge		
Trustworthiness of Content	Subjective impression that the information provided by the product of good quality and reliable.	Websites that provide informations about organizations or certain topics, News Portals, Online Journals, Learning Software.
Quality of Content	Subjective impression that the information provided by the product is actual and well-prepared.	
Products that interact with the user over voice		
Response behavior	Subjective impression that the voice assistant behaves respectful and trustworthy.	Voice assistants like Alexa or Siri, products that interact with the user over voice.
Response quality	Subjective impression that the responses of a voice assistant cover the user's information needs.	
Comprehens-ibility	Subjective impression that the voice assistant correctly understands the users' instructions and questions using natural language.	
Household appliances		
Haptics	Subjective feelings resulting from touching the product.	Household appliances with at least a simple user interface or physical control panel.
Acoustics	Subjective experience concerning the sounds or operating noise of the product.	
Complex medical devices		
Result Quality	Can goals and results be fully and accurately achieved by using the product?	Complex medical equipment, for example, MRI or CT scanners, radiography systems, imaging software, etc.
Hardware Security	Does the hardware bear risks, which might be hazardous to health?	
Risk Handling	Can users identify and handle risks and errors?	
Products that handle sensitive data		
Trust	Subjective impression of the users that their data are in safe hands and are not misused to harm them.	Online banking, eCommerce, Social Networks, Messengers.
Scales that apply to all products		
Stimulation	Impression that it is interesting and fun to use the product.	These scales can be applied to all types of products.
Novelty	Impression that the product design or product idea is creative and original.	
Attractiveness	Overall impression concerning the product. Do users like or dislike it?	

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.

Items (German – Original Version):

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
- organized / cluttered

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.

Items (German – Original Version):

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).

Items (German – Original Version):

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).

Items (German – Original Version):

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).

Items (German – Original Version):

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).

Items (German – Original Version):

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.

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 Devices	Dependability, Efficiency, Usefulness, Clarity, Result Quality, Trust, Risk Handling, Hardware Security, Perspicuity, Trustworthiness of Content

Some of the suggested scales (*Identity*, *Immersion*, *Clarity*) 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	○	○	○	○	○	○	○	fast
inefficient	○	○	○	○	○	○	○	efficient
impractical	○	○	○	○	○	○	○	practical
cluttered	○	○	○	○	○	○	○	organized
I consider the product property described by these terms as								
Completely irrelevant	○	○	○	○	○	○	○	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 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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