ADVANCED MULTIMEDIA COMPONENT DESIGN

How might we make conforming with guidelines more straightforward?

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ABSTRACT
Computers nowadays has become the most used piece of technology in the industry, however during development and planning there are guidelines that need to be followed. A possible solution when it comes to guidelines or the requirements is to come up with a checklist or write them down on a piece of paper, however when it comes to guidelines they can be problematic to begin with as people have different approaches to follow guidelines as everyone has a different way of thinking and completing a task and how they would interact with the guidelines given.

This paper will address the question of how might we make conforming with guidelines more straightforward and involves research and interviews with some of the first year students on what their thoughts are regarding the question addressed. These sessions will provide the highest levels of engagement and their ways of coming up with an ideal solution to answer the question.

AUTHOR'S KEYWORDS
Human-centred; testing; questionnaires; understanding; social interaction; educational purposes;

GENERAL TERMS
Experimentation, Human Factors, Opinions, Group Discussions, Data Gathering

KEYWORDS
Straightforward, guidelines, interaction, theories, knowledge, experience

1. INTRODUCTION

When going through the computing workplace or going through any kind of workplace, there is a large amount of guidelines that need to be followed to allow a project to be successful which also applies in education such as coursework and assessments where you would need to follow guidelines or the requirements to pass the module which can be difficult for some students.

Guidelines tend to act as stepping stones or a checklist while going through studies, sometimes they are helpful to the students while at times the guidelines may be too difficult to understand and will ask for a lecturer and discuss a certain part of the guidelines they are not so sure about. As everyone will have a different approach on meeting guidelines and that everyone's brain functions differently.

A series of questions have been developed and held along with supervision of the researcher who performed the focus groups for the participants who are in their first year of study at University and to engage their opinions on how guidelines can be more straightforward.

This was held during the first semester an the lecturer has contacted various students to take part in this experiment these interviews are for educational purposes and results are confidential and will not be passed on to anyone who isn't authorised in this experiment.

Participant students will read some guidelines and will be asked questions on what their thoughts are and how well do you understand these guidelines and finally what can we do to make these guidelines more straightforward and also discussions from past experiences about meeting guidelines.

2. RELATED WORK

According to the guidelines document, Guidelines for computing summary statistics for data-sets containing non-detects which was written by C. Huston and E. Juarez-Colunga [1] there are three approaches for treating data containing censored values 1. Substitution which gives poor results and therefore is not recommended in the literature; 2 maximum likelihood estimation, which requires an assumption of some distributional form; and 3. And nonparametric methods which assess the shape of the data based on observed percentiles rather than a strict distributional form.

The next article Developing privacy Guidelines for Social Location Disclosure Applications and Services [2] talks about the design guidelines for enhancing security and privacy in mobile computing have revolved around various implementations of the Fair Information Practices (FIPS) [3] these guidelines are also very general and are difficult to translate in particular suggestions for specific problems. With the present article, they try to provide a more detailed and hopefully more helpful design guidance.

Both the two articles agree on the fact that meeting the guidelines is quite demanding and can be at times difficult to follow as the second article adds that although generally applicable principles are difficult to devise, especially in the case of relativity uncharted domains such as ubiquitous computing, for specific applications, thoughtfully applying narrowly defined design guidelines can help designers. The following guidelines should be viewed in this light, more as suggestions than mandatory rules.

However there has been arguments [4] that it seems that guidelines are ubiquitous. In the disability field, two prominent ones are the Web Accessibility Initiative (WAI) guidelines (W3X (world Wide Web Consortium) Web Accessibility Initiative 1999), and the regulatory standards for US government purchasing, 'Section 508' (Architectural and Transportation Barriers Compliance Board, 2000). There are many more national and international guidelines on how to develop all manner of Information and Communication Technologies (ICT). In Computer Human Interaction some researchers and standards committees have been looking into the quality of guidelines in terms of how well they meet the needs of their intended users (e.g., (Stewart and Travis, 2003)).

There has been an ideal solution to address the problem [4] by taking in account of the WAI model (Web Accessibility Initiative) The WAI promotes a tripartite model of accessibility, with the goal of universal Web Accessibility in theory provided by full conformance with each of three components [5], Of particular relevance to developers of Web resources in the Web Content Accessibility Guidelines (WCAG) [6]. WAI has been successful in promoting the WCAG around the world, the guidelines having been adopted by many organizations, embraced by the Web Standards movement [7] and are increasingly being adopted at a national level [9].

3. METHODOLOGY

The aim of this work is to examine a way of how might we make conforming with guidelines more straightforward while studying a course which is associated with computing or digital media. Focus groups have been developed to gather the data needed to begin this study. Data is recorded via an audio recorder app. These results will be noted and compared with each of the participants. The way this experiment will be settled will be separated the participants into 2 focus groups (3 students that study Digital Media and the other 4 that study Computer Graphics and Animation) these focused groups will consist of questions being asked and one by one a participant will give his/her answer on the selected question while participants can either agree or disagree on the answer that is given (to make the participants feel at home there will be refreshments at the focus groups.

3.1 EXPERIMENTAL VARIABLES

Participants are given a questionnaire which is used as a dependent metric. Questions answered and participants will either agree or disagree on a participants answer and standard class engagement was used as independent metrics.

3.2 PARTICIAPNTS

A total of 8 participants (5 male, 3 female) participated in this work. Participants were all aged 17-23 and are students at Robert Gordon University and are all studying in the same module, studying a computing and digital media based course.

3.3 MATERIALS AND EQUIPMENT

3.3.1 Focus Groups/Interviews

Focus Groups and Interviews were given during the first semester which ran through the next two weeks. One Focus Group had ran through one day with a coffee and sweeties for refreshments. Since most of the participants are in the same class and are studying a similar course which is based on either computing or digital media. Emails have been sent via to computing and digital media students from Robert Gordon University. The wider promotion ensured that pupils who would attend these focus groups will help with their overall grade in their module that they are studying and will receive the data which is being gathered for this experiment.

The aim of these focus groups was to provide a way to make conforming with guidelines more straightforward this had involved the knowledge and experience with known guidelines such as the Web Accessibility Initiative Guidelines or Web Content Accessibility Guidelines and about how they used them when it comes to meeting the guidelines in their own coursework in their university modules. What also will be in these focus groups is if there any issues such as ethical or legal issues to guidelines and if there was any risks taken when conforming with selected guidelines. A second focus group has been held due to timetable restrictions and for the participants to concentrate on other things such as studies and work commitments.

The remainder of this section introduces how the data has been gathered while going through the questions.

The data has been gathered through the Samsung Voice Recorder App on a Samsung Galaxy S8 as it is said by the play store website [10] it is used to record audio and to is a gathering data tool for my focus groups the microphone app will be passed on to each member of the focus groups and they will answer the question that is asked in this research experiment. For everyday needs, a “Voice Memo” recording mode was developed so voice can be converted to text and is free to install due to the high quality of sound it was clear to record the data and the participant’s voices and was easy to write down on paper for getting the required results.

Participants were invited to these focus groups in a quiet room so data gathering will be much easier without people form the other side of the room chatting away or having a carry on so the focus groups can go on and get questions asked and participants sharing their theory on the question

and a participant will either agree or disagree and everyone will continue to discuss their answers throughout the focus groups. Everyone will have their own interesting ideas and answers.

3.3.2 Questions

Both focus groups were asked these set of questions.

1) What do you know about guidelines when it comes to computing in your course?
2) Do you have any experience when it comes to guidelines (any good or bad experiences)
3) How did you overcome these guidelines when you were in this situation
4) What should we consider when it comes to guidelines (such as impairments either physical, visual, audible or communication etc)
5) If you can pass on any advice for making guidelines more straightforward what would it be?
6) Does anyone have anything else they want to add to anyone's answers?
7) Is there anything else you guys want to add before we close this group?

For the two focus groups during this experiment the use of questions were produced and given to the participants to discuss with each other so everyone in these groups are involved and no one sat out or felt left out while carrying out this experiment. There are 8 questions in this experiment. 8 questions were reasonable and the participants were not held in one meeting room the whole day and these focus groups would focus on how might we make conforming with guidelines more straightforward. Ethics forms and signature were given before they started to answer the question in these focus groups. The 7 questions went into concept of what they knew about guidelines, what experiences everyone had, how to overcome them in a situation, what to consider when it comes to legal, ethical or professional issues or id there are any risks to take, what advice can be passed on, if anyone agrees or disagrees with someone's answer and if there was anything else they wanted to add or if there is something else they want to discuss about the topic which will benefit in gathering data.

3.3.3 Additional Feedback Questionnaire

Once the Focus Groups have been completed, participants were contacted by email and invited to comment their feedback through another questionnaire (on a scale of 1-10 etc.) Participants will be asked whether they enjoyed the experience or not, providing justification for this also.

3.4 PROCEDURE

The focus groups were organised with Robert Gordon University. As part of these focus groups, participants are given questions to answer for the following week and the answers are recorded in a voice recorder app on a mobile phone and the focus groups will engage in one another's answers on whether they agree or not with what was said during these focus groups.

3.5 ANALYSIS

The purpose of analysis is to provide a comparisons between the participants perceived experience and knowledge about guidelines in computing and how might we make conforming with them to be straightforward.

Due the small sample sizes, everyone's answers will be given through the mp3 sound recording and the results are compared on whether who has the better approach to the question and who's answer would be the most useful way to make conforming with guidelines more straightforward.

Quantitate analysis is further explained through an interpretation of qualitative responses gathered from the Additional Feedback Questionnaire.

4. RESULTS

Due to the small group sizes during the focus groups, analysis has gathered up the required data and then been recorded and have been looked at for evaluation and the reasoning for this ideal solution. Everyone has an interesting idea while carrying out this experiment when it comes to guidelines.

The results given from the participant is that everyone has an understanding on what guidelines in computing are especially when making them straightforward. All of the participants are most familiar with the Web Content Accessibility Guidelines. The W3C website states that the Web Content Accessibility Guidelines (WCAG) is developed through he W3C process, in cooperation with individuals and organizations and governments internationally, the website adds that the WCAG documents explain how to make web content more accessible to people with disabilities. Web "content" generally refers to the information in a web page or web application including: natural information such as text, images and sounds and code or mark-up that defines structure, presentation etc. [11] two of the participants were unaware that these guidelines exist.

The participants also explained that the guidelines are very strict especially for those with disabilities, especially those with blind, deaf or any kind of impairments though **Participant 5** has said that "Dyslexia should be heavily considered by using short cuts such as alt tags in images and the use of simple text, images and nice colours."

All participants have had experience with trying to make guidelines more straightforward especially in terms of Web Design, everyone added that some disabilities need to be heavily considered and that it is hard for the participants themselves to understand and especially when it comes to designing static and dynamic sites and for using percentages to make the screen responsive to

multiple devices such as phones and tablets. Most of the participants didn't think much of it and focus on getting marks for coursework and drew concern on colour schemes and for alt tags

The ways how meeting the guidelines according to the participants was to look online for a suitable list or template and to make sure that the website requirements are all ticked off and to overcome the problem and with legislation that is needed is to run through w3c to make sure everything is on track, and also to look at the Google search engine as it can be quite tedious to look through all of the code that is written. A participant didn't have a way to overcome the guidelines it was more or less submitting what was done and had this sense of empathy towards the work, a participant has come from a different education system before coming to university, and was having a hard time understanding the guidelines unaware of any written work that was required and relies heavily on the grading scheme instead of the actual guidelines, some just cracked on and got on with the coursework and looked online for the relevant resources.

Now there are a lot of considerations to be made while making guidelines more straightforward in the roots of dyslexia prefer colour screens, enlarged text, while most prefer text is blown up to a bigger proportion, and also to research one accessibility issue that you are not familiar with. Now there is an interesting point that hidden ones don't get the recognition it deserves for websites it is challenging as the developers wouldn't know if someone is blind. Guidelines alone are grouped down, there can be some issues that come up and others that are lost. Now a participant gave an interesting hindsight that there a lot of entanglement of long words, and one must try to understand on the word to word level, before going into the specifics, **participant 7** agrees that "The guidelines are too tangled and should act as a guide to give an explanation and demonstrate how to implement, but not necessarily ruin but change your product and also to take in account of how a user's experience to a website and to take in consideration."

The participants add that there are issues and risks that are being considered with the guidelines especially the like of legal and ethical issues such as copyright and law suits occurring for not following the guidelines due to a website not being accessible and that these issues are taken very seriously especially when it comes to the real world working industry. There was an ethical issue according to **Participant 6** "To meet a deadline one would argue that the web is for everyone."

The advice given from the participants about how to make guidelines more straightforward in this experiment was to create a small list that has all the points instead of waffling on with unnecessary text and ensure the ethical issues are addressed, use of specific software to make code accessible like speech recognition which is time consuming but gets the job done. An good example of advice which was given was to do the background research and try to design it for your audience, try to keep it broad instead of blowing your bubble, make something like a program or just code and to have an interface as good as possible, also to emphasise the idea the empathy of the audience forget we are making content for ourselves for the assessment board, bringing empathy to the workflow as possible and the use of colour blind text as well as last minute accessibility is not considered as accessibility.

Getting these results to answering my research question just showed how much data I was gathering for my research. The higher the percentage the higher the commitment the participants had for helping addressing a way to make guidelines more straightforward. The data is more efficient through participant 1-5 which is more or less the first focus group. They went into further discussions about experiences and ways to make guidelines simple by stating a way to overcome them by explaining to reduce the original guidelines as a tick and box/checklist and the first focus group took in consideration about accessibility issues as well such as users that are blind or deaf and incidents that occurred when a product doesn't meet the guideline as participant 1 used the 2001 Olympic website incident as a fine example of not meeting the guidelines.

Despite the second focus group being last minute it was understandable that the response was mixed while participating in the second focus group there wasn't much data gathered to answer the question the answers were very similar to the first focus groups answers like reducing the guidelines to a shorter document or checklist and to do the research and work on the feedback that was given to your lecturer.

4.1 QUESTIONNAIRE

1) On a scale of 1-10 how did you like being a part of the focus group?
2) Did you feel you learnt something out of this?
3) What do you feel could have done better?
4) Do you think this was helpful?
5) Was the experience professional?
6) What you take part in a focus group with a similar based question?

4.2 QUESTIONNAIRE RESULTS

The two focus groups performed for this experiment has received mostly positive feedback from all the participants. Most of the participants have agreed that the two focus groups were handled professionally and everyone has stated that that learned something new out of this which is good and can help in the computing industry for when it comes to making guidelines more straightforward and on a scale of 1 to 10 the results have been mostly 8-10 which is a good reaction from the participants, however they are some feedback on what to do next time while performing a focus group such as

getting a room to reduce any background sound, open conversations instead of individual questions was suggested which would be more interactive, asking if the participants would take part in a similar focus group to the two which was undertaken received a mixed response as its mostly maybes, however a participant has been quite strict and had a negative reaction towards the questionnaire and felt that the information was nothing new and wouldn't be interested in taking part in a similar style of focus group which was performed.

5. DISCUSSION

This study set out with the aim of how might we make conforming guidelines more straightforward between the participants that are studying a course relevant to computing or digital media. Prior studies have noted the importance of theories on meeting guidelines to be more straightforward. Data has been gathered and during this experiment and the results have been calculated.

5.1 FOCUS GROUP DISCUSSION

In the two focus group sessions that was used to know of everyone's understanding and a way of how the participants overcame guidelines regarding either in university or in the industry, most of the participants are mostly familiar with the Web Accessibility Guidelines and the W3C and they all agree on the fact that that it is a long list of requirements and outdated and is not usually considered, everyone came to agreement that the guidelines are strict and gets everyone involved and has solutions to make things accessible for example the use of alt tags, simple text, colour and suitable headings as **participant 5** has said "Since there are things such as dyslexia that needs to be taken in consideration since when it comes to meeting guidelines everybody focuses only on the blind and the deaf but never anything else that can be serious."

In the second question of the focus group was whether the participants have had any experience. Most of the participants have had experience to a web design module last year which has been quite difficult to follow the guidelines and was unsure how to perform the task required from the lecture that was a good starting point in the research since everyone in the group has had experience both good and bad, **participant 2** has come up with an interesting point that "In certain points of web accessibility disabilities are not necessarily go far enough when in terms of disabilities as most industries crack on with building a website and not addressing the accessibility issues.", **participant 6** feels "The guidelines act as a bonus when it comes to coursework and ensures that a website is accessible as a majority of websites nowadays are inaccessible.", however **participant 8** only concern on meeting guidelines only to get more marks for their coursework.

The solutions for making guidelines more important in the participants view was to use the internet to their advantage and to do some background research and look for a more narrowed down version of the w3c or other web accessibility guidelines which are easy to follow and to understand by ticking off the requirements that are in the guidelines, **participant 4** made a mention of "Using the Google search engine to reduce the time of looking online as it is quite tedious and for looking at the code for a solution which is time consuming.", however **Participant 6** didn't come up with a way of overcoming the guidelines it was just submitted than received feedback from the results, while **participant 7** has come from a different education system, ignoring the fact that there were very specific points that were missed out such as documentation and felt with the use of a grading scheme and guidelines it will be easier to crack on with the documentation.

For the considerations of making guidelines more straightforward **participant 2** has discussed that "Basically all suggestions in the roots of dyslexia are unable to use the internet unless it has the technical enhancements such as colour screens, enlarged text, most prefer text is blown up to a bigger proportion, hitting the zoom in (speech software) can't stand people clicking onto speech software, in terms of that (going on an Ipad it is personal preference it gets you second and first time) terms of clearness and speech in a large area the reduction of noise." while **participant 7** feels "That the words are too tangled and provide you a guide of explanations and examples to implement which could heavily change the final product which could affect the experience to a website which should be taken into consideration.

All participants agree that there are risks that are taken which it comes to making guidelines more straightforward such as issues like professional, legal and ethical issues. **Participant 1** came up with an important reason why you must meet the guidelines by discussing the Olympic website back in 2001 which was taken down right after it has been deployed to the public due to being inaccessible, copyright was an important thing to consider if there are risks when it comes to the real world industry when an employer asks how you got that photo or that graphic style with the credit or the permission of the author it will look bad on you, since in education it is not that considered since the briefs are fake.

Advice given from all the participants was to create a short list of the guidelines instead of waffling along a 100 page document and go straight to the point, and to trim them down. **Participant 3** has come up with a statistic that "33% of websites don't know if they are accessible for people to understand and get confused from it and that there are a lot of other disabilities out there that are not getting the recognition they deserve." **participant 5** has stated "In general there would be a long list of what to do and to take account in features to those who are blind and have decreased motor functions have to use speech software to access your website." **participant 3** states that "Some developers don't know if their websites are accessible use of a common software to analyse the website to accessible to major groups and see where to go and add to help people with the less popular groups." **Participant 6** emphases the idea the empathy of the audience forget we are making websites for ourselves, doing things for the assessment board, we

think about that to bring that empathy to the workflow as possible, use of a colour blind text (last minute accessibility is not considered as accessibility.)

5.2 LIMITATIONS AND FUTURE WORK

Results from the study are encouraging and the responses from the participants have been mostly positive from the focus groups despite 2 participants given the experience a 5 (due to a last minute focus group) though agreed on the fact that it was very professional. Most results felt that a way to make guidelines straightforward was to trim them down into smaller and easier words to understand.

Future engagement with computing classes in university should be conducted to determine for an ideal solution of students meeting the guidelines and making them more straightforward.

6. CONCLUSION

This paper has reported on a series of focused groups that were used in conjunction with gathering data and an ideal solution of how we might make conforming with guidelines more straightforward at the Robert Gordon University in Aberdeen. The purpose of this work is to listen to the participants experience, understanding and theories of how we can make meeting guidelines more straightforward.

The research performed in this problem was to address how to make the guidelines more straightforward and easier to follow in terms of coursework or anything else in the computing industry was to narrow down the rules and create a shorter list with the specific guidelines that is related to any kinds of work instead of waffling on with unnecessary text and get straight the point. Also conclusion was to do some background research on a disability which you have never heard about for example, developers tend to forget about people that may suffer from dyslexia and how we can make guidelines straightforward for them that are dyslexic by taken in consideration of using text, titles and the appropriate colour. Another solution was to receive feedback on work what you have done by a professional (like a lecturer) to look over it and address what you would need to do to pass the module or some other things that you would need to add.

What was wanted out of this research experiment was to get a straightforward solution to making guidelines or the requirements from a brief to be met and how it can be put into play in the real world and in the industry, the answers form the participants will benefit of meeting the requirements needed when the guidelines are nicely narrowed down and at a suitable format for people to understand and to be easy to follow when it comes to performing the task at hand.

The research being done in this paper will be a big help especially with students that are struggling to meet the guidelines in their coursework and will use this paper as a guide to address the problem that they might have and to meet the requirements in their brief in their college/university studies.

One of the answers that was given was to reduce the unnecessary text in the guidelines and to create a check list with the most important points included in the checklist. Since most requirements and guideline documents tend to have large amount of text and pages that can be tedious to read through.

Another answer to address the research question was to do some background research on hidden disabilities and dyslexia as said by one of the participants to take in account of meeting the requirements as there is a lot of disabilities to take in consider.

The last answer was to receive feedback from professional teaching staff (lecturers) on whether or not that you have addressed or met the guidelines correctly in your coursework, once the feedback is received it will give you an insight of what you would need to do next and a way to reduce having the same problem again in the future while going through your coursework ensuring that you have met the guidelines appropriately.

What could have done to make the research more beneficial was to get more recruits and to make the focus groups more interactive and more fun as most participants looked bored through the interview process. What could have been done better was to have more questions and more which make more sense and to get a room which will have minimal disruptions.

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