

**Evaluating End-user Documentation from a Minimalist
Perspective: a Heuristic Evaluation of Two Smart Watch User
Manuals**

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<p>Abstract</p> <p>Teknologian nopea kehittyminen viimeisten vuosikymmenten aikana on muuttanut ihmisten päivittäistä elämää merkittäväällä tavalla ja erilaisten teknologioiden ja laitteiden käyttämisestä on tullut osa niin vapaa-aikaa kuin työelämää. Samalla myös laadukkaan käyttäjädokumentaation, kuten käyttöohjeiden, verkossa julkaistavien ohjeiden sekä verkkosivujen, tuottamisesta erilaisille kohderyhmille on tullut entistä tärkeämpää. Tämän tutkimuksen tavoitteena on tarkastella käyttäjädokumentaatiota ja arvioida sen laatua minimalismin näkökulmasta, joka on käyttäjälähtöinen ja toimintaorientoitunut lähestymistapa dokumentaation kehittämiseen.</p> <p>Tutkimuksen aineisto kerättiin kahden eri älykellon käyttöohjeesta: Samsungin Galaxy Watch -kellon sekä Applen Apple Watch -kellon ohjeesta. Aineisto koostui yhteensä 72 sivusta, jotka keskittyivät kellojen perustoimintoihin vertailun helpottamisen vuoksi. Käyttöohjeiden laadun arviointia varten suoritettiin heuristinen arviointi hyödyntäen Virtualuodon, Suojasen ja Isohellan (2021) minimalismiheuristiikkoja. Analyysin tavoitteena oli selvittää, (1) millä tavalla käyttöohjeet noudattavat minimalismin periaatteita ja (2) mitä eroja arviointi paljastaa käyttöohjeiden välillä. Analyysi osoitti, että molemmista käyttöohjeista on havaittavissa piirteitä, jotka noudattavat minimalismin periaatteita, mutta erityisesti Samsungin ohjeessa esiintyi ongelmia. Ongelmat liittyivät erityisesti sisällön määrään sekä jäsentelyyn ja lisäksi erilaisten symbolien käyttö oli epä johdonmukaista.</p> <p>Vaikka tutkimusten mukaan dokumentaation laadulla voi olla merkitystä käyttäjien mielipiteeseen tuotteesta sekä yrityksestä, analyysin tulokset osoittivat, että eri valmistajien käyttöohjeiden välillä voi olla huomattavia eroja niiden laadussa, erityisesti kun niitä tarkastellaan minimalismin näkökulmasta. Tätä tutkimusta on näin ollen mahdollista hyödyntää manuaalien laadun parantamisessa ja varmistamaan, että ne ovat mahdollisimman käyttäjäystävällisiä. Tutkimusta voi käyttää esimerkkinä siitä, miten manuaalien laatua voi arvioida merkittävimpien ongelmien löytämiseksi.</p>	
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1 INTRODUCTION

In the last few decades, the rapid development of technology has changed every aspect of people's lives, from the way they work to how they spend their free time. Being able to use different technological devices has become an essential skill. At the same time, the importance of providing users with good quality technical documentation has increased. Technical documentation can take the form of several types of output media, such as user manuals, online help applications, websites and even web 2.0 media like blogs, podcasts and discussion forums (Cleary & Slattery, 2018, p. 310). Though it is generally thought that users do not tend to read manuals and therefore it is easy to believe that the quality of the provided manuals and instructions does not matter, studies have shown that users tend to reach for them in instances where they are unfamiliar with the product at hand, or the task is particularly challenging (Gök, Ersoy & Börühan, 2019, p. 475-476). On a larger scale, companies can benefit from providing good quality documentation, since the way the users perceive the company can be affected by the quality of the documentation (Schriver, 1993, p. 246).

The expansion of software industries in the 1980s led to the increasing need to provide documentation to users (Cleary & Slattery, 2018, p. 307). This also meant that new ways of creating the documentation were needed. The existing documentation often did not accommodate users' different learning styles and strategies and as a response *minimalism* was developed by John M. Carroll in 1990. Minimalism is a

concept for creating user instruction that is heavily user-centered and action-oriented (van der Meij & Carroll, 1995) and while it has been a major trend in the field of technical communication since it was originally created, there is very little recent literature focusing on the practical applications of minimalism (Virtaluoto, Suojanen & Isohella 2021). Therefore, this thesis intends to fill in the research gap for its part as a practical application of minimalism. In this thesis I examine two smart watch user manuals, one from Samsung and one from Apple. By conducting a heuristic evaluation using the minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021) I aim to describe and evaluate the quality of the documentation of these companies.

In the following chapters I first start by defining the relevant theoretical framework, in which I discuss the importance of documentation quality as well as the possible way to define it, followed by an overview of minimalism, minimalism heuristics and heuristic evaluation. In the Present study chapter, the aims and research questions are presented, and the data is introduced. This is followed by the results of the evaluation and lastly, in the Discussion and Conclusion chapter the results are summarized and discussed.

2 THEORETICAL FRAMEWORK

2.1 Why documentation quality matters

When it comes to user manuals and other help systems, the consensus seems to be that consumers rarely reach for them when encountering a problem or learning to use a new application or device. This notion is supported by research into the topic. For example, Novick and Ward (2006b) conducted a study that aimed to describe how users solve the usability problems they encounter and whether they tend to avoid manuals and online help systems. They interviewed a diverse set of people from various educational and professional backgrounds, who frequently used computers in their work. The results showed that the users do, in fact, tend to avoid both paper and online help systems and while the users were more likely to consult online help, they were equally likely to ask help from colleagues or experiment on their own to solve the problem. On average, the participants reported that they are more likely to avoid the task altogether rather than use printed manuals. However, Gök, Ersoy and Börühan (2019, p. 475-476) point out that results of the existing research into the topic are conflicting: while consumers are more likely to use trial-and-error practices and other less effective methods, the general conclusion of the studies is that users tend to consult manuals especially with products that are complex and high-value or that they are unfamiliar with.

Only a limited number of studies have investigated the impact of documentation quality to the consumers' perceptions of the product quality and customer satisfaction (Gök, Ersoy & Börühan, 2019, p. 476), though there are several reasons why the quality of the user manual is important to both the companies and consumers. In post-purchase occasions, the user manual can potentially influence the consumers quality perceptions related to the product and thus have an impact on the overall satisfaction with the purchase (Gök, Ersoy & Börühan, 2019, p. 476). Users' perception about the quality of the manuals can even affect their view of an organization's products, customer service and the company itself (Schrivver, 1993, p. 246).

According to Gök, Ersoy & Börühan (2019, p. 476), a user manual can be considered as a communicative dimension of a product, and it can be included in the product management strategy of the company. By providing users with good quality manuals, the company can reduce any losses and damages caused by misuse of the product, and it can potentially improve the product's overall performance. A user manual can also be seen as an extension of the actual product and as such, high quality manuals have the potential to lessen customer support costs by making the product easier to install, use and maintain.

2.2 Defining the quality of documentation

As established in the previous section, the quality of the documentation provided to consumers can impact how satisfied they are with purchases they have made as well as impact their view of the overall quality of the products and even their view of the manufacturers. Understanding what is meant by "quality" in the context of user manuals is essential when it comes to improving documentation, but there are a multitude of issues when trying to create a single definition for the term. Schrivver (1993, p. 241-242) has pointed out that the problem with most literature focused on the topic of quality is that it does not clearly state what is meant by quality or specify explicit criteria and methods for measuring the success of creating quality

documentation. There are numerous possible definitions for quality, though what is common with these definitions is that they all point to the user being the one to determine what quality is and is not (Strimling, 2019, p. 10). This is true particularly with documentation because it is “always written for a potential audience and must always keep their needs in mind” (ibid.).

Strimling (2019) has summarized the many possible definitions of documentation quality. Many of these definitions describe high quality documentation as clear, concise and easy to use, with information that is accurate, relevant and easy to understand. Strimling (2019) discusses a number of issues with the definitions of documentation quality. First, many of the traits used to describe what documentation quality is are vague and can be defined in many ways. Secondly, some of these quality traits are difficult to objectively measure. Lastly, he concludes that the multitude of definitions for documentation quality itself is a problem and though different definitions are suitable in different contexts and for different readers, it is not likely that there are significant changes in the definitions without any overlap between them.

Despite the challenges of composing a definition for good quality documentation, there are certain aspects that seem to arise as the most crucial characteristics in different studies. For example, Strimling (2019) aimed to build a comprehensive definition of documentation quality and determine what attributes users find to be the most important aspects of documentation quality by conducting a survey based on Wang and Strong’s (1996) data quality framework. The survey revealed four dimensions that people think are the most important for good quality documentation: the Accurate information quality dimension, the Relevant information quality dimension, the Easy to Understand information quality dimension and the Accessible information quality dimension. In addition, Alchimowicz and Nawrocki (2016) have presented the COCA quality model, which consists of four quality characteristics: Completeness, Operability, Correctness and Appearance. Like Strimling (2019), they assume that it is the end user’s point of view from which the documentation is

evaluated and there are significant similarities between these two models which will now be explored in more detail.

Notable similarities can be found between the Accurate information quality dimension, which Strimling (2019, p. 20) defined in the survey as “the information in the documentation is correct, reliable, and certified free of error” and Correctness, which is defined by Alchimowicz and Nawrocki (2014, p. 209) as “the degree to which the descriptions provided by the user documentation are correct”. The Easy to Understand information quality dimension and the Operability quality characteristic have a significant resemblance to each other as well. Strimling (2019, p. 21) defined the Easy to Understand quality dimension as “the information in the documentation is clear, without ambiguity, and easily comprehended” in the questionnaire while Alchimowicz and Nawrocki (2014, p. 209) provide two possible definitions for Operability: “the degree to which user documentation has attributes that make it easy to use and helpful when acquiring information that is contained in the user documentation” and “the degree to which user documentation has attributes that make it easy to use and helpful when operating the software documented by it”.

In addition to these, a certain degree of similarity can be found between Operability and the Relevant information quality dimension, which Strimling (2019, p. 20) defined in the questionnaire as “the information in the documentation is applicable and helpful for the task at hand”. The Accessible information quality dimension, which Strimling (2019, p. 22) defined as “the information in the documentation is available or easily and quickly retrievable” does not have a direct equivalent in the COCA quality model. Similarly, the Completeness and Appearance quality characteristics in the COCA model do not have direct equivalents with Strimling’s model. Alchimowicz and Nawrocki (2014) define Completeness as “the degree to which user documentation provides all the information needed by end users to use the described software” (p. 208) and Appearance is defined as “the degree to which information contained in user documentation is presented in an aesthetic way” (p. 209).

These same elements are central in minimalism, which is the main framework of this present study, as well. This is true especially when comparing these two models to the minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021). According to the heuristics the information in the documentation should be relevant to the user's tasks and the content in a manual should be structured and written in a way that makes the information easy to understand and accessible. Therefore, from Strimling's (2019) model, the Relevant, Easy to Understand and Accessible information quality dimension have notable similarities with the minimalism heuristics. It is important to note, though, that accessibility is understood much more broadly in Virtaluoto, Suojanen and Isohella's (2021) minimalism heuristics than in Strimling's (2019) definition. Accessibility in the heuristics includes the overall content and findability, understandability of information as well as visual elements, while in Strimling's definition it is understood more as an easy access to the documentation.

Because of the focus on accessibility as well as the emphasis on real-life core tasks in the minimalism heuristics, the Operability quality characteristic from Alchimowicz and Nawrocki's (2014) model, which is the extent to which the documentation is easy to use and helpful when searching for information or operating the software the documentation applies to, has similarities with minimalism. To an extent, the Appearance quality characteristic has similarities with minimalism as well, even though aesthetic appearance as such is perhaps not focused on in the minimalism heuristics but the importance of the way in which the information is presented is highlighted. Minimalism is discussed in more detail in sections 2.3, 2.4 and 2.5.

2.3 Minimalism and the original minimalism heuristics

Minimalism is a "user-centered, contextual, and action-oriented concept for creating customer documentation" (Virtaluoto, Suojanen & Isohella, 2021, p. 21) and it has had a notable role in the field of technical communication since the 1990s (Lanier, 2018; Hackos, 2018, as cited in Virtaluoto, Suojanen and Isohella 2021, p. 21). The origins of

minimalism are, however, in the 1980s. Previously, the access to computers had largely been limited to programmers and other computer professionals, but the use of computers started to expand rapidly to people in other professions as well (Carroll 1990, p. 4). These people often experienced difficulties and though the complexity of computer applications could explain this to an extent, much of the problem was connected to the education that new users were being provided with (Carroll 1990, p. 4). This led to the development of new kinds of user instructions that were based on a so-called *systems approach*, where instead of alphabetical lists, the instructions consisted of structured lessons and exercises. The problem with these materials was that they required users to proceed through step-by-step sequences, which conflicted with users' different learning styles and strategies: in practice, the progress was frequently interrupted by instances of user-initiated problem solving and users tended to ignore steps and sections that seemed irrelevant to them. To solve this problem and to accommodate the different learning styles, John M. Carroll (1990) created minimalism.

Van der Meij and Carroll (1995) developed a set of principles and their corresponding heuristics that can be used to create minimalist instruction. The four principles are 1) Choose an action-oriented approach, 2) Anchor the tool in the task domain, 3) Support error recognition and recovery, and 4) Support reading to do, study and locate. Their list of heuristics can be seen in Table 1. They emphasize that the principles and heuristics are meant to be seen as guidelines instead of strict rules to be followed and though they are primarily intended to be used when developing instruction for novice users, they are suitable for creating instruction in general for different audiences and purposes.

Table 1. Minimalism principles and heuristics by Van der Meij and Carroll (1995, p. 245)

Principle 1: Choose an action-oriented approach	
Heuristic 1.1	Provide an immediate opportunity to act.
Heuristic 1.2	Encourage and support exploration and innovation.
Heuristic 1.3	Respect the integrity of the user's activity.
Principle 2: Anchor the tool in the task domain	
Heuristic 2.1.	Select or design instructional activities that are real tasks.
Heuristic 2.2	The components of the instruction should reflect the task structure.
Principle 3: Support error recognition and recovery	
Heuristic 3.1	Prevent mistakes whenever possible.
Heuristic 3.2	Provide error-information when actions are error-prone or when correction is difficult.
Heuristic 3.3	Provide error-information that supports detection, diagnosis and recovery.
Heuristic 3.4	Provide on-the-spot error-information.
Principle 4: Support reading to do, study and locate	
Heuristic 4.1	Be brief; don't spell out everything.
Heuristic 4.2	Provide closure for chapters.

The first principle, *choose an action-oriented approach*, is based on the assumption that people learning a new skill want to do something meaningful and are eager to act (Van der Meij and Carroll, 1995). Minimalist instruction is, therefore, always action oriented and should provide an immediate opportunity for the user to act by balancing the amount of explanatory content with realistic activity. In addition, it should encourage and support the user's exploration and innovation while respecting the user's activity. In contrast to conventional manuals, which tend to emphasize the declarative (conceptual) aspect of a program, minimalism is focused on the procedural (action) part of a program (Van der Meij, 1992, p. 8). The text in a minimal manual is, in a way, written around the skills the users are supposed to develop and all the information that is not necessary for completing tasks is left out (Van der Meij, 1992, p. 10). Instead of beginning with an explanation of how an application works, which may be a distraction to the reader, an alternative approach is to give the reader more to do by presenting a simple task which at the same time includes some explanatory content (Van der Meij and Carroll, 1995, p. 244-245).

According to the second principle, *anchor the tool on the task domain*, instructional activities that are selected or designed for minimalist instruction should be real tasks and the components of the instruction should reflect the structure of the task (Van der Meij and Carroll, 1995). The creators recommend that the instructional activities presented to the user can immediately be recognized as genuine, though it is necessary to consider that users can only recognize an activity as genuine based on their prior experience with the task domain. The instructions must therefore build on the users' prior skills, knowledge and experience (Van der Meij and Carroll, 1995). Structurally, the manual should have logical headings that clearly reflect the central procedural elements of the tasks.

The third principle, *support error recognition and recovery*, is focused on minimizing the number of mistakes made and offering opportunities for users to correct the mistakes they do make. Van der Meij and Carroll (1995, p. 251) distinguish three different categories of errors: *semantic errors*, which occur when users cannot possibly achieve

a goal with the method they have chosen, *syntactic errors*, which occur when the right method is chosen but it is not performed correctly and *slips*, which can occur, for example, when making a mistake when typing a name of a file the user is searching for. They note that when it comes to the minimalist philosophy of providing users with less information, it is often recommended that more than the bare minimum of error information is included. Enough error information should be included to prevent mistakes whenever possible and error information should be provided particularly when actions are error-prone or when making corrections is difficult. The instruction should provide error information that supports the detection, diagnosis and correction of mistakes and the information should be provided on-the-spot, instead of in a separate section at the end of the manual (ibid.). Since mistakes can have a strong effect on the users' emotions and the fact that users frequently make mistakes and dealing with them may take a significant amount of time, supporting error recognition and recovery is important (Van der Meij & Carroll, 1995, p. 250; Van der Meij, 2003, p. 227).

The fourth principle, *support reading to do, study, and locate*, addresses the various ways people read manuals, as often they do not process a manual systematically from beginning to end (Van der Meij & Carroll, 1995). Only a small group of users process a manual in a completely linear way and instead they might browse through it in a more random way, or they might only use the manual as a last resort, looking for specific instructions to help them (ibid.). To support the users' different strategies when reading a manual as much as possible, Van der Meij and Carroll (1995, p. 256-257) explain that minimalist instruction should be brief and not spell out everything. Things that can easily be inferred should be left out and the chapters should be relatively short so that they can be worked through quickly. In addition, closure should be provided for chapters in the manual to make them as independent as possible.

2.4 Revised minimalism heuristics

Based on the heuristics introduced by Van der Meij and Carroll (1995), Virtaluoto, Suojanen and Isohella (2021) have developed a revised set of minimalism heuristics, with the aim to start developing a strategy to help apply minimalism in practice. They used minimalism as a framework for a training program they organized for Finnish technical communicators in 2017-2018 and they state that while many had heard the term it became apparent early on that being able to use the principles of minimalism in practice required concrete, agile tools. In their article minimalism is placed in modern-day context, which is very different from the time when minimalism was originally developed. In the changing landscape of technical communication, there is a need for flexible, low-cost solutions to produce good quality documentation (Virtaluoto, Suojanen & Isohella, 2021, 20).

In Virtaluoto, Suojanen and Isohella's (2021) minimalism heuristics the original heuristics by Van der Meij and Carroll (1995) are extended and reorganized into new categories and instead of four categories, they have divided their heuristics into three categories: 1. *Core-tasks and Goal-Oriented*, 2. *Accessibility* and 3. *Error Management*. From the original heuristics, Principle 1: Choose an action-oriented approach and 2: Anchor the tool in the task domain, are extended particularly in the first category of Virtaluoto, Suojanen and Isohella's (2021) heuristics. According to the first category, the documentation should focus on the user's core tasks, and it should include relevant and targeted information that allows the user to start working on the tasks immediately as well as helps the user complete the tasks successfully.

The second category of the revised heuristics extends Principle 3: Support error recognition and recovery and 4: Support reading to do, study and locate from the original heuristics. The second category helps review the content of the documentation, the findability and understandability of information as well as the visual elements of the documentation. The documentation should be as concise as possible and only relevant content should be included. The overall structure should

be logical and allow the user to easily find what they are looking for. The information should be arranged in a way that is easy to understand and the visual elements, such as graphics, images or videos, should be relevant and connected to the text in the documentation. A notable difference between the original heuristics by Van der Meij and Carroll (1995) and the new heuristics by Virtaluoto, Suojanen and Isohella (2021) is the inclusion of visual elements, which were not considered in the original heuristics.

Principles 3 and 4 in the original heuristics are further extended in the third category of the revised heuristics, which is focused on error management. The documentation should help prevent errors and offer relevant information about how to recognize and solve possible errors to the users. The documentation should take into account the relevant safety standards and the necessary warnings should be placed next to the procedure they apply to. Lastly, the documentation should include a troubleshooting section that addresses the most common problems that users often face. The revised heuristics by Virtaluoto, Suojanen and Isohella (2021) are presented in their entirety in Table 2.

The revised minimalism heuristics are meant to work with the minimalist documentation process developed by Virtaluoto, Suojanen and Isohella (2018). The documentation process model was developed from the perspective of both the user and the technical communicator, and it is meant to help ensure that the user is taken into consideration in every step of the process. Virtaluoto, Suojanen and Isohella (2021) emphasize that the heuristics are meant to be seen as an evaluation that can be used in the different phases of the documentation process and are intended to be modified as needed, to suit the objectives of different companies, products and users.

Table 2. Minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021, p. 27-28).

MINIMALISM HEURISTICS	
1. CORE TASKS AND GOAL-ORIENTATION	
Core tasks	1.1. Does the documentation concentrate on the user's core tasks?
	1.2. Does the documentation reflect the real-life structure of each task?
	1.3. Does the documentation explain why the task is done, in addition to how?
Getting to work immediately	1.4. Can the users start working on real-life tasks immediately? If the documentation contains general information, prefaces, or introductory information before the steps, is the information concise and necessary?
Immediate assistance	1.5. Is the documentation available when needed?
	1.6. Does the user get targeted instructions at the relevant touch points on the user journey?
2. ACCESSIBILITY	
Content	2.1. Is the documentation as concise as possible in its overall selection of contents?
Findability	2.2. Is the overall structure of the documentation logical and consistent? Are all topics/sections structured in the same way?
	2.3. Do the users find what they are looking for? Does the documentation contain: <ul style="list-style-type: none"> • a clear and precise table of contents • a clear and intuitive index • clear, intuitive headings and keywords • an accessible and intuitive search functionality for online or electronic documentation?
Understandability	2.4. Is the information in the documentation easy to understand? Does the documentation contain: <ul style="list-style-type: none"> • long tasks broken into shorter sequences • clear, action-oriented steps • short, simple sentences • verb forms relevant to the information type • terminology that is appropriate to the user group • clear, simple language?
Visuals	2.5. Is the documentation visual?

	<ul style="list-style-type: none"> • Have graphics, images, videos, etc., been used where appropriate? • Are the visuals relevant? • Are the visuals used consistently? • Are the visuals clear and readable both online and in print? • Are the visuals clearly labelled (titles, figure numbers, etc.)? • Are the images and text in the documentation clearly connected using callouts, for example?
3. ERROR MANAGEMENT	
Preventing errors	3.1. Have errors been prevented?
Warnings and notes	3.2. Have all the applicable safety standards and legislation (e.g. the machinery Directive) been taken into consideration in the documentation?
	3.3. Are all the warnings and notes necessary?
	3.4. Are the warnings and notes located next to the relevant procedure?
Error recognition	3.5. Does the documentation offer error information: recognition, diagnosis, solution?
	3.6. Is the error information located close to the relevant procedure?
Troubleshooting	3.7. Does the documentation contain a troubleshooting section? <ul style="list-style-type: none"> • Is the troubleshooting section clearly visible in the table of contents? • Does the troubleshooting section contain the problems most often faced and/or reported by the users of the product?

2.5 Recent research on minimalism

Virtaluoto, Suojanen and Isohella (2021) state that even though there has been a long-standing interest in minimalism, there is a lack of recent research that is focused on minimalism and its practical applications. They searched for minimalism articles published between 2014-2019 from the following six technical communication journals: *IEEE Transactions on Professional Communication*, *Information Design Journal*, *Journal of Business and Technical Communication*, *Journal of Technical Writing and Communication*, *Technical Communication* and *Technical Communication Quarterly*. The

search yielded no results. For the purposes of this study, I decided to investigate, if the situation had changed after Virtaluoto, Suojanen and Isohella's (2021) search, and checked, if articles focusing on practical applications of minimalism had been published between 2019-2024.

In my search I found only one minimalism article, written by Heinonen, et al (2022). The article reports the results of an exploratory study that was conducted to test the delivery of technical instruction that was created using the principles of minimalism and the aim was to examine how the target users could be supported in a way that takes into consideration their skill-levels, utilizing DITA semantic tagging. DITA (Darwin Information Typing Architecture) is a "technical documentation and publishing architecture that is based on principles of modular reuse and extensibility" (Priestley, Hargis & Carpenter, 2001 p. 352). The study by Heinonen et al. (2022) was conducted in response to the challenges posed by the changing landscape of industrial maintenance, where the work of maintenance technicians is going through dramatic changes: instead of technicians continually working with certain equipment and learning how to do the necessary tasks with no instructions, the maintenance tasks now vary from day to day and between various pieces of equipment and the need to provide instructions for the experts has increased. The results of the study indicate that utilizing DITA can be helpful when targeting information to different skill levels.

Though there were no other journal articles focused on minimalism published between 2019-2024, the minimalism heuristics introduced by Virtaluoto, Suojanen and Isohella (2021) were the subject of an evaluation in a master's thesis by Pöyhönen (2023). In her thesis, she evaluated the usability of the minimalism heuristics in the context of heavy machinery user instructions, as opposed to the software instructions that they have more commonly been used for. To test the suitability of the heuristics, she conducted a heuristic evaluation using the minimalism heuristics on a hydraulic excavator manual. The results showed that while the heuristics are, for the most part, suitable, issues were found especially in the application of the heuristics in the Core tasks and goal-orientation category, which Pöyhönen (2023, p. 48) describes as "the

most software-centric category". Therefore, some modifications are needed to be able to use the heuristics to evaluate the manuals of heavy machinery.

Based on my search of recent research focusing on minimalism, it can be concluded that the situation has stayed largely the same: despite the interest in minimalism, little data about its practical applications is available. Therefore, in addition to aiming to gain information about the documentation quality of Samsung and Apple, my thesis intends to, for its part, fill in this research gap as a practical application of minimalism.

2.6 Heuristic evaluation

Heuristic evaluation is a method for identifying usability problems using established usability principles or *heuristics* and it is the most common informal method (Holzinger, 2005, p. 72). An example of established usability heuristics are the ones created by Molich and Nielsen (1990) who have determined nine usability heuristics: Simple and natural dialogue, Speak the user's language, Minimize the user's memory load, Be consistent, Provide feedback, Provide clearly marked exits, Provide shortcuts, Provide good error messages and Error prevention. Though these usability heuristics may be the best known, many users of the method have developed their own heuristics as well (Nielsen, 1994, p. 152).

According to Nielsen (1995), heuristic evaluation should preferably be conducted by a group of 3-5 people, with each individual evaluator doing the first inspection alone. During this process the evaluators use a list of recognized usability heuristics to inspect the different elements of the interface. Only after completing the individual evaluations, the evaluators are allowed to communicate with each other and aggregate their findings. Individual evaluation is an important part of the process because it helps each evaluator provide independent and unbiased evaluations. Nielsen (1995) mentions that in addition to the general heuristics chosen for the evaluations, the evaluators can freely consider any additional usability principles that

may be relevant or even develop category-specific heuristics that can be applied to a specific class of products. The evaluators themselves can decide how they want to proceed with the evaluation, though Nielsen (1995) generally recommends that they go through at least two rounds of evaluation.

Compared to other evaluation methods, heuristic evaluation has a few significant advantages. It is often used, because it is a relatively inexpensive method, and it can be used early in the design process (Nielsen and Molich, 1990). Heuristic evaluation allows to discover a majority, even over 75%, of the total usability problems with only a few evaluators, while user tests, for example, may require a high number of end users (Lecaros, Paz & Moquillaza, 2021). However, it can be difficult for a single person to do, which is why Nielsen and Molich (1990) recommend that heuristic evaluation is done involving 3-5 evaluators. They have determined this to be the optimal number of evaluators, because having more than 5 people does not necessarily mean that much additional discoveries are made.

There are disadvantages to heuristic evaluation as well. A systematic literature review conducted by Lecaros, Paz and Moquillaza (2021) revealed that the most noticeable problems encountered with this method are low suitability of the chosen heuristics, the low expertise and number of evaluators and the lack of formalization in the process of heuristic evaluation. In addition, Holzinger (2005, p. 72-73) states that the disadvantages of heuristic evaluation include the possible separation from the end users and the evaluators may sometimes pay too much attention to one section over another, meaning that the complete design is not necessarily evaluated.

While heuristic evaluation has perhaps typically been used in the field of usability, it has been utilized in other fields as well. In technical communication, heuristic evaluation has been used in the evaluation of both printed and digital documentation and online help applications (Virtaluoto, Suojanen & Isohella 2021, p. 31) and different sets of heuristics have been developed for different purposes. The minimalism heuristics discussed in the previous sections are an example of heuristics that can be

used in technical communication, but heuristics have also been developed, for example, specifically for the development of accessible online text production (Mäkipää & Isohella, 2022) and even for user-centered translation (Suojanen, Koskinen & Tuominen, 2015).

3 PRESENT STUDY

3.1 Aims and Research Questions

The aim of this thesis is to analyze and compare two different user manuals from the perspective of minimalism and to gain knowledge about the documentation quality of two global companies, Samsung and Apple. By conducting a heuristic evaluation, the usability and overall quality of the documentation is assessed. Since the quality of documentation should always be defined from the perspective of the end users, minimalism as an approach that places the user into the center was chosen to be the main framework of this study. The research questions are the following:

1. How are the manuals following the principles of minimalism?
2. What differences and similarities does the evaluation reveal?

To answer the first question, the contents of the manuals are described and assessed using the minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021) as guidelines. The aim of the evaluation is to reveal any possible problems in the manuals. When it comes to the second question, I focused on comparing the results of the evaluation to find out if certain parts of one manual had more problems than the other or if there are significant similarities.

3.2 Data and Methods

The data for this thesis was collected from two different smartwatch user manuals from Samsung and Apple. As with many technological devices, there are many different models of smartwatches from various competing manufacturers on the market today. This posed a challenge for the collection of data, since from the options it was not easy to determine which ones would perhaps be the best suited for the purposes of this study. However, I wanted to focus on well-known global brands and choose the manuals for recent or newest models of smartwatches in their selection. The manuals that I have chosen are for Samsung Galaxy Watch 6 / Galaxy Watch 6 Classic and Apple Watch with watchOS 10 which is the newest operating system for the Apple Watch. The manuals are available online as PDFs and the links to them are provided in the list of references.

The manuals are combined 541 pages long, but for the purposes of this study, only certain parts were chosen. To make the comparison of the results easier, I chose the parts of the manuals that focus on similar tasks and functions. A brief analysis of the overall contents of the manuals revealed that while they had a plenty of similarities, they varied the most when moving on from the most basic functions, such as how to set up the watch and get started. For that reason, I chose to focus on the parts of the manuals that have instructions about the basic functions. Therefore, the sections chosen for the data are the “Getting started” -section from the Samsung manual and “Introducing the Apple Watch” and “Set up and get started” -sections from the Apple manual. The data consists of 36 pages from the Samsung manual and 36 pages from the Apple manual, making total number of pages 72.

As mentioned previously, the heuristics chosen for the evaluation are the minimalism heuristics by Virtaluoto, Suojanen & Isohella (2021). During the evaluation, I first evaluated the two manuals separately, using the individual heuristics as guidelines to assess the quality of the manuals. As Nielsen (1995) mentions, there are no strict rules as to how to conduct a heuristics evaluation, and it is up to the evaluator to decide

how to proceed. I decided to start evaluating each manual by first browsing through them, without actively utilizing the heuristics yet at this point. The aim was to make note of things that somehow drew my attention. After this, I went over the manuals systematically focusing on answering the individual heuristics. After first evaluating the manuals separately, I then proceeded to compare the results with the aim to find the main differences and similarities between the manuals.

I used all the heuristics in the list as they are shown in Table 1 to the extent that they could be used. There were certain things that had to be considered when doing the evaluation that stemmed from the chosen data and the scope of this evaluation. While most of the heuristics were easily applied to the data in question, heuristics 1.5 and 1.6 were beyond the scope of this evaluation, and I was not able to apply them directly to the data in question. This is explained further in the section 4.1. Another aspect that had to be considered during the evaluation has to do with the error information of the manuals and especially with the way errors are understood in this context. Van der Meij and Carroll (1995) distinguish three different types of errors, which are semantic errors, syntactic errors and slips, and they are all related to the users' actions during the completion of tasks. My understanding of errors in this context is, therefore, that they are mistakes that the users might make during the completion of different tasks that then may prevent or hinder the completion of said tasks. Because the data chosen for this evaluation is focused on very simple, basic tasks, it influences what types of errors the users may face and how much error information is necessary.

4 ANALYSIS

In this chapter the results of the heuristic evaluation and the comparison of the results between the two manuals are presented. The analysis is structured based on the categories of the minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021), and the subheadings correspond to the names of the different categories. Therefore, this chapter begins by first focusing on the core tasks and goal-orientation of the manuals, followed by the analysis of the accessibility. Lastly, the error management of the manuals is focused on.

4.1 Core tasks and goal-orientation

In this first part of the analysis the focus is on the users' core tasks and the goal orientation of the documentation. The heuristics mainly used in this part are from 1.1 to 1.4 and heuristics 1.5 and 1.6 are shortly summarized at the end. To start, it is important to note that since my data consists of the parts of the manuals that are focused on the very basic functions of the watches and how to get started with using one, this is reflected in the types of tasks that are included in my chosen data. The tasks are very simple, and the goal overall is for the user to learn to use the different functions of the watch.

Both manuals start with a few pages that introduce the watch to readers. In the Samsung manual this includes a short overview on page 7 that summarizes the main functions of the watch and a chapter that has information and visualizations about the technical details as well as additional things the user should take note of. The Apple manual, similarly, starts with a brief introduction to the watch, which is followed by images of each different watch model that use the watchOS 10.2, which the manual applies to. After that, on pages 14 to 21 there are short introductions to the central features, such as how to get started with the watch as well as how to use the watch to track important health information. Both manuals include instructions about how to set up the watch when the user first gets started with one, pairing the watch with a phone, charging the watch and checking the charging status and how to turn the watch on and off and how to fasten or change the band. In addition, the Apple manual has a separate section that instructs the user how to change the language and orientation of the watch and the Samsung manual has chapters that are focused on how to control the screen, use the actual watch -function, notifications and how to enter text using the keyboard.

There is a significant difference between the manuals when looking at the amount of general or additional information about the watches. The Apple manual tends to have a minimal amount of additional information written out and instead it often guides users to another part of the manual or other online guides for more detailed information. The focus is clearly on the core tasks of the user and all the chapters apart from the “Introducing Apple Watch”-chapter (p. 7-21), which has introductory information about the device and its functions, have step-by step instructions included. The Samsung manual, on the other hand, has a lot of general information included and written out, in addition to instructions to the user about how to do certain tasks and use the different functions. Despite this, the manual does still overall focus on the user’s core tasks well. Like the Apple manual, it has numbered step-by-step instructions in almost every chapter. The exceptions to this are the first two chapters that have some basic information about the watch, or the “Quick panel”

chapter and the “Entering text” chapter, though these still have instructional content about how to use a certain function of the watch.

As mentioned earlier, since the parts that were chosen for this evaluation are focused on the basic functions, which is, of course, reflected on the types of tasks that the instructions focus on. To evaluate how the documentation reflects the real-life structure of each task, I focused on the way the step-by-step instructions in the manuals are done. Overall, in both manuals the step-by-step instructions reflect the simple nature of the tasks, as the instructions themselves are straightforward and simple, with clear, easy to understand steps. Good examples to illustrate this are the instructions about how to connect the watch to a phone in both manuals. In the Apple Watch manual, this chapter begins by first telling the user what they need to do to prepare, followed by the instructions, which are divided into four steps and each of these steps are further divided if needed. For example, the first step begins by putting on the watch, then turning the watch on and so on, with each individual action separated into its own short step. Additional advice is only included in the steps where it is necessary or where the user may have issues. Similarly, in the Samsung manual the instructions about how to connect the watch to a phone are short, straightforward and they clearly tell the user how to proceed. Here additional advice is also included in the steps where it is relevant, with more information included only after the steps. Therefore, I would say that the instructions in both the Samsung and the Apple manual reflect the real-life structure of each task very well.

However, there is little focus on explaining why a task is done in addition to how. This may be explained with the simplicity of the tasks as well since the reasons behind each task can be quite self-explanatory. The user does not need explicit explanation about why, for example, the battery of the watch needs to be charged for them to be able to use it or how to check the charging status. Still, among the text there are occasions where short explanations are offered with one or two sentences. In the Apple manual, for example, the instructions about how to pair the watch with an iPhone start with explaining that “To use your Apple Watch, you need to pair it with

your iPhone” (p.30), which clearly tells the user that the watch cannot be used without completing this task. A similar example can be found on page 40, in which regarding the fact that refreshing apps in the background may use power, it is stated that “To maximize battery life, you can turn this option off”. Examples of this kind can be found in the Samsung manual as well. On page 17 the user is told to “Turn on power saving mode to extend the battery’s usage time” and then on page 23, it is explained that “To connect your Watch to a phone, install the Galaxy Wearable app on the phone”.

In most sections in both manuals, there is a minimal amount of introductory information included before the step-by-step instructions. In the Apple manual, there is often just a short introductory sentence before the steps, or the steps start immediately after the heading. A good example of this can be found on page 33 where there are instructions about how to set up more than one Apple Watch and how to pair your watch with a new iPhone. Each smaller section that has step-by-step instructions starts with one or two introductory sentences, such as the one shown in Figure 1. On page 35 about how to set up the charger, there is no introductory sentence, and the step are immediately after the heading (see Figure 2).

Figure 1: Step-by-step instructions of pairing the Apple Watch with a new iPhone

Pair Apple Watch with a new iPhone

If your Apple Watch is paired with your old iPhone and you now want to pair it with your new iPhone, follow these steps:

1. Use iCloud Backup to back up the iPhone currently paired with your Apple Watch (see the [iPhone User Guide](#) for more information).
2. Set up your new iPhone. On the Apps & Data screen, choose to restore from an iCloud backup, then select the latest backup.
3. Continue iPhone setup and, when prompted, choose to use your Apple Watch with your new iPhone.

When iPhone setup completes, your Apple Watch prompts you to pair it with the new iPhone. Tap OK on your Apple Watch, then enter its passcode.

For more information, see the Apple Support article [How to pair your Apple Watch with a new iPhone](#).

Figure 2: Step-by-step instructions about how to set up the charger in the Apple manual.

Set up the charger

1. In a well-ventilated area, place your charger or charging cable on a flat surface.

Your Apple Watch comes with the Apple Watch Magnetic Fast Charger to USB-C Cable (Apple Watch Series 7, Apple Watch Series 8, and Apple Watch Series 9 only) or the Apple Watch Magnetic Charging Cable (other models). You can also use a MagSafe Duo Charger or Apple Watch Magnetic Charging Dock (sold separately).
2. Plug the charging cable into the power adapter (sold separately).
3. Plug the adapter into a power outlet.

There are exceptions as well, where there is more text included before the steps. For example, on page 30, under the “Set up and pair your Apple watch with iPhone” heading, there is a warning as well as introductory information that states what the user needs and what they must do before they can begin taking the steps. As the information is directly related to doing the task at hand successfully, and it is written in a concise manner, it can be seen as necessary. Another example can be found on

page 38 of the manual, where before the steps of how to save power by turning on Low Power Mode, there is general introductory information about the function, as well as an image of the watch screen when the Low Power Mode is turned on.

Like the Apple manual, there is typically a minimal amount of text, if any, placed before step-by-step instructions in the Samsung manual as well. Exceptions, however, can be found as well. For example, on page 14, under the “charging the battery using wireless power sharing” heading there is a longer piece of text informing the user that the watch can be charged with the battery of a device that works as a wireless charging pad and it includes details about what might affect the effectiveness of charging. A similar example is on pages 17 and 18, where before the actual instructions about how to attach the band to the watch, there is an introductory section, which states that the band should be attached before using the watch and it also includes a warning about being careful when attaching or replacing the band, as well a mention of the possible variations of the band depending on the region or model. Overall, though, both manuals do provide users with the opportunity to start working on real-life tasks immediately.

Answering the last two heuristics of the core tasks and goal-orientation section (*1.5 Is the documentation available when needed?* and *1.6 Does the user get targeted instructions at the relevant touch points on the user journey?*) is beyond the scope of this evaluation, since the focus is only on certain parts of the manuals, and I have no information about the documentation processes that took place when the manuals were produced. Therefore, it is difficult to make judgements about the availability of the documentation and the user journey. This evaluation is focused on the instructions that are relevant at the very beginning of the user journey and based on this data it is difficult to make judgements regarding the rest of the user journey. However, since both manuals are freely available on the brands’ websites and the users can search the manuals online if they encounter a problem with the watch, for the purposes of this thesis, it can be assumed that the documentation is available when needed.

4.2 Accessibility

4.2.1 Content

In this part of the analysis the focus is on the overall accessibility of the documentation and the evaluation is focused on the content and its structure to assess the findability, the understandability of the language and the visual elements used in the documentation. The heuristics that were used in this part of the evaluation are from 2.1 to 2.5. The evaluation revealed significant differences between the manuals and while the Apple manual does not seem to have any major issues, the Samsung manual seems to have issues particularly regarding the structure and relevance of the content.

As mentioned in the previous chapter, there is a significant difference between the manuals in terms of the general information included in the manuals. The Apple manual is very concise in its overall contents as there seems to be little to no unnecessary information included in the sections chosen for this evaluation. The evaluation revealed, however, that with the Samsung manual, there are noticeable issues with the content. There are parts of the manual where entire pages consist only of text, often in a bulleted list and organized very densely with from beginning to end. These pages typically have additional information about the watch or error information, such as warnings to not do something. There are several good examples of this, such as pages 11, 15, 16 and 21. This is a significant difference between the manuals, since in the Apple manual even the pages that do only consist of textual content, the information is divided into their own sections with headings and a significant amount of the text is step-by-step instructions.

In terms of the content and its conciseness, there were issues in the Samsung manual that did not appear in the Apple manual. Firstly, there were instances where the same information was included in more than one place, even within the same section. For example, on page 11, which includes warnings as a bulleted list, the second point warns to keep the watch away from things such as credit cards, implanted medical

devices and other objects that can be affected by magnets. The same warning is repeated in the fourth point in different words. Another example can be found on pages 15 and 16, in the “Battery charging tip and precautions” -section. It starts with a warning about only using a Samsung approved charger and cable that are designed for the watch, since using an incompatible charger can cause injuries or damage to the device. A similar warning is mentioned almost immediately after, as the second point of the following list and again on the next page. The three versions seem to differ in terms of severity based on the use of warning signs: the first and second instances are used with red and orange symbols with exclamation marks, while the third instance is used with a green symbol. In addition, imperative verb forms are used in the first two instances, while in the third instance it is only “recommended to use an approved charger that guarantees the charging performance” (p. 16).

Secondly, there are occasions in the Samsung manual where certain sections could perhaps be completely removed. Examples of such occasions can be found on page 19: the page includes a section with instructions of how to put on the watch, from placing the watch around your wrist to closing the buckle and adjusting it if necessary. I think it is questionable whether users need detailed instructions about how to put the watch on their wrist, as it does not seem unreasonable to expect the users to know this from prior experience. The Apple manual does have similar instructions on page 48, but rather than focusing only on instructing the user how to put the watch on, and adjusting the band if it is too tight, it is rather explained that fastening the band correctly is important so that the sensors in the watch work properly. To summarize, overall, the contents of the Samsung manual are not as concise as they could be.

4.2.2 Structure and understandability

The evaluation revealed that there are no major issues regarding the overall structure of the content in either manual. In the Apple manual, the information within each section as well as the way the different chapters are ordered is logical: the steps that need to be completed first are placed at the beginning and things that are related to

each other are placed in the same chapters. For example, the section instructing the user how to charge the watch also tells how to check the charging status, save power and optimize the battery charging and use. Similarly, on page 44, the user is given instructions about how to lock or unlock the watch, but also how to change or turn off the passcode and how to proceed if they have forgotten the passcode. In the Apple manual, the headings are also clear, and they help guide the users to instructions they are looking for.

The overall contents of the Samsung manual are also structured logically, especially on the level of different chapters, and like the Apple manual, the headings are clear and intuitive. However, analyzing the different sections and their contents in the Samsung manual further revealed that there are instances where the accessibility of the documentation is decreased because of the structure of the content. A good example is the “Charging the battery” section on pages 13-17. This section starts with very clear step-by-step instructions on how to charge the battery by using wireless charging, but the part about how to check the charging status (p. 14) could be moved to the end, after the “Charging the battery using Wireless power sharing” section. Since the two ways to charge the battery are similar, it can be assumed that you can check the charging status of the watch the same way in both cases. Therefore, it would make more sense for it to be at the end instead of only part of the “Wireless charging” section. In addition, the “Wireless charger” section, which only includes a visualization of the charger and a warning to not expose the charger to water, could be moved into the “Charging the battery” chapter, since it is an essential part of charging.

In addition, there are occasions in the Samsung manual where the content within certain sections seems disorganized and difficult to read. This is the case for example on page 34, where additional information indicated by a green symbol is placed in the middle of step-by-step instructions, as a part of the 5th step. This causes there to be a large section of text organized by bullet points in the middle, while the rest of the steps are written in a concise manner. The effect of this is disruptive and it would perhaps

be more suited to be at the end after all the steps. In addition, similar instances can be found, for example, on page 12 and page 29. A table summarizing the functions of each button of the watch on page 12 would be better immediately after the images earlier in the chapter, since the layout of the device and the buttons are shown in them. On page 29, where there are instructions about how to turn the screen on and off, the different methods to turn on the screen are listed as bullet points and the font is bolded to make them stand out from the rest of the text. The text, however, looks very dense and challenging to read. Perhaps a better way to organize the information would be to put it in the form of a table, with the methods on one side and the instructions on the other.

When it comes to the understandability of the documentation, the large amounts of text in the Samsung manual are a factor that makes the information somewhat difficult to understand in some places. This is the case, for example, on pages 11, 15, 16 and 21: they only have extra information and warnings and perhaps the users are not very likely to read these sections at all. When it comes to the tasks and step-by-step instructions, however, they are generally easy to follow and understand and longer tasks are broken into shorter sequences. Overall, the steps are very clear, with simple language and short sentences, and they focus on instructing the user how to complete the tasks. The same is true with the Apple manual.

4.2.3 Visual elements

Visual elements are utilized in both manuals. The Samsung manual has images of the watch itself to convey information about the technical details, but also to instruct the user about how to use a certain function or how to do a task, such as the image on page 14 that illustrates how to place the watch on top of the device that works as the wireless charging pad. The manual includes both simplified, black and white drawings of the outlines of the watch, as well as colored, “life-like” images of what the watch and the screen look like. The images are sometimes used, when the aim is to highlight the differences there might be between Watch6 and Watch6 Classic, which




are the two versions of the watch this manual applies to. A good example of this is on pages 7 to 10, which have illustrations of the watches, as well as on page 26, which illustrates the different types of bezels the two version of the watch have.

Like the Samsung manual, the Apple manual also uses images to convey technical information and as a part of instructions to help the user understand what to do. The images are most often colored images of the watch's screen, but there are also a few images of a phone screen. Examples of this can be found on pages 14, 17 32, 34, 46. These images are mostly used to illustrate how to use the Apple Watch app on the user's phone. In the Apple manual most of the images are colored, life-like images and there are no drawings that have only the outlines. However, on pages 36 to 37, there are black and white visualizations of the way the charger is placed to each of the different watch models. Therefore, like in the Samsung manual, images are sometimes used to illustrate the differences between the models that the manual applies to.

Based on the evaluation, the images included in both manuals seem to be relevant. The images are very clear and informative throughout the manuals and illustrate how to use the different functions of the watches. Overall, they connect well to the text as they are placed next to the relevant information or instructions. However, one occasion in the Samsung manual where a part of the visual elements could have been left out did catch my attention while doing the evaluation. In the "Device layout and functions" chapter, pages 7 to 10 have visualizations of the watch (for both Watch6 and Watch6 Classic), which have the most important details indicated and named. This section includes four images of both models that show the watch from different angles: first a real-life image and then a simplified outline from the same angle. Having both the colored real-life image and the outline of the watch is perhaps not necessary. The colored picture has fewer things pointed out, but those same things are included and can be easily seen in the image of the outline below, among the other more technical aspects, such as light sensor, NFC antenna, microphone. Therefore, it is perhaps not necessary to have both types of pictures included, since the colored image does not necessarily add more value. However, this is a very minor issue.

In addition to these images, different symbols and icons are used throughout the manuals. They are used among the text as part of instructions to help the users with the different functions as well as to indicate warnings or additional information. In the Samsung manual, there are three different symbols used: a red triangle with an exclamation mark, an orange circle with an exclamation mark and a green square with a pen (see Table 2). The red and the orange symbol are used next to error information and different warnings, and they are discussed in more detail in the next section. The green symbol seems to be indicating additional information that may be necessary to mention but is not crucial enough to warrant one of the warning signs. This ranges from things that might affect the use of the watch and advice not to do something that may cause the watch to malfunction or not work at an optimal level to informing the user about things that may be different depending on the model.

Table 3. Symbols used in the Samsung Watch6 manual.

Symbol	Function
	Warning sign used with the most crucial information and warnings.
	Warning sign used to indicate error information and warnings that are less crucial, but still important.
	Used to indicate additional information that may be necessary to mention but does not need one of the warning signs.

The use of the green symbol in particular seems to be quite inconsistent, and I could not determine a clear pattern of what kind of instances it is used in. It is often used next to very long pieces of text at the end of a chapter and sometimes next to a short introductory sentence before instructions or in the middle of step-by-step instructions to point out a relevant piece of information. Sometimes it is used together with the other warning symbols to organize the information from most to least important.

There are also occasions, where it is not used in a place that perhaps could have had it. For example, on pages 15 and 16 in the “Battery charging tips and precautions” section, where warnings and additional information are placed, the green symbol is used together with the other two symbols. A similar section, “Band tips and precautions”, is included on page 19, and while the information is organized with bullet points, like the previous one, it does not have the green symbol next to it.

While the Apple manual utilizes different symbols as well, they are used much more sparingly than in the Samsung manual. There is only one example of a warning sign being used in the pages of the manual that were chosen for this evaluation, which can be seen in Figure 3. However, there is another similar warning on page 37, which does not have the same symbol. This warning is easily overlooked, and it would be easier for the user to notice it, had the warning sign been there. The Apple manual does not have a similar symbol to indicate additional information, like the Samsung manual. However, a small image of a lightbulb is used with tips and advice to help the user (see Figure 4). A benefit that the Apple manual has regarding these symbols is that it is clearly stated in writing after them what their functions are. While the warning sign may be self-explanatory, the lightbulb would perhaps not be so easily understood without the word “tip” used next to it. Compared to the Samsung manual, in which the symbols are used on their own with no written explanations, this is a significant advantage. Especially the green symbol and what it means and what kind of information it is supposed to indicate is perhaps not immediately clear to the user in the Samsung manual.

Figure 3. Example of the use of a warning symbol in the Apple Watch manual.

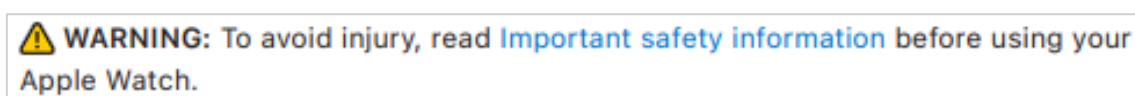
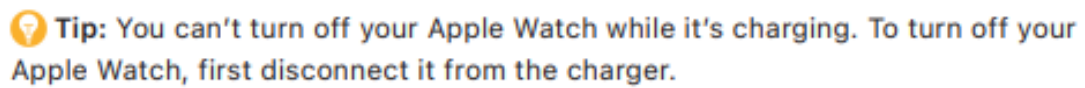


Figure 4. Example of a lightbulb symbol used in the Apple Watch manual.



4.3 Error management

In this chapter, the focus is on the way errors are taken into consideration in the manuals and the evaluation focuses on heuristics from 3.1 to 3.7. As mentioned in previous sections, there is a significant difference in terms of the amount of content in the manuals, since the Samsung manual has included considerably more general and additional information, while in the Apple manual the reader is often directed to other parts of the manual for additional information. This is true with the amount of error information and warnings included in the manuals as well. In fact, the pages from the Apple manual chosen for this evaluation only include two examples of a warning being used on pages 30 and 37, as was mentioned in the previous section. Both warnings direct the user to the “Important safety information” section in the manual. There is also no error information placed next to the instructive content in the manual. With this I mean preventing errors and mistakes that the users might make during the different tasks. One possible example of this is on page 32 under the heading “Trouble pairing”, which offers solutions for the users who may have encountered issues with setting up and pairing their Apple Watch with their iPhone. On the other hand, even these are not really errors that the users might make, but rather additional tips on what to do if they encounter problems and as was stated in section 3.2 “error” is understood in this thesis as mistakes that the users might make during the completion of different tasks that then may prevent or hinder the completion of said tasks.

The Samsung manual has more error information and warnings, though I would still say that actual mistakes that users might make during the tasks are not really taken

into consideration either. The manual does have a lot of warnings included which are typically used with either a red triangle with an exclamation mark or an orange circle with an exclamation mark, as discussed in section 4.2.3. They can be found in almost every chapter of the manual that was evaluated, while the Apple manual only had the two warnings. The red symbol is typically used with health and safety related warnings or actions that might significantly affect the functionality of the watch. The orange symbol, on the other hand, is typically used to indicate information about things that might lessen the functionality of the watch or cause it to malfunction, as well as some health-related information, though the warnings are perhaps meant to be less severe. Since the symbols seem to be used with similar information that varies in terms of severity, I do not know if both are necessary. The difference between the information they are used with is perhaps not different enough and using only one of them with only the most crucial warnings would catch the attention of the user better.

The warnings in the Samsung manual are used in various places as well. It is typical that they are at the end of each chapter and the symbols are often used together in a descending order of importance. This is the case especially with longer sequences of warnings where the red symbol is used first to indicate that the information next to it is the most important and then below the orange symbol is used. While the warnings are typically placed at the end of each section, especially if there are various things to take note of, there are also a lot of shorter warnings included among the instructions and other relevant places, next to relevant procedures. In two chapters the error information and warnings are placed under their own headings. These sections are the "Battery charging tips and precautions" on pages 15 to 16 and the "Band tips and precautions" -section on page 19. In the first one, all three symbols are used, which is perhaps not necessary, since the heading already tells the user, what kind of content the section has. All in all, the necessity of the warnings included in the Samsung manual can be questioned and perhaps including fewer warnings would make it easier for the users to take note of them properly.

5 DISCUSSION AND CONCLUSION

In this thesis I aimed to gain knowledge about the documentation quality of two global companies through a heuristic evaluation, using the minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021) as guidelines. The two main objectives of the evaluation were to describe the ways in which the manuals follow the principles of minimalism and then compare the results to determine the differences and similarities between the manuals. The evaluation revealed interesting details and while as a broad conclusion it can be said that both manuals have elements that adhere to the principles of minimalism, issues were discovered especially in the Samsung manual. Based on the evaluation, minimalism is more visible in the Apple manual.

Perhaps the most noticeable difference between the two manuals was the amount of content included in them. The Apple manual is much more concise in terms of the overall content, while the Samsung manual has a notable amount of additional information included. There are occasions where the text could have easily been reduced by removing parts where information is repeated or certain sections that perhaps were not necessary. Overall, though, both manuals do primarily focus on the users' core tasks and the way the step-by-step instructions are structured ensures that the users have a chance to start working on the tasks immediately.

When comparing the results, the quality of the Apple manual seemed to be better in terms of accessibility. The amount of content included in the Samsung manual is a

factor that occasionally negatively impacts the accessibility, especially in the parts where whole pages are densely packed with text from beginning to end. In addition, instances where information is unnecessarily repeated or a section that could be completely removed were found in the Samsung manual and not in the Apple manual. The overall structure of the manuals is good, though in the Samsung manual certain smaller sections could work better if they were structured differently. Visual elements are used in the manuals both to convey technical information as well as to support the user when completing tasks. Overall, the use of visual elements is good in both, though the use of the symbols in the Samsung manual is somewhat inconsistent.

Evaluation of the error management highlighted the differences between the amount of content in the manuals even further. Only two warnings were found in the Apple manual while the Samsung manual has warnings used in almost every chapter. However, there is little focus on actual mistakes that the user might make while doing the tasks. This might be explained by the simple nature of the tasks since the parts of the manuals that were evaluated only focused on the very basic functions of the watches. Major mistakes may not be very likely to occur while completing these particular tasks.

There are certain considerations to be mindful of when it comes to the analysis and results that stem from the chosen method of evaluation. While one of the advantages of heuristic evaluation is that it allows to discover the majority, over 75%, of the total usability problems involving only 3-5 usability experts, certain problems have been identified as well (Lecaros, Paz & Moquillaza, 2021). The most noticeable problems with this method are the low suitability of the chosen heuristics, the low expertise and number of evaluators and the lack of formalization in the process of heuristic evaluation (Lecaros, Paz & Moquillaza, 2021). As this evaluation was only done by one person, perhaps the most important issue is the possible subjectivity of the results.

Additionally, Holzinger (2005, p. 73) has pointed out that one of the disadvantages of heuristic evaluation is that it does not necessarily evaluate the complete design. This is relevant to my study since I am only looking at the manual without the watch. The focus of this study is only on the finished manual and therefore there is a certain separation from the actual use of the product and how the manual would be used to support it. In addition, I cannot make assumptions about the documentation processes of these companies. While the main framework of this study is minimalism and the heuristic evaluation was conducted using the minimalism heuristics by Virtaluoto, Suojanen and Isohella (2021), I cannot assume that minimalism has been the approach in the documentation processes.

It is also important to note that the results cannot be generalized. The aim of the study was to examine and evaluate the documentation of two global companies and the results cannot be used to make assumptions about the documentation of other similar products from different companies. However, while I only evaluate part of the manuals, I assume that the issues found in the parts evaluated are present also in the rest of the manuals.

Even though choosing heuristic evaluation as the method for this study means that there are certain issues with the results that need to be mindful of, it also offers opportunities for further studies. For example, the analysis could be extended and tested by having other evaluators conduct the evaluation for the same data that I used in this thesis. In addition, other parts of the manuals could also be evaluated using the minimalism heuristics to determine if the same issues found in the current data are, in fact, present in the rest of the manuals as well. Lastly, because a large part of the motivation behind this study was the importance of documentation quality both to the companies and to the users, there is a possibility for further testing by conducting a follow up study where actual end users are involved, for example, by interviewing them. Based on only my evaluation, assumptions cannot be made about what the users think of the documentation or how their perceptions about the products or brands may be affected.

As was established in chapter 2.1, the importance of providing users with good quality documentation is recognized and documentation quality can impact how the company and its products are viewed by the users. This study demonstrated, though, that the quality of the manuals between different companies can have noticeable differences in terms of their quality, particularly when evaluated from a minimalist perspective. The results of this study can possibly be used to improve the quality of the manuals when they are updated or if new manuals are written, to ensure that the user is taken into consideration. Furthermore, this study can be utilized as an example of how the quality of user manuals can be evaluated to find out the most prominent issues with manuals and other types of documentation. The same evaluation that was conducted here can quite easily be replicated to uncover problems with other smart watch manuals and other similar products.

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