E-vote 2011
Accessibility and Usability Requirements

MINISTRY OF LOCAL GOVERNMENT
AND REGIONAL DEVELOPMENT

Case no:
Version: 1.1
Date: 05.05.09

E-vote 2011

Accessibility and Usability Requirements:

Project: E-vote 2011

NORWEGIAN MINISTRY OF LOCAL GOVERNMENT
AND REGIONAL DEVELOPMENT

The E-vote 2011-project

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1.   Introduction

In its discussion of the 2008 National Budget, the Storting has given its endorsement of e-voting trials at the 2011 municipal elections.

A project has been initiated under the direction of The Department of Local Government (KOMM) of The Ministry of Local Government and Regional Development (KRD). In 2006 a working committee initiated by KRD delivered a report on e-voting entitled "Electronic voting – challenges and opportunities". The report will provide the foundations of the project, but its conclusions will not represent absolute framework conditions.

It is a fundamental democratic right that everyone has equal opportunity to participate fully in society and working life. Nevertheless, people with disabilities often experience society as full of barriers that result in differential treatment. This is the background to the Norwegian Discrimination and Accessibility Act, which came into force on the 1st of January 2009.The Act stipulates requirements concerning universal design of environments and has supplementary requirements for accessibility at workplaces, schools and day care centers. The Act also contains provisions on general protection against discrimination.

Everyone who works for the central government, local government or other public sector organizations has a special duty to counteract discrimination of persons with disabilities and should lead the way by setting a good example. In order to meet the project goals and fulfill the Council of Europe Recommendation Rec(2004)11 and the New Law Jan 2009: The Prohibition of Discriminatory Treatment of the Physically Disabled Act
   –   New IT services aimed at the general public shall adhere to the principles of universal design from July 1. 2011.

This purpose of this document is to be as specific as possible with regards to:

- Requirements to support accessibility and universal design
- Requirements to support good usability

The supplier shall ensure that all requirements are implemented and tested. The requirements shall apply to the entirety of the system. Methods and process for supporting a good user experience, accessibility and usability throughout the entire development process shall also be documented by the supplier.

- The supplier shall indicate in a separate spreadsheet (Attachment 'Requirements table') for each requirement whether it is covered in the proposal or not
- Suppliers shall detail all requirements flagged as 'Y' in the column 'Elaborate'

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2.   Prototype Requirements

Prototypes of the suppliers' solutions shall be made available on the internet as part of the suppliers answer to sendout 5.
Prototypes must be available in Norwegian to be evaluated. The prototypes provided by the suppliers for sendout 5 will be evaluated and tested (with regard to accessibility and usability) by the following criteria:

- Adherence to functional requirements for the e-voting use case
- Adherence to the WCAG 2.0 AA-level success criteria. When JavaScript is used in a particular prototype, the supplier should in any case document how the scripts maintain a web page's accessibility and WCAG conformance, as this cannot be tested with the automatic testing tools available as of today.
- Level of cross-platform independence (OS and browsers)
- Adherence to the ELMER 2 standard
- Adherence to other accessibility and usability requirements in chapter 5 in the "Acessibility and usability requiremtents"
- Results from usability testing with users with physical and cognitive disabilities, and elderly users
- Results from heuristic evaluation of usability by usability experts. The experts will be using various checklists to evaluate the prototypes, including Nielsen's usability heuristics, Bruce Tognazzini's First principles, and Difi's quality criteria for Norwegian official web sites (http://kvalitet.difi.no)

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3. Usability Requirements – ELMER 2

ELMER (Easier and more Efficient Reporting), is a comprehensive set of principles and specifications for the design of Internet-based forms. The Norwegian Ministry of Trade and Industry has decided that the most recent version, ELMER2, shall be the common guidelines for user interfaces in Norwegian public forms for enterprises on the Internet. All public governmental forms in Norway shall be based on the ELMER guidelines within the end of 2008.

All public forms in the system shall be designed according to ELMER 2 standards. ELMER 2 requirements are listed in this chapter .The ELMER 2 document in English can be found here: http://www.brreg.no/elmer/elmer2-english.pdf. The (EL) notation in the far left column means that the requirement ID is the original ELMER 2 requirement ID.
The solution for the e-voting client shall follow the ELMER 2 standard.
We believe the ELMER standard gives sound advice for achieving good usability in general and could be applied to other parts of the solution as well.
Suppliers may deviate from the ELMER 2 standard if their planned solution is conflicting with accessibility or security requirements. In these instances, the supplier must document why they deviate and specify the section(s) of the ELMER 2 standard where they deviate.

3.1 The navigation area (From components of the page)

A separate navigation menu shall help the form filler orient himself about the main topics of the form, show where he is, and enable him to move between the different form pages. Carefully considered and standardized use of navigation elements shall ensure easy recognition between forms from different inquirers.

No.	Requirements
(EL) 1.1.1	All ordinary form pages must contain a navigation area on the left side of the screen.
(EL) 1.1.2	The navigation area must contain a title for each of the pages of a form. For forms containing track options, only the regular pages shall be shown until a track has been selected.
(EL) 1.1.3	The page titles in the navigation area must provide an easy-to-understand description of the topic(s) on the page, using as few words as possible. The most important information in the title should be presented first in the text. All page titles within a form must be different from one another. In cases where it is possible to differentiate between different menu options by using easy-to-understand names, numerical codes (numbers used to identify different posts) must be avoided or be placed last.
(EL) 1.1.4	Each individual page title must be linked to a form page, and allow the form filler to choose the order in which he or she would like to complete, or read, the relevant pages. The representation of the active page must be highlighted.
(EL) 1.1.4a	The page order in forms must be locked where: 1) the order is significant with regard to response interpretation and quality, or

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No.	Requirements
	2) the order will depend on responses given on previous pages.
(EL) 1.1.5	Standardized text, in the navigation area above the first page reference, must indicate whether the completion order can be random or is locked.
(EL) 1.1.6	In forms with many pages (normally more than 7 - 8 pages), titles for different groups of pages (group titles) should be added above the pointers to the individual pages, or as a super ordinate level in an expanding menu. Collective terms used for the subordinate pages must be easy to understand for the relevant user group. The group titles must be highlighted.

3.2 The Information Area (From components of the page)

A separate area must be set aside for providing the user with optional additional information in addition to the information given by questions, labels, and messages relating to completion-related errors or ambiguities. User-requested help makes it possible to provide new, desired knowledge to unskilled users without having to overburden the professional user with unwanted information. Carefully considered and standardized use of information elements shall ensure recognition and familiarity between forms issued by different inquirers.

No.	Requirements
(EL) 1.2.1	All ordinary form pages must contain an information area on the right side of the screen.
(EL) 1.2.2	In the information area, the user will be presented with a user-requested help and feedback on how to correct errors (error messages and warnings). The text must be presented in its entirety, i.e. not as a tool tip, hint or in another way which require specific positioning of the mouse pointer.
(EL) 1.2.3	User-requested help must appear when the user clicks on a standardized help icon in connection with a question. The user can make the help text disappear from the screen by clicking again on the same symbol, and must be replaced by a different text if the user clicks on the icon connected to a different question.
(EL) 1.2.4	Error messages and warnings must appear in the information area if the corresponding field is clicked upon on a separate validation page.
(EL) 1.2.5	Both the help texts or error messages/warnings and the input field must be visible within one screen. The start of the information should appear automatically on the same line as the question it relates to.

3.3 Other elements (From components of the page)

In the world of paper, the actual interaction between the inquirer and the form filler is supported by guidance material and a support apparatus. These functions must also be safeguarded in the electronic forms, above and beyond the use of help texts, and in a way that is easily recognizable

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from form to form. Also navigation between different form pages, saving, validation and the actual submission process must have a common, well thought through methodology.

No.	Requirements
(EL) 1.3.1	The labels, input fields, help symbols and inline help used in the form must be presented in a separate input area between the navigation area and the information area.
(EL) 1.3.2	At the top right hand corner of every ordinary form page, there must be a link entitled "Help". This link must open up a separate page (help page) with access to relevant information about the following topics: • **About completion and use** Brief information stating that a help symbol next to the input fields provides a more detailed explanation, that the system stores data continuously, and that nothing is being submitted before you explicitly tell the system to do so on the last page. • **About sub-forms and enclosures** On how the different forms are interconnected with one another, and the possible need to transfer data and figures between different forms; on how and where to find and download sub-forms, and on how to add an attachment. • **Contact information** About contact person and the relevant authority, telephone number, email address etc for further assistance for both technical and subject-related guidance. • **About the form** General guidance and information about the form which cannot naturally be linked to one specific input field or field group. Including reply deadlines, declarant target group, and in what situations the form is to be used. In addition, legal basis for collecting the information, information about the right of appeal, about penal provisions and about eventual re-use of information. The information may be presented directly in the form or in separate sub-pages, depending on how extensive and detailed the information is. The help page does not have to have a standard page layout.

3.4 Track options and response-dependent questions (From structure and order)

The various questions presented in a form have a varying degree of relevance to different user groups. Helping large user groups to avoid questions that are not relevant to their situation, is perhaps the most important simplification measure which can be achieved by introducing electronic forms. But this requires extensive knowledge as to which fields are relevant to which user.

No.	Requirements
(EL) 2.1.1	In forms where a significant number of questions are irrelevant for specific form filler groups, or where different form filler groups shall complete significantly different sets of questions, different tracks must be developed. Each individual user shall be directed to the relevant track. Several tracks may consist of identical pages/question sequences.

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No.	Requirements
(EL) 2.1.2	Questions that fall within the scope of a track but still only applies to a small percentage of the declarants (response dependent questions) should be made inaccessible to users which they do not concern. A long sequence of rarely relevant questions should rather be established as a separate track.
(EL) 2.1.3	Both labels and input fields for response dependent questions must be grayed on the form pages and only be opened for completion if previous answers indicate that they are relevant.
(EL) 2.1.4	In cases where it is necessary for the purpose of selecting the correct track or response dependent question, an additional filtering question may be added. This shall only be done in cases where the collective simplification for the users is greater than the additional work generated by adding the filtering question.
(EL) 2.1.5	Questions which determine track options or response-dependent questions should be presented directly before the relevant track option or response dependent question, unless this conflicts with the logical composition or general division of topics.

3.5 Paging and page order (From structure and order)

When the scope and order of form pages is adjusted to fit the medium and the form filler's situation, it may increase the form filler's understanding of the task at hand, the navigation between different pages, and give him or her a better understanding of how the different parts of the form completion are interlinked.

No.	Requirements
(EL) 2.2.1	Questions which concern one and the same logical topic should be presented on one page, even if this means that the user will have to scroll vertically. For extensive topics, one should attempt to create logical subcategories and present them on separate pages. A reasonable number of pages is more important than keeping the pages short. *It is important to mention that users using screen magnification software will have difficulties with scrolling (From the Norwegian association of the Blind and Partially Sighted).*
(EL) 2.2.2	Fields/questions (if any) relating to personal identification (the number, name and address of the declarant, form filler or inquirer should all appear on the initial form page. Other questions should be avoided on this page. This page must be entitled "Introduction."
(EL) 2.2.3	When questions presented on different pages are closely related, they should be presented in an order that correspond to the form filler's natural chain of thought, normally moving from premises/ingredients to conclusions/summaries.
(EL) 2.2.4	If the form will present a summary of completed data across different pages, this summary must be presented on a separate page at the end. This page must be entitled "Summary", and the Summary page must indicate clearly that the form has not yet been submitted.

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No.	Requirements
(EL) 2.2.5	Personal identification information about the declarant must be repeated in the form of text, (not input fields) on the Summary Page.
(EL) 2.2.6	Each individual page should be delimited with a view to avoid an unreasonably long download time. The download time is affected by such factors as graphics use, the amount and type of controls and the number of fields.

3.6 Page structure (From structure and order)

If the structure and order of questions are adjusted to fit the web medium and the form filler's situation, it may serve to increase overview and understanding of the separate components of the task. This may require great deviation from any paper version of the form.

No.	Requirements
(EL) 2.3.1	All form pages must have a heading (page title) which clearly describes what is being dealt with on the relevant page. In cases where the page title is not identical to the short title given in the navigation area, the short title must appear in parentheses after the full title.
(EL) 2.3.2	The order in which the fields appear on a page must follow a natural logic, from the first to the last (e.g. from last year's figures to this year's, from January to December), and from the various components to the end result (e.g. from price per item to total expenses).
(EL) 2.3.3	The order in which all the elements appear on a form page must follow the natural direction for reading from left to right and from the top downwards.
(EL) 2.3.4	The elements linked to one and the same field must be presented in the following order : < field number (If any)>, <label>, <help symbol>, <signs (if any)>, < input field>, <descriptive term, format, limit value etc>. On the next line <reference or other instant explanation (inline help text)>
(EL) 2.3.5	In cases where a form contains three or more fields which logically belong together (field category), these fields must be grouped together on the same page and be given a descriptive name. This also applies to additions and subtractions as well as calculations. The category must be marked with outline borders, and all fields belonging to the same group must be kept inside these borders. If the page contains only one category, borders shall not be used.
(EL) 2.3.5a	As an alternative to outline borders, and in order to indicate a weaker connection, additional space between the rows can be used.
(EL) 2.3.6	In cases where a field group will not be visible within one single screen, one should if possible attempt to create logical sub-groups and present them separately.
(EL) 2.3.7	Horizontal scrolling shall not be required. Page elements should be placed vertically, above each other rather than side by side, if necessary to ensure that this requirement is adhered to.

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(EL) 2.3.8	The choices available for checkboxes, radio buttons and drop down lists must use a wording that is meaningful for the user.
(EL) 2.3.9	Values used in lists must be sorted in an order that is meaningful for the form filler. If the alternatives are unfamiliar to relevant users, and the order cannot be predicted logically, long multiple choice lists should be divided, and single choice lists should be presented in two steps.

3.7 Identification labels (From Form elements)

The label constitutes the primary description or definition of the data to enter in each individual field. In addition, an identifying name or number, as well as the label, may serve as a reference in the communication with the user with regard to the relevant field, topic or form. It is a challenge to find short and concise definitions that are meaningful, and easy to grasp, and to use concepts which the user can be expected to understand, still managing to convey the complete meaning of the content.

No.	Requirements
(EL) 3.1.1	Forms with long complex titles should be given an additional easy-to-understand short title, similar to the short title given to laws. The short version of the form title should appear in parentheses after the formal, full title in the form's title field, so that it can be used as a search concept.
(EL) 3.1.2	Field numbers (often used to identify different posts) are only to be included in the label when they are important for guidance or communication purposes in relation to the field, and must be avoided in cases where they are not required.
(EL) 3.1.3	For electronic forms that are also published in a paper version, the label assigned to a given field must be identical for both versions, provided the field itself shall have the exactly the same meaning in both versions.
(EL) 3.1.4	In cases where it is important to the form filler's understanding of a particular field, the denomination such as percent (%), limit values such as the maximum deduction permitted, and/or formats, such as date formats, should be described in connection with the actual field and not in user-requested help.

3.8 Tables (From Form elements)

Many forms contain extensive information sets which have to be entered into a table. Traditionally, this involves particular pedagogical and layout-related challenges with regard to electronic forms as well as for their counterparts on paper.

No.	Requirements
(EL) 3.2.1	If a similar set of data shall be submitted for an unknown and varying number of units, the form should present a dynamic table where new rows can be added if needed.

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No.	Requirements
(EL) 3.2.2	If necessary to avoid vertical scrolling, an existing table must be divided into several tables in the web form. The individual parts must be divided logically and be given different easy-to-understand headings.
(EL) 3.2.2a	When utilizing the full page width is essential to avoid horizontal scrolling, particularly extensive tables must be presented on a separate page (table page) without the standard page layout. The pages shall be designed to work with a minimum resolution of 800x600.
(EL) 3.2.3	In tables where labels appear above cells (column headings), vertical scrolling resulting in labels disappearing from the screen when filling in the bottom fields, should be avoided.

3.9 Figure processing in forms (From Form elements)

Many questions used in forms are meant to serve as an educational tool, guiding the form filler toward the correct answer to complicated calculations based on more familiar figures. A uniform notation and processing of figures will increase the form filler's understanding of an area that is of critical importance to data quality.

No.	Requirements
(EL) 3.3.1	A field which receives value(s) automatically from (an) other field(s) that are not visible on the screen at the same time as the receiving field, must be equipped with user requested help explaining where the figure came from. The field or fields from which the figures are being transferred should also be equipped with similar user-requested help explaining the transfer.
(EL) 3.3.2	Manual transfer of text, or manual copying or summations of figures from one field to another in the same form, or to a different form, should be avoided. In cases where the form filler still has to manually transfer a value from one field to another, this operation must be explained in inline help, present at the receiving field as well as the sending field.
(EL) 3.3.3	As long as it does not conflict with logic and topic division in general, figures that are part of summations and calculations should be kept on a single page to reduce the need for calculations and transfer of values across pages.
(EL) 3.3.4	When a summation has to stretch across several pages, interim sums should appear at the bottom of each page.
(EL) 3.3.5	If there are several interim sums which are not simultaneously visible to the user, a separate summations group should be created at the bottom of the page. If the interim sums are located on different pages, they should be transferred to a summary page.
(EL) 3.3.6	In forms with calculations stretching across several pages whose end result is important to the declarant, the results should be added to a summary page.
(EL) 3.3.7	In cases where it may be particularly unclear as to where a calculated figure originates from, the calculation formula or basis should be described in inline help. Less important formulas may be included as user-requested help.

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3.10 Conventions and symbol use (From Form elements)

In time, many experienced users have become familiar with various standard symbols and descriptions on the Internet. Sticking to the conventions will ease the user's understanding of the functionality and usage of the web form.

No.	Requirements
(EL) 3.4.1	For fields equipped with user-requested help, a clickable symbol, leading to the relevant help text, must be provided. The symbol must be placed directly in front of the relevant input field. Help symbols for groups must be placed directly after the label for the category.
(EL) 3.4.2	The help symbol must alter appearance when activated (clicked on).
(EL) 3.4.3	Checkboxes must be used where the user is permitted to select more than one out of multiple predefined answers (multiple choice questions), while drop down list or radio buttons must be used where only one answer is permitted (single choice questions).
(EL) 3.4.4	For public forms, pre-selected values should not be provided for checkboxes or radio buttons. In cases where the user is permitted to give an empty answer, "Don't know" or "No reply" (e.g.) shall be a valid and selectable option.
(EL) 3.4.5	Where it may serve to improve the form filler's understanding of the task, checkboxes, radio buttons and drop down lists should be used instead of open input fields.
(EL) 3.4.6	To save place, drop down list should be preferred to radio buttons when presenting a large number of mutually exclusive response alternatives. For tables, radio buttons are not an option.
(EL) 3.4.7	For dates, the format dd.mm.yyyy must be used.
(EL) 3.4.8	The following should be the standard order for elements that can receive focus with the help of the tab key on the keyboard: Help symbol (if any) for the first input field ->the input field (or first value from the top of the options list)-> forward button to the next form page (or the next natural option)->other elements on the page (if any). Grayed fields are skipped in the tab sequence. *It is important that as many shortcut keys are defined as possible, for example in terms of search, storing data etc, as long as the shortcut keys are well known (de facto standards). This will improve the user experience especially for people with visual impairments (From the Norwegian association of the Blind and Partially Sighted).*
(EL) 3.4.9	Fonts, font sizes, colors and other graphic elements, must be used consistently and uniformly in all forms issued by the same inquirer. The forms must differentiate clearly between various types of elements (headings, category headings, labels, error messages and warnings, etc.). As a general rule, sans serif fonts should be used and colors should provide good contrast.
(EL) 3.4.10	The form must comply with current conventions relating to web accessibility for all, including WAI requirements and general W3C conventions.

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3.11 Prefilling (From Help and feedback messages)

Applied correctly, prefilled data can ease the workload for the form filler. But checking prefilled data can also be a time consuming task. And prefilled information which cannot be corrected in the same web form in which it appears, may be more confusing than helpful. Appropriate use of prefilled data requires some general rules of play.

No.	Requirements
(EL) 4.1.1	Information which the inquirer has access to internally or from other sources, should only be presented in the form if the presentation is relevant to the form filler.
(EL) 4.1.2	When it is necessary to check if registered information is (still) correct, this information should be prefilled in the form. The same applies to deduction rates and other constants which may be useful to the user.
(EL) 4.1.3	Prefilled information, for example from public registers, which the form filler can not alter, should appear as text, while editable prefilled values must be presented in a field.
(EL) 4.1.4	In cases where prefilled register data cannot be altered in the form, information on how to report changes elsewhere, must be provided in inline help.

3.12 Help texts (From Help and feedback messages)

In paper-based reporting, providing sufficient information to the unskilled user, without overburdening the expert with unnecessary details, has always been a problem. Correct use of optional (clickable) help texts, in conscious combination with information which all users are exposed to, is a good solution to this dilemma. Optional, clickable information elements at different stages of the completion process, ensure that the information comes at the right time, and only to those who need it.

No.	Requirements
(EL) 4.2.1	Help texts believed to be necessary to a large percentage of form fillers must be presented briefly in the input area as inline help. Where a more extensive textual presentation is required, this information must be supplemented with a more detailed userrequested help.
(EL) 4.2.2	All fields, which according to experience lead to inquiries from form fillers, must be equipped with explanatory user-requested help. Avoid help texts where it would not provide additional information of relevance to any user group.
(EL) 4.2.3	Explanations provided in user-requested help must be adapted to fit the needs of the least skilled form fillers who do not make use of professional advisers and do not complete their form through professional systems.
(EL) 4.2.4	One user-requested help text should not exceed the height of one single screen.
(EL) 4.2.5	In cases where it is necessary to provide a quite extensive presentation as userrequested help, it should be presented in two layers, so that a basic general description

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	points to a separate in-depth description. The in-depth description must be presented on a separate page (in-depth page) which does not have to follow the standard page layout.
(EL) 4.2.6	Where it may be useful to the users, the help texts should contain links to other fields, words or phrases found in the form. Links may also be provided to information of special interest, or information which may interest particular user groups, if the text specifies clearly what kind of information the link leads to, and who it concerns. Links to information that is irrelevant to the form completion should be avoided.
(EL) 4.2.7	Vital general information that is not related to individual fields or field groups, must be presented on a separate help page to the form in general.
(EL) 4.2.8	Considerable effort should be put into tailor-making text for web presentation. In general, the help texts must be shorter, more structured and divided into smaller segments than what would have been acceptable for guidance material produced on paper.
(EL) 4.2.9	The readability of help texts should be increased through use of typographic means. Except for very brief phrases, the texts should be broken into a series of easily readable chunks with highlighted headings and keywords.

3.13 Error messages and warnings (From Help and feedback messages)

In web forms it is possible to give feedback on errors and mistakes before submission. This saves time and effort for both the declarant and the inquirer. Where ever the form filler is halted by automatic validations, it is important to provide clear information on how to correct it.

No.	Requirements
(EL) 4.3.1	In cases of incorrect completion of individual fields, an error message must appear automatically as soon as possible after the error has occurred. The text must appear in the information area and the relevant field must be clearly marked. Messages presented in a separate window (dialogue boxes or pop-ups) must not be used.
(EL) 4.3.2	An overview of all cases where mandatory input fields have been left blank, and of errors detected by cross-validation, must appear in an all-inclusive error summary on a separate validation page prior to signing/submission. The list must also contain cases relating to incorrect completion which have not been corrected during completion.
(EL) 4.3.3	The error summary should also include warnings relating to unusual, but permitted values or combinations of values, such as improbable deviations (e.g. from the expected date, or known average values) or improbable combinations (e.g. turnover / number of employees, age / number of children). The error summary must indicate clearly which of the errors listed that are absolute errors and which are improbabilities.
(EL) 4.3.4	By clicking on an error in the error summary on the validation page, the user must be directed to the right place in the form, where the relevant field/fields must be clearly marked. And the complete error message and/or warning must appear in the information area.

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No.	Requirements
(EL) 4.3.5	Once the user has corrected the error or made other changes, the error summary must be updated the next time the validation page is presented.
(EL) 4.3.6	The purpose of an error message is to help the form filler. The error message shall not primarily tell what is done wrong, but must point out how to fill it in correctly. (Use "Enter a valid postal code", rather than "the postal code is invalid").
(EL) 4.3.7	The purpose of a warning is to make the form filler reconsider whether the field has been correctly filled in. The text used in the warning, or on the validation page, must specify clearly that the entered value/combinations will be accepted as valid without alterations.
(EL) 4.3.8	Error messages or warnings relating to a cross-validation must include a standard text explaining that the (possible) error may be found in any and all fields included in the validation. All of the relevant fields must be marked as containing errors/possible errors.
(EL) 4.3.9	An error message or warning must not exceed the height of one screen.

3.14 Concluding messages (From the form environment)

People are often more unsure about whether reports submitted electronically will reach the intended recipient than when they use regular mail. It is therefore important that the recipient returns a clear confirmation that the form has been received, and provide clear information with regard to the further activities – if any – that are expected between the parties.

No.	Requirements
(EL) 5.1.1	Following submission, a confirmation page must confirm that the form has been received. The confirmation page must identify the inquirer and provide identification information about the declarant. The confirmation page must also provide the user with a reference number to be used in further, future communication between the declarant/form filler and the inquirer.
(EL) 5.1.2	In forms with a summary page, the information on this page must be repeated on the confirmation page, to the extent it could be of value to the user.
(EL) 5.1.3	The confirmation page should state clearly that new errors may be discovered during the further processing.
(EL) 5.1.4	On the confirmation page, the user must have the opportunity to print the confirmation page, and to receive it by email.

3.14 Other external functions related to the form (From the form environment)

Electronic forms are to a varying degree supported by surrounding systems. They may be part of a dedicated form portal and interact closely with this, or they may be free-standing applications. Another difference is that some forms can be submitted openly on the web while others require

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specific login/ authentication mechanisms. For the user's sake, the access to relevant support functions that are not part of the actual form completion, should appear and behave as uniformly as possible, irrespective of these variations.

No.	Requirements
(EL) 5.2.1	In the best possible manner the inquirer must facilitate for that external websites, as well as their own websites, are able to deep link to each of the individual forms. I.e. that the link must lead directly to the form and not to a superordinate site or an intermediate page level. For sites with logins, users who have followed the form link must come directly to the relevant form after login.
(EL) 5.2.2	In the best possible manner, the inquirer must facilitate for that both external, as well as internal searches are able to locate all forms, including all parts of a form set, whether the search phrase include elements of the full title of the form, or its short title (if any).
(EL) 5.2.3	In the best possible manner, the inquirer must facilitate for that the text presented under About the Form is accessible from both external as well as internal form overviews and collections of links, before the actual form is selected.
(EL) 5.2.4	In forms with required login, the user (form filler) must at all times be informed that he/she is logged in, and have easy access to log out. The username or other identifying information must be presented in the top right hand corner of every page followed by a log-out button directly below.
(EL) 5.2.5	The user experience of forms and form environments, must be approximately the same for all browsers and operating systems that are more than marginally used in the market.
(EL) 5.2.6	It must be possible to print out the entire form or relevant parts of the form, i.e. all labels, response alternatives and entered replies (if any) both before, during, and after completion. In addition, the form must facilitate for separate printouts of the confirmation page, the validation page, help overview and in depth pages (if any).
(EL) 5.2.7	In cases where the form filler will have to select a value from a comprehensive code set, he/she must be given easy access to the alternatives through a built-in search function, or other suitable well constructed dialogue. The selected code should be entered automatically into the relevant field.
(EL) 5.2.8	Prior to submission of form sets, an overview must be presented, indicating which forms are included in the submission.
(EL) 5.2.9	All entered data in a form must be saved automatically as often as possible during completion.
(EL) 5.2.10	In order to ensure legal protection and traceability for the declarant, it must be possible to retrieve an authentic representation of all data entered, into the same form version that was used during completion of the form.

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4.   Accessibility Requirements (WCAG 2.0)

The supplier shall document (http://www.w3.org/TR/WCAG20/) that the solution meets the WCAG 2.0 guidelines to success criteria AA. The supplier shall also respond to requirements at AAA level. W3C HTML Validator (http://validator.w3.org/) and W3C CSS Validator (http://jigsaw.w3.org/css-validator/) can be used for obtaining automatic reports. The 'WG' notation in the far left column corresponds to the WCAG 2.0 guideline chapters. Additionally, ID's with four levels ("WG 1.1.1.1", "WG 1.1.1.2", etc.) are obtained from WebAIM's WCAG 2.0 Checklist. See http://www.webaim.org/standards/wcag/checklist for the full text.
The WebAIM checklist is included due to its more concrete advice. Still, notice that conformance to WCAG 2.0 success criteria will be based on official WCAG requirements (http://www.w3.org/WAI/WCAG20/quickref/).

ID	Requirement description
WG 1.1	**Text Alternatives: Provide text alternatives for any non-text content**
WG 1.1.1	**Non-text Content (Level A)**
WG 1.1.1.1	All images, form image buttons, and image map hot spots have appropriate, equivalent alternative text.
WG 1.1.1.2	Images that do not convey content, are decorative, or with content that is already conveyed in text are given null alt text (alt="") or implemented as CSS backgrounds. All linked images have descriptive alternative text.
WG 1.1.1.3	Equivalent alternatives to complex images are provided in context or on a separate (linked and/or referenced via longdesc) page.
WG 1.1.1.4	Form buttons have a descriptive value.
WG 1.1.1.5	Form inputs have associated text labels or, if labels cannot be used, a descriptive title attribute.
WG 1.1.1.6	Embedded multimedia is identified via accessible text.
WG 1.1.1.7	Frames are appropriately titled.
WG 1.2	**Time-based Media: Provide alternatives for time-based media**

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WG 1.2.1	*1.2.1 Prerecorded Audio-only and Video-only (Level A)*
WG 1.2.1.1	A descriptive text transcript (including all relevant visual and auditory clues and indicators) is provided for non-live, web-based audio (audio podcasts, MP3 files, etc.).
WG 1.2.1.2	A text or audio description is provided for non-live, web-based video-only (e.g., video that has no audio track).
WG 1.2.2	*Captions (Prerecorded) (Level A)*
WG 1.2.2.1	Synchronized captions are provided for non-live, web-based video (YouTube videos, etc.)
WG 1.2.3	Audio Description or Media Alternative (Prerecorded) (Level A)
WG 1.2.3.1	A descriptive text transcript OR audio description audio track is provided for non-live, web-based video
WG 1.2.4	*Captions (Live) (Level AA)*
WG 1.2.4.1	Synchronized captions are provided for all live multimedia that contains audio (audio-only broadcasts, web casts, video conferences, Flash animations, etc.)
WG 1.2.5	*Audio Description (Prerecorded) (Level AA)*
WG 1.2.5.1	Audio descriptions are provided for all video content NOTE: Only required if the video conveys content visually that is not available in the default audio track
WG 1.2.6	*Sign Language (Prerecorded) (Level AAA)*
WG 1.2.6.1	A sign language video is provided for all media content that contains audio.
WG 1.2.7	*Extended Audio Description (Prerecorded) (Level AAA)*
WG 1.2.7.1	When an audio description track cannot be added to video due to audio timing (e.g., no pauses in the audio), an alternative version of the video with pauses that allow audio descriptions is provided.
WG 1.2.8	*Media Alternative (Prerecorded) (Level AAA)*

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WG 1.2.8.1	A descriptive text transcript is provided for all pre-recorded media that has a video track.
WG 1.2.9	**Audio-only (Live) (Level AAA)**
WG 1.2.9.1	A descriptive text transcript (e.g., the script of the live audio) is provided for all live content that has audio
WG 1.3	**Adaptable: Create content that can be presented in different ways (for example simpler layout) without losing information or structure**
WG 1.3.1	**Info and Relationships (Level A)**
WG 1.3.1.1	Semantic markup is used to designate headings (<h1>), lists (, , and <dl>), emphasized or special text (<strong>, <code>, <abbr>, <blockquote>, for example), etc. Semantic markup is used appropriately.
WG 1.3.1.2	Tables are used to markup tabular data. Headings, where necessary, are used to associate data cells with headers. Data table captions and summaries are used where appropriate.
WG 1.3.1.3	Text labels are associated with form input elements. Related form elements are grouped with fieldset/legend
WG 1.3.2	**Meaningful Sequence (Level A)**
WG 1.3.2.1	The reading and navigation order (determined by code order) is logical and intuitive.
WG 1.3.3	**Sensory Characteristics (Level A)**
WG 1.3.3.1	Instructions do not rely upon shape, size, or visual location (e.g., "Click the square icon to continue" or "Instructions are in the right-hand column").
WG 1.3.3.2	Instructions do not rely upon sound (e.g., "A beeping sound indicates you may continue.").
WG 1.4	**Distinguishable: Make it easier for users to see and hear content including separating foreground from background**
WG 1.4.1	**Use of Color (Level A)**

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WG 1.4.1.1	Color is not used as the sole method of conveying content or distinguishing visual elements.
WG 1.4.1.2	Links are distinguishable from surrounding text. If color alone is used to distinguish links, an additional differentiation (e.g., it becomes underlined) is provided when it receives focus.
WG 1.4.2	*Audio Control (Level A)*
WG 1.4.2.1	A mechanism is provided to stop, pause, mute, or adjust volume for audio that automatically plays on a page for more than 3 seconds.
WG 1.4.3	*Contrast (Minimum) (Level AA)*
WG 1.4.3.1	Text and images of text have a contrast ratio of at least 4.5:1.
WG 1.4.3.2	Large text (over 18 point or 14 point bold) has a contrast ratio of at least 3:1
WG 1.4.4	*Resize text (Level AA)*
WG 1.4.4.1	The page is readable and functional when the text size is doubled.
WG 1.4.5	*Images of Text (Level AA)*
WG 1.4.5.1	If the same visual presentation can be made using text alone, an image is not used to present that text.
WG 1.4.6	*Contrast (Enhanced) (Level AAA)*
WG 1.4.6.1	Text and images of text have a contrast ratio of at least 7:1.
WG 1.4.6.2	Large text (over 18 point or 14 point bold) has a contrast ratio of at least 4.5:1
WG 1.4.7	*1.4.7 Low or No Background Audio (Level AAA)*
WG 1.4.7.1	Audio of speech has no or very low background noise so the speech is easily distinguished.

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WG 1.4.8	***Visual Presentation (Level AAA) Blocks of text over one sentence in length:***
WG 1.4.8.1	Are no more than 80 characters wide.
WG 1.4.8.2	Are NOT fully justified (aligned to both the left and the right margins).
WG 1.4.8.3	Have adequate line spacing (at least 1/2 the height of the text) and paragraph spacing (1.5 times line spacing).
WG 1.4.8.4	Have a specified foreground and background color. These can be applied to specific elements or to the page as a whole using CSS (and thus inherited by all other elements).
WG 1.4.8.5	Do NOT require horizontal scrolling when the text size is doubled
WG 1.4.9	***Images of Text (No Exception) (Level AAA)***
WG 1.4.9.1	Text is used within an image only for decoration (image does not convey content) OR when the information cannot be presented with text alone.
WG 2.1	***Keyboard Accessible: Make all functionality available from a keyboard***
WG 2.1.1	***Keyboard (Level A)***
WG 2.1.1.1	All page functionality is available using the keyboard, unless the functionality cannot be accomplished in any known way using a keyboard (e.g., free hand drawing).
WG 2.1.1.2	Keyboard focus is never locked or trapped at one particular page element. The user can navigate to and from all navigable page elements.
WG 2.1.1.3	All page functionality is available using the keyboard.
WG 2.2	***Enough Time: Provide users enough time to read and use content***
WG 2.2.1	***Timing Adjustable (Level A)***
WG 2.2.1.1	If a page or application has a time limit, the user is given options to turn off, adjust, or extend that time limit. This is not a requirement for real-time events (e.g., an auction), where the time limit is absolutely required, or if the time limit is longer than 20 hours.

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	Suppliers may deviate from this guideline if their planned solution is conflicting with security requirements. If so, the supplier must document why they deviate.
WG 2.2.2	**Pause, Stop, Hide (Level A)**
WG 2.2.2.1	Automatically moving, blinking, or scrolling content that lasts longer than 3 seconds can be paused, stopped, or hidden by the user. Moving, blinking, or scrolling can be used to draw attention to or highlight content as long as it lasts less than 3 seconds. *The user must be able to turn off visual effects such as blinking, automatic updates etc (From the Norwegian association of the Blind and Partially Sighted).*
WG 2.2.2.2	Automatically updating content (e.g., automatically redirecting or refreshing a page, a news ticker, AJAX updated field, a notification alert, etc.) can be paused, stopped, or hidden by the user or the user can manually control the timing of the updates.
WG 2.2.3	**No Timing (Level AAA)**
WG 2.2.3.1	The content and functionality has no time limits or constraints. *Suppliers may deviate from this guideline if their planned solution is conflicting with security requirements. If so, the supplier must document why they deviate.*
WG 2.2.4	**Interruptions (Level AAA)**
WG 2.2.4.1	Interruptions (alerts, page updates, etc.) can be postponed or suppressed by the user.
WG 2.2.5	**Re-authenticating (Level AAA)**
WG 2.2.5.1	If an authentication session expires, the user can re-authenticate and continue the activity without losing any data from the current page. *Suppliers may deviate from this guideline if their planned solution is conflicting with security requirements. If so, the supplier must document why they deviate.*
WG 2.3	**Seizures: Do not design content in a way that is known to cause seizures**
WG 2.3.1	**Three Flashes or Below Threshold (Level A)**

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WG 2.3.1.1	No page content flashes more than 3 times per second unless that flashing content is sufficiently small and the flashes are of low contrast and do not contain too much red. (See general flash and red flash thresholds)
WG 2.3.2	*Three Flashes (Level AAA)*
WG 2.3.2.1	No page content flashes more than 3 times per second.
WG 2.4	*Navigable: Provide ways to help users navigate, find content, and determine where they are*
WG 2.4.1	*Bypass Blocks (Level A)*
WG 2.4.1.1	A link is provided to skip navigation and other page elements that are repeated across web pages.
WG 2.4.1.2	If a page has a proper heading structure, this may be considered a sufficient technique instead of a "Skip to main content" link. Note that navigating by headings is not yet supported in all browsers.
WG 2.4.1.3	If a page uses frames and the frames are appropriately titled, this is a sufficient technique for bypassing individual frames.
WG 2.4.2	*Page Titled (Level A)*
WG 2.4.2.1	*The web page has a descriptive and informative page title.*
WG 2.4.3	*Focus Order (Level A)*
WG 2.4.3.1	The navigation order of links, form elements, etc. is logical and intuitive.
WG 2.4.4	*Link Purpose (In Context) (Level A)*
WG 2.4.4.1	The purpose of each link (or form image button or image map hotspot) can be determined from the link text alone, or from the link text and it's context (e.g., surrounding paragraph, list item, table cell, or table headers).
WG 2.4.4.2	Links (or form image buttons) with the same text that go to different locations are readily distinguishable.
WG 2.4.5	*Multiple Ways (Level AA)*

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WG 2.4.5.1	Multiple ways are available to find other web pages on the site – at least two of: a list of related pages, table of contents, site map, site search, or list of all available web pages.
WG 2.4.6	**Headings and Labels (Level AA)**
WG 2.4.6.1	Page headings and labels for form and interactive controls are informative. Avoid duplicating heading (e.g., "More Details") or label text (e.g., "First Name") unless the structure provides adequate differentiation between them.
WG 2.4.7	**Focus Visible (Level AA)**
WG 2.4.7.1	It is visually apparent which page element has the current keyboard focus (i.e., as you tab through the page, you can see where you are).
WG 2.4.8	**Location (Level AAA)**
WG 2.4.8.1	If a web page is part of a sequence of pages or within a complex site structure, an indication of the current page location is provided, for example, through breadcrumbs or specifying the current step in a sequence (e.g., "Step 2 of 5 – Shipping Address").
WG 2.4.9	**Link Purpose (Link Only) (Level AAA)**
WG 2.4.9.1	The purpose of each link (or form image button or image map hotspot) can be determined from the link text alone.
WG 2.4.9.2	There are no links (or form image buttons) with the same text that go to different locations.
WG 2.4.10	**Section Headings (Level AAA)**
WG 2.4.10.1	Beyond providing an overall document structure, individual sections of content are designated using headings, where appropriate.
WG 3.1	**Readable: Make text content readable and understandable**
WG 3.1.1	**Language of Page (Level A)**
WG 3.1.1.1	The language of the page is identified using the HTML lang attribute (<html lang="en">, for example).
WG 3.1.2	**Language of Parts (Level AA)**

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WG 3.1.2.1	When appropriate, the language of sections of content that are a different language are identified, for example, by using the lang attribute (<blockquote lang="es")>
WG 3.1.3	**Unusual Words (Level AAA)**
WG 3.1.3.1	Words that may be ambiguous, unknown, or used in a very specific way are defined through adjacent text, a definition list, a glossary, or other suitable method.
WG 3.1.4	**Abbreviations (Level AAA)**
WG 3.1.4.1	Expansions for abbreviations are provided by expanding or explaining the definition the first time it is used, using the <abbr> element, or linking to a definition or glossary. NOTE: WCAG 2.0 gives no exception for regularly understood abbreviations (e.g., HTML on a web design web site must always be expanded).
WG 3.1.5	**Reading Level (Level AAA)**
WG 3.1.5.1	A more understandable alternative is provided for content that is more advanced than can be reasonably read by a person with roughly 9 years of primary education.
WG 3.1.6	**Pronunciation (Level AAA)**
WG 3.1.7.1	If the pronunciation of a word is vital to understanding that word, its pronunciation is provided immediately following the word or via a link or glossary.
WG 3.2	**Predictable: Make web pages appear and operate in predictable ways**
WG 3.2.1	**On Focus (Level A)**
WG 3.2.1.1	When a page element receives focus, it does not result in a substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user.
WG 3.2.2	**On Input (Level A)**
WG 3.2.2.1	When a user inputs information or interacts with a control, substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user unless the user is informed of the change ahead of time.

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WG 3.2.3	***Consistent Navigation (Level AA)***
WG 3.2.3.1	Navigation links that are repeated on web pages do not change in order when navigating through the site
WG 3.2.4	***Consistent Identification (Level AA)***
WG 3.2.4.1	Elements that have the same functionality across multiple web pages are consistently identified. For example, a search box at the top of the site should always be labeled the same way.
WG 3.2.5	***Change on Request (Level AAA)***
WG 3.2.5.1	Substantial changes to the page, the spawning of pop-up windows, uncontrolled changes of keyboard focus, or any other change that could confuse or disorient the user must be initiated by the user. Alternatively, the user is provided an option to disable such changes.
WG 3.3	***Input Assistance: Help users avoid and correct mistakes***
WG 3.3.1	***Error Identification (Level A)***
WG 3.3.1.1	Required form elements or form elements that require a specific format, value, or length provide this information within the element's label (or if a label is not provided, within the element's title attribute).
WG 3.3.1.2	If utilized, form validation cues and errors (client-side or server-side) alert users to errors in an efficient, intuitive, and accessible manner. The error is clearly identified, quick access to the problematic element is provided, and user is allowed to easily fix the error and resubmit the form.
WG 3.3.2	***Labels or Instructions (Level A)***
WG 3.3.2.1	Sufficient labels, cues, and instructions for required interactive elements are provided via instructions, examples, properly positioned form labels, and/or fieldsets/legends.
WG 3.3.3	***Error Suggestion (Level AA)***
WG 3.3.3.1	If an input error is detected (via client-side or server-side validation), provide suggestions for fixing the input in a timely and accessible manner.
WG 3.3.4	***Error Prevention (Legal, Financial, Data) (Level AA)***

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WG 3.3.4.1	If the user can change or delete legal, financial, or test data, the changes/deletions are reversible, verified, or confirmed.
WG 3.3.5	**Help (Level AAA)**
WG 3.3.5.1	If the user can submit, change, or delete information, the information is reversible, verified, or confirmed.
WG 3.3.6	**Error Prevention (All) (Level AAA)**
WG 3.3.6.1	If the user can submit information, the submission is reversible, verified, or confirmed.
WG 4.1	**Compatible: Maximize compatibility with current and future user agents, including assistive technologies**
WG 4.1.1	**Parsing (Level A)**
WG 4.1.1.1	Significant HTML/XHTML validation/ parsing errors avoided
WG 4.1.2	**Name, Rule, Value (Level A)**
WG 4.1.2.1	Markup is used in a way that facilitates accessibility. This includes following the HTML/XHTML specifications and using forms, form labels, frame titles, etc. appropriately.

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5.   Other accessibility and usability requirements

The supplier also must meet the following requirements:

No.	Requirements
AU 1	HTML must be structured according to the logical information flow on a page so that users with assistive devices will be able to get the same order of information as users without special needs.
AU 2	Cross-platform independence for the e-voting client. The e-voting client must work well for most browsers and operating systems. The supplier must list browsers and operating systems that support the e-voting client.
AU 3	The system shall present the end-user with an option to change language when using the application. This means that all content should be presented in the selected language including file attachments providing translated versions have been uploaded to a database.
AU 4	File attachments formats should be presented in the following formats: • PDF – 1.4 or newer, or PDF/A – ISO 19005-1 (Where the intent is to keep the original look and feel of a document) • ODF – ISO/IEC 26300 (Documents that the users can modify after download) Note that PDF is difficult for users with visual impairments. Today Microsoft Windows is the most widely used operating system for people with disabilities 2. This means that companies developing assistive devices have mainly been focusing on one OS. This gives an advantage for users with disabilities even if monopoly has its own challenges. Microsoft has an open file format Open Office XML (OOXML) which could be added as to compliment the two others as OOXML is a more accessible format than PDF and ODF (1.0)
AU 5	For the e-voting client, pages should be designed so that they do not exceed 200 kb
AU 6	The system shall be unit independent i.e. the user must be able to use the system on different PCs, independent of the PC that was used first time around.
AU 7	The system shall be flexible/elastic and function well within standard resolution ranges (from 800x600 and up).
AU 8	The system shall present the user with options to change text sizes and contrast in any browser.
AU 9	The system shall work with mouse pointers and keyboards in a consistent and standard manner. This also applies to entry fields, radio buttons, drop-down lists etc.
AU 10	Font types such as Thiresias (http://www.tiresias.org/fonts/index.htm - developed especially for users with visual disabilities), Arial or Verdana should be considered. Serifs should be avoided. It must be possible to change the font sizes to 14-16pt (dependent on font type) and larger. Fonts should not be in italics, capital letters or have effects such as for example blinking text. *(From the*

No.	Requirements
	Norwegian association of the Blind and Partially Sighted.)
AU 11	The supplier must make login and authorization as accessible and user friendly as possible. This is normally the first and largest hindrance for users with visual disabilities *(From the Norwegian association of the Blind and Partially Sighted.)* For the e-voting client, the usability and accessibility of the login and authorization mostly depends on the solution for the forthcoming Common Authentication Infrastructure (CAI) provided by Difi.
AU 12	The supplier must while maintaining high user-friendliness for the solution, remove as many technology-related barriers as possible for the users. For the e-voting client, the suppliers shall NOT use applets, flash, plug-ins, etc. for interaction purposes, and otherwise (for instance for authentication and encryption of ballots to be cast) keep the need for users to download and use these technologies to a minimum.
AU 13	Use of JavaScripting for interaction purposes, will possibly have a negative effect on the user experience for users with assistive devices and should be kept to a minimum. See also AU 1.
AU 14	The response time shall be optimized for all requests with a maximum response time of 2 seconds unless there is a good reason why it should be higher. Response time is measured from the time that the user performs the action that says "Go" until the user receives enough feedback from the computer to continue the task. It is the user's subjective wait time. If expected response time is longer than 2 seconds, the user must be given sufficient feedback during the wait time. If expected response time is longer than 10 seconds, the user must also be notified/warned beforehand.

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6.   Methodology requirements

The supplier also must meet the following requirements:

No.	Requirements
M 1	The supplier shall document how accessibility and usability ties in with overall the development process/methodology.
M 2	The supplier shall document accessibility test strategy, how they intend to implement accessibility routines and what tools they intend to use for accessibility validation during development.
M 3	The supplier shall document usability test strategy, including methodology and how they intend to implement usability routines within the development team and with regards to the project phases.
M 4	The supplier shall provide support to external consultants, independent people that will be brought in to test the solution
M 5	The supplier shall document how the design process ties in with the overall development process.