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Norway's ICT Accessibility Legislation, Methods and Indicators

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Abstract. This paper gives an overview of the Norwegian legislation on Universal Design of information and communication technology (ICT) and how the Norwegian Authority for Universal Design of ICT works to enforce and achieve the goals behind the legislation. The Authority uses indicators to check websites for compliance with the regulations. This paper describes the rationale and intended use for the indicators and how they are used for both supervision and benchmarks as well as a way of gathering data to give an overview of the current state of Universal Design of websites in Norway.

Keywords. Universal Design, accessibility, legislation, ICT, supervisory authority, indicators, WCAG 2.0

1. Introduction

The Norwegian Government has a vision of a society where everyone can participate. Digitization is a means to improve public services and make everyday life easier for citizens. In the Norwegian Digital Agenda [1] the government has stated that accessibility and Universal Design is considered a prerequisite for successful digitization.

This paper gives an overview over the law making processes and policies regarding Universal Design in Norway that led to the legislation of Universal Design of ICT. Both websites, mobile applications and self-service machines are to be universally designed in accordance with the regulations. This paper mainly concerns the Universal Design of websites, which must comply with 35 of the 61 success criteria in the Web Content Accessibility Guidelines (WCAG) 2.0.

The Norwegian Authority for Universal Design of ICT is an inspectorate responsible for supervising and administrating the regulations and uses an array of instruments and actions authorized by the legislation. The Authority is a part of the Agency for Public Management and eGovernment (Difi) in Norway.

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2. Norwegian Accessibility Legislation and Policies

The aim of the legislation is an inclusive society with accessible ICT for as many citizens as possible. The Norwegian legislation uses the term "Universal Design" unlike many other countries that primarily uses the term "accessibility" or "inclusion". By adopting requirements that set a minimum standard for what a universally designed ICT solution is, Universal Design becomes a strategy to reach the aim of an inclusive society also in the digital world.

This measure must however be seen together with the anti-discrimination legislation as a whole, which includes both the individual right to each person not to be discriminated against and the right to individual assistance where necessary.

Universal Design of ICT also features in the Norwegian government's action plan for Universal Design [2].

2.1. Norwegian Universal Design Legislation

In 2001, the Norwegian government started to think about implementing Universal Design as a legal term and to use Universal Design as a strategy [3]. In 2008 the Norwegian parliament adopted the anti-discrimination and accessibility act, which ensured the Universal Design for all areas of society, also for ICT solutions. The purpose of the act is to promote equality regardless of disability. Equality means equal status, equal opportunities and rights, accessibility and accommodation. The Act shall help to dismantle disabling barriers created by society and to prevent new ones from being created [4].

The act also defines what is meant by Universal Design: *"By universal design is meant the design or the adaption of the main solution in the physical world, including information and communication technology (ICT), in such a way that it can be used by as many as possible."*

The regulations apply to the main solutions that companies and businesses make available to the public. By main solution, the law means the primary way a company communicates or offers their services to the public. A company may offer several main solutions. In the case of a bank, this could for instance be a website, an ATM, a mobile application or over the counter services.

The law applies to all businesses in both the public and private sector. It also applies to clubs and organisations, such as charities or foundations. However, the law does not apply to schools, universities and other learning institutions in the education sector. A proposal to change the law to include the education sector has been put forward by the Norwegian government and may be adopted in the autumn of 2016 [5].

2.2. Universal Design of ICT Legislation

On July 1 2013 the regulation on requirements for Universal Design of ICT was adopted [6]. This was an important milestone for ICT accessibility in Norway.

The legal definition of ICT is broad on purpose, and aims to be technology neutral: *"By information and communication technology (ICT) we mean technology and technology systems that are used to express, create, convert, exchange, store, duplicate or publish information, or in some other way make information usable."*

By ICT solutions, the regulations specify two kinds of ICT:

- Web solutions, such as websites and mobile applications.
- Self-service machines, such as vending machines, ticket machines, ATMs and payment terminals.

This paper does not elaborate on the regulation of self-service machines, but focuses on the regulation of websites, which is a form of web solution.

Web solution refers to any solution delivered over the internet and is defined as follows: *"Web solution: Dissemination of information or service that is available in a browser or equivalent, accessible via a URI (Uniform Resource Identifier) and that utilizes the HTTP protocol (Hypertext Transfer Protocol) or equivalent to make content available."*

The rationale behind this broad definition of was to have a future proof definition to make sure that new online solutions and new technologies would be universally designed. For instance, mobile applications began appearing after the law was written and adopted, but because of this broad definition, mobile applications that need an internet connection in order to operate, are also included in the scope of the regulations.

2.3. Deadlines and Saftety Valves

The legislation operates with two deadlines for when websites must comply with the regulations.

- 1 July 2014: All new websites are subject to the law. When the contract for design and development of the website is signed after July 1 2014, the website is considered new ICT. However, many changes and updates to the website over time may accumulate and lead to the website being considered new ICT.
- 1. January 2021: The regulations apply to all ICT solutions - both new and existing websites. Websites that do not undergo substantial changes in design and programming before 2021 are considered existing ICT until January 1 2021, when all websites must comply.

This transitional period is included in the law to ensure that the requirements do not impose unduly cost to the businesses, as the cost of changing an existing website to meet the requirements are thought to be substantially higher than including Universal Design in the plan, design and development from the beginning of the project.

One of the original objections towards making the regulations apply to the private sector was that it was deemed too expensive. Hence, the regulations allow the Authority to grant exemptions from the deadline as a safety valve. This was to ensure that if it were too expensive to meet the requirements with existing technology, the company would be given a longer time frame to meet the criteria. However, it is interesting to note that as of summer 2016 only one case so far has been put forward to the Authority and thus the demand for exemptions has been very low indeed.

2.4. The ICT Requirements

The regulations state the minimum requirements for Universal Design of ICT.

For self-service machines ten international standards were chosen [7]. The standards cover areas such as user interface, keypad layout and location and surroundings.

The law requires web solutions to meet the requirements in the Web Content Accessibility Guidelines (WCAG) 2.0 [8] at levels A and AA. However, three WCAG success criteria regarding time-based media are exempt from the regulations. These are the success criterions 1.2.3 Media alternative, 1.2.4 Captions (live) and 1.2.5 Audio Description. At the time the regulations were passed, it was considered too expensive for website owners to meet these three requirements. A total of 35 WCAG 2.0 success criteria are part of the regulations.

3. Difi's Role as a Supervisory Authority

The legislation states Difi as the supervisory authority responsible for enforcing the regulations. When the regulations on Universal Design of ICT was adopted July 1 2013, Difi established of the Norwegian Authority for Universal Design of ICT (the Authority).

3.1. Priorities and Target Areas

The Authority's work is based on a white paper to the Norwegian parliament regarding public sector inspectorates and supervision. In the broadest sense of the word, the term "supervision" is understood as a generic term for any activity or use of instruments and actions to follow through on the intentions set forth by regulations [9].

In addition, the Authority operates in the intersection between politics and different diciplines, such as Universal Design, technology, statistics, and law. The Authority also needs to balance user needs and interests of the industry.

As specified in the Authority's supervision strategy [10], the Authority aims to achieve this through performing supervisory activities and inspections, area surveillance and providing guidance. The Authority also keeps up to date on developments in the fields of technology and standardisation to make sure that the requirements are up to date.

The Authority's supervision strategy prioritizes so-called risk-based inspections. In order to perform supervisory activities that are efficient, effective and promote digital accessibility, it is important for the Authority to target the inspections at areas where lack of compliance is of great consequence for the end users.

Focus is held on areas of society with low compliance of the regulations, entities with large user groups and services that are essential for equal participation.

For web solutions, the Authority's priority sectors and industries are public sector services, finance and banking, transport and travel and media and communication.

For self-service machines, the Authority's priority sectors and industries are healthcare, finance and banking, transport and travel and retail.

3.2. Area Surveillance

As the Authority puts great emphasis on a risk-based approach, resources and focus is invested in area surveillance.

Through benchmarks and surveys, the Authority develops statistics, collects findings and uses analyses to get valuable insight into which areas are high in non-compliance, which digital barriers end users experience, and how different users groups experience different usability and accessibility problems.

An important part of the area surveillance is to hold dialog meetings with user organisations, business organizations and the ICT industry.

The area surveillance forms a base for other activities such as risk-based inspections and the guidance work, and gives important information on which areas of society to target with information or control activities.

3.3. Supervisory Activities and Inspections

The Authority monitors for compliance with the requirements. An inspection is directed towards a single website or self-service machine and involves contact with the company that owns the ICT solution.

The overview of an inspection of a targeted website is as follows [11]:

1. **Inspection notice:** A notice is sent to the company that is responsible for the website. The company is asked to submit any relevant documentation regarding the development and daily operations of the website.
2. **Preliminary meeting:** The Authority meets with the company to explain the reasons for the inspection and presents which parts of the website that are subject to tests.
3. **Testing:** The Authority tests a selection of pages from the website, using a set of indicators. The most common user tasks are tested.
4. **Assessment:** The documentation and test results are assessed to check for compliance.
5. **Possible results:** There are three possible results from an inspection – compliance, deviations and notices. Compliance means that the inspection uncovered no errors on the parts of the website that were tested. Deviations mean that the website does not comply with the regulations, while notices mean that the Authority discovered areas of improvement that are not considered offenses.
6. **Final meeting:** The Authority meets with the company to present the results.
7. **Inspection report:** The inspection findings are summarised in a report and is sent to the company for feedback. Final reports are published online [12].
8. **Follow-ups:** If a website is found to be non-compliant, the company is asked to submit a correction plan.
9. **Corrective actions:** If a correction plan is not submitted or the corrections are not made, the Authority can demand corrective actions or issue fines.

In the case of corretive actions, the Authority sets a deadline for the completion of the corrections. If the deadline is not met, the Authority will issue daily fines until corrections are completed. The law states that the fines shall be high enough to ensure that non-compliance will not "pay off". There is hence a penal element of the fines.

So far no fines have been issued, as all companies have submitted and followed though on their correction plans.

The Authority may also grant exemptions – that means to delay the time frame for compliance if it can be documented that meeting the requirements will be unduly costly with existing technology.

3.4. Guidance and Communication

As this is a new area of law with a broad scope, providing guidance is deemed crucial for making the legal requirements for Universal Design of ICT known.

Website owners, designers, developers, editors and content managers all need to see the value of Universal Design. A website may be launched fully compliant, but updates and posting of inaccessible content may render the site unusable to many users. Thus the work on Universal Design is an ever-ongoing job. Everyone who works on a website, whether it be developing, designing or publishing must work continuously to make the content accessible.

Only by conveying the purpose behind the legislation, one can achieve real inclusion. This is achieved through guidance and understanding of best practices.

Through the website uu.difi.no [13] the Authority provides guidance on how to understand the legal requirements and how to make ICT solutions universally designed in accordance with the law.

In addition the Authority also communicates through social media, conferences and direct dialogue with different interest groups.

3.5. An Overview of Methods

The role as a supervisory authority for Universal Design of ICT dictates which instruments and actions the Authority has at hand when it comes to testing ICT solutions and methods for selecting which businesses and companies to supervise.

The Authority is faced with the task of supervising the minimum requirements set forth by the regulations. Thus, the task is both authorized and limited by the legislation. To do this, the Authority needs methods to be able to verify whether websites comply with the success criteria in WCAG 2.0.

In addition, the Authority needs methods for identifying companies, businesses and ICT solutions that are relevant for inspections. In Norway there are almost 200 000 private sector and public sector entities, clubs and organisations that are obligated to follow the regulations [14].

The Authority needs a solid analytical foundation, with methods that provide good performance information. This both applies for single website inspections and benchmarks as a basis for risk-based supervision.

Through this analytical foundation the Authority can gather and discover information regarding many areas, for instance:

- What are the most important uses of websites among end users?
- Which industries reach the most users?
- Which industries have the greatest rate of digitization?
- Which industries have the most accessible ICT solutions?

- What are the biggest digital barriers experienced by the end users?

The legislation is new and Universal Design of websites is still a fairly new discipline in Norway. Thus the Authority has placed great emphasis on knowledge production in terms of developing methods for data production that support the needs of an inspectorate in this area of law and technology.

In the Authority's work on inspections and area surveillance, the most important methods are:

- Performing large-scale surveys to identify companies and businesses that are relevant for supervision.
- Performing inspections and testing websites for conformance with WCAG 2.0 using the Authority's indicators
- Performing benchmarks by testing a larger volume of websites for WCAG 2.0 conformance using the Authority's indicators. This enables the Authority to identify digital barriers and WCAG 2.0 violations at an aggregate level, specified by types of web content, industries and user requirements.
- Identifying areas at risk by summarising the data gathered from inspections, benchmarks and surveys. This gives the Authority an overview of the status of Universal Design in Norway and is a way to direct efforts and supervision.

4. The Authority's WCAG 2.0 Indicators

The most comprehensive method used by the Authority is the indicators developed from the WCAG 2.0 success criteria and supporting documents.

The word «indicator» comes from the verb «to indicate», which means «to show» or «to point out». A common definition is «an observable phenomenon that shows the condition relating to another, not directly observable phenomenon [15].

There is no simple and effective method that allows us to assess in what degree a single website, or a larger set of websites conform to WCAG 2.0. Thus, the Authority needs indicators that give an indication of, or show the extent of Universal Design of websites as the term is defined in the regulations.

The Authority has taken an interdisciplinary and analytical approach to developing indicators, with contributions from the areas of law, technology and statistics.

4.1. The Indicators Represent the Authority's Interpretation of the Regulations

In accordance with the regulations, each WCAG 2.0 success criterion is to be understood as a regulatory requirement. An important part of developing the indicators have been reading WCAG 2.0 as a legal document.

It is important to understand that these are minimum requirements that makes most websites more accessible, but still leaves aspects of inclusion unsolved. Compliance with WCAG 2.0 does not guarantee in itself a website that is accessible to everyone [16].

By using WCAG 2.0 and the WCAG supporting documents, such as Understanding WCAG 2.0 [17], Techniques for WCAG 2.0 [18], the How to meet

articles [19] and the WCAG 2.0 glossary [7], the Authority has operationalised the requirements to make it possible to check for compliance.

The WCAG 2.0 success criteria are written as testable statements that are not technology-specific. The World Wide Web Consortium (W3C) provides guidance about how to meet the success criteria in various technologies, as well as general information about interpreting the success criteria. The Authority has made it a priority to create indicators to test the most widespread web technologies, such as HTML, CSS and WAI-ARIA.

The WCAG documentation describes a great variety of ways of developing accessible web content. In some cases, the Authority has made constraints and clarifications when interpreting the requirements. In case of conflicting sources, the success criteria, i.e. the regulatory requirement, takes precedence. These assessments are all documented for future reference, in order to make the Authority's interpretations known.

4.2. Operationalising WCAG 2.0 into Indicators

The Authority's methods for checking websites are mainly comprised of manual expert evaluations. In 2016, the Authority is also looking into automated testing. Automated testing would be a supplement and not a full alternative to manual testing. The goal is to use automated tools to screen a single website or large sets of websites, completely or partly. The Authority is also looking into different tools to screen for types of web content, which may reduce the time it takes to perform a test and allows for partial automation of the testing process.

This will enable the Authority to look for possible at-risk areas, which can later be tested using the WCAG 2.0 indicators in either inspections or benchmarks.

The indicators do not involve user testing. User testing is often crucial for evaluating usability, especially when websites are user tested with an array of disabled users.

The reason for performing expert evaluations and not including user testing as a part of the indicators is mandated by the Authority's role as an inspection Authority. The Authority's task is to perform inspections to check whether websites comply with the minimum WCAG 2.0 requirements described by the regulations. An overall assessment of the test results based on every single requirement is the reasoning for any corrective actions or consequences of violating the regulations.

Every WCAG 2.0 success criterion is operationalised into one or more indicator. The complexity of each success criterion determines how many indicators are necessary to measure compliance. The test procedures include a detailed description to ensure standardized verification. Regardless of the tester, the procedure is written to produce the same result every time.

In the same way, the procedures for registration of test results are standardised. Hence, the test generates data that form a basis for assessing compliance.

As an example, WCAG 2.0 requires contrast levels of at least 4,5:1 for normal text and 3:1 for large scale text [7]. The test procedure is designed to lead the tester through a systematic procedure and to gather all relevant data. The answers to each step determine how many steps the tester must complete. The summary of the indicator for measuring contrast is as follows:

1. The tester measures and records the contrast between the text and its background for the defined test object.
2. If the contrast exceeds 4.5:1, the test can be ended because the regulatory requirement is met.
3. If the contrast is between 3:1 and 4.5:1, the tester is asked to measure font size.
4. If font size is regarded as large-scale text, the object meets the requirement and test can be ended.
5. If font size is smaller, or the contrast less than 3:1, the tester tests for a high contrast alternative.
6. If such an alternative is present, the tester assesses the mechanism to activate high contrast, the contrast level of high contrast and the content found in high contrast.

The aim is to generate test data of good quality, meeting the needs both for assessments in inspections and to provide reliable data for analysis and area surveillance. An additional aim has been to document the procedures and results in such a way that others can test them and still produce the same results, and that the test results can be refuted.

Indicators provide information on both a detailed and an aggregated level. For instance, one indicator provides information about keyboard navigation in forms, while another provides information about error messages in forms. This approach enables the Authority to add the results from all indicators relating to forms and provides information on which extent the form design of the website is in compliance.

Furthermore, the Authority will be able to summarise the test results for a large volume of websites, and using the same set of indicators, extract more aggregated information about barriers in digital forms. The data generated through inspections of can thus be aggregated to give information on digital barriers for Norwegian websites as a whole.

4.3. Quantification of Test Results

When the indicators are used to inspect individual websites, qualitative test results are primarily of interest. It will however be of interest to quantify, for example, how many images the websites contain, and the share that lacks a satisfactory text alternative. A qualitative and discretionary assessment of test results will always be the basis for the conclusion of supervisory inspections.

When the indicators are used for benchmarking and area surveillance, there is a need to extract quantitative results, for instance measured by compliance and non-compliance. If necessary, the results may also be grouped in terms of a scale showing either conformance or different degrees of deviation.

The aim is to establish a reliable way to quantify the test results, for example by using a scale, which makes the data well suited for both aggregated measurements, such as "State of the Nation" for digital barriers and benchmarking. In benchmarking, the Authority compares results across industry groups, types of content, different parts of WCAG 2.0 or by different user preconditions.

In essence, for various purposes and on different levels, the Authority uses all or some of the indicators to assess the Universal Design of websites.

4.4. Findings from Indicator Use

In 2014, the Authority tested websites and collected data through a benchmarking initiative [20]. The results show that businesses in all tested industries have issues when it comes to accessibility on their websites. We found the websites of municipalities and government agencies to be the most accessible.

The banking sector appears to have the least accessible websites, closely followed by the media and communication sector. Banking services and media related websites are the most frequently used websites in Norway.

The survey uncovered the most digital barriers related to HTML markup, closely followed by text alternatives for images, contrast between text and its background and other issues related to navigation. Digital forms and other process-oriented and interactive content are considered potential risk areas, because they significantly influence the opportunities for equal participation.

5. In conclusion

With the introduction of the anti-discrimination and accessibility act in 2008 and regulations on Universal Design of ICT in 2013, Norway has established minimum legal requirements for Universal Design of websites. The Authority's WCAG 2.0 indicators provide a method for testing and assessing WCAG conformance, as well as a way of gathering data for area surveillance. Results from the Authority's area surveillance shows that there is room for improvement when it comes to Universal Design of websites in Norway

In addition, having legislation with such a broad and ambitious scope has put Universal Design of ICT on the agenda for managers in all businesses. Vendors experience getting the same contract demands from both the private and public sector. This has caused a shift in the Norwegian market. Earlier, only accessibility experts offered services on Universal Design, but now every big vendor offers WCAG-compliant solutions as a part of their standard services.

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