Information Visualization - Project Report

| Maxwell Júnior  79457  Group 15  IST - Alameda | Margarida Morais  86473  Group 15  IST- Alameda | Yasser Zacarias  88647  Group 15  IST - Alameda |
| --- | --- | --- |

# INTRODUCTION

# One of the first things we are taught in school is how to read. And it is this knowledge that allows us to get most of the information in our lives. When learning, most of the time the way we gather the information we need is either through reading books, or in the present times, by reading articles on the internet and searching information through websites (i.e. Wikipedia).

# Not only is reading important when studying, but also, when reading books in our daily lives, and this is because reading helps us develop skills that are important to our wellbeing. It helps to improve your self-expression capabilities since you are extending your vocabulary, it can teach you how to deal with certain obstacles you find in life or help you to learn a new skill.

# Our desired outcome is understanding how different these habits are between different countries throughout Europe, and also try to find whether are correlations between them or not. if it has an impact in the overall picture of the demographics indicators such as the level of dropout or even high achievement in education system.

# Initially there were many questions about the subject that we wanted to answer through the visualizations, but after further study of the topic, we realized that there was a need to narrow our scope that would be feasible given our data limitations, and only to focus on the most important questions.

With this in mind, we decided to come out with the questions below, that should be answered by correlating reading habits metrics and some demographic indicators.

1. How many hours, in average, do the countries in EU spend reading?
2. What is the average income for education for level?
3. What is country reading habit and dropout rate?
4. Household expenditure in books?

## RELATED WORK

Regarding the inspiration and motivation for this work, it all began with our desire to present a work that could corelate important subjects and perhaps, untapped trends. However, theoretical lectures were also very helpful to gather useful information that guide us to structure the idea of how to encode the data, and what types of idioms to use in order to get the most out of available tools.

For our research subject specifically, we use different sources as websites, and scientific articles, to gather the highest amount of information, and data to support our subject, but most precisely reading habits across Europe. This led us to information like, time spend reading books.

In regard to implementation, we had good hints and useful examples from Eurostat, which in addition to the data, provides some visualizations on it. For example they had implemented a visualization of time spent reading books in bar chart, so it did not allow for a good assessment of the difference in terms of minutes, as the interval between minutes was too small, and it did not make a good differentiation between the colors used. However, it was a good example of what we should not do for our project.

We also like to mention that during laboratory presentations, whenever others groups presented their works, we learn and look carefully to their approach and sometimes we asked them to share the source of the code, so we could implement something similar.

**THE DATA**

If you need a 4th block for an additional author with a different affiliation, click on the table, click “layout” under “table tools”, and click “insert left” or “insert right”. Then right-click anywhere on the table, click “Table Properties”, and within the “Table” tab, click the tab box for “Preferred Width” and enter “7”.

If you need author blocks for only 1 or 2 authors, you should remove one column from the table. Right-click in the unwanted cell, click “Delete Cell”, click “Delete entire column”, then click “OK”. Repeat if necessary.

## VISUALIZATION

## What is your solution? Start with an overview of the system (layout, etc.), how it works (how data can be filtered, selected, etc) and then move on to describing the different visualization techniques, showing how each works and gets the job done.

**Rationale**

## Why did you think your techniques would work? What visual encodings did you use and why (and why not others)? What alternatives did you consider, even if they turned out not to work? Especially, discuss how you managed the complexity of real data, and matters of scalability. Also, include in your discussion the evolution of the prototype, from the initial sketches to the last version highlighting what you learned from version to version and how that influenced your design.

**Demonstrate the Potential**

This sample word document has the correct ACM SIGCHI copyright notice in place (see page 1, bottom of column 1). Accepted papers will be distributed in the conference publications. They will also be placed in the ACM Digital Library, where they will remain accessible to thousands of researchers and practitioners worldwide. ACM’s copyright and permissions policy is here:

<http://acm.org/publications/policies/copyright_policy>

**IMPLEMENTATION DETAILS**

What challenges did you find and overcome? How did you implement the links between the views (incl. brushing, etc.)? What algorithms did you use? What techniques did you adapt, or implement, from scratch? (instead of just copying & pasting them from the D3 examples page...)

Figure . Use high-resolution images, 300+ dpi, legible if printed in color or black-and-white. Number all figures and include captions below, using Insert, Caption.

## References and Citations

Use a numbered list of references at the end of the article, ordered alphabetically by last name of first author, and referenced by numbers in brackets [1,3,4].

Your references should be published materials accessible to the public. Internal technical reports may be cited only if they are easily accessible (i.e., you provide the address for obtaining the report within your citation) and may be obtained by any reader for a nominal fee. Proprietary information may not be cited. Private communications should be acknowledged in the main text, not referenced (e.g., “[Borriello, personal communication]”).

References should be in ACM citation format: <http://acm.org/publications/submissions/latex_style>. This includes citations to internet resources [1,4,8,1] according to ACM format, although it is often appropriate to include URLs directly in the text, as above.

# CONCLUSIONS AND FUTURE WORK

What did you learn? Were you able to address all the questions? If you were to start over, what would you have done differently? Also, if you now had 1 more month and €3000 do spend on this, what else would you do to enrich your solution?

The heading of a section should be in Arial 9-point bold, all in capitals (Heading 1 style). Sections should not be numbered.

## Subsections

Headings of subsections should be in Arial 9-point bold with initial letters capitalized (Heading 2 style). For sub-sections and sub-subsections, a word like *the* or *of* is not capitalized unless it is the first word of the heading.

### Sub-subsections

Headings for sub-subsections should be in Arial 9-point italic with initial letters capitalized (Heading 3 style).

# FIGURES/CAPTIONS

Place figures and tables at the top or bottom of the appropriate column or columns, on the same page as the relevant text (see Figure 1). A figure or table may extend across both columns to a maximum width of two columns, or 17.78 cm (7 in.).

Captions should be Times New Roman 9-point bold (Caption style). They should be numbered (e.g., “Table 1” or “Figure 2”), centered, and placed beneath the figure or table. The words “Figure” and “Table” should be spelled out (e.g., “Figure” rather than “Fig.”) wherever they occur.

All figures should also include alt text for improved accessibility. In Word, right click the figure, and select Format Picture | Layout | Alt Text). Papers and notes may use color figures, which are included in the page limit; the figures must be usable when printed in black-and-white in the proceedings.

The paper may be accompanied by a short video figure up to five minutes in length. However, the paper should stand on its own without the video figure, as the video may not be available to everyone who reads the paper.

## Inserting Images

Occasionally MS Word generates larger-than-necessary PDF files when images inserted into the document are manipulated in MS Word. To minimize this problem, use an image editing tool to resize the image at the appropriate printing resolution (usually 300 dpi), and then insert the image into Word using Insert | Picture | From File.



Figure . Sample of a wide figure. Be sure to place at the top or bottom of the page. Ensure that important information is legible in both black-and-white and color printing. Image: CC-BY-ND ayman on Flickr.

## Table Style

The text of tables will format better if you use the Table Text style (as in Table 1). If you do not use this style, then you may want to adjust the vertical spacing of the text in the tables. To adjust the spacing of text in a table in Word, use Home | Paragraph | Indents and Spacing. Generally, text in each field of a table will look better if it has equal amounts of spacing above and below it, as in Table 1. Table captions should be placed below the table. We recommend table lines be 1 point, 25% black. Minimize use of unnecessary table lines.

For improved accessibility, header rows of tables should be marked. In Word, right-click a header row, and select Table Properties | Row | Repeat as header…

# LANGUAGE, STYLE AND CONTENT

The written and spoken language of SIGCHI is English. Spelling and punctuation may use any dialect of English (e.g., British, Canadian, US, etc.) provided this is done consistently. Hyphenation is optional. To ensure suitability for an international audience, please:

* Write in a straightforward style.
* Try to avoid long or complex sentence structures.
* Use common and basic vocabulary (e.g., use the word “unusual” rather than the word “arcane”).
* Briefly define or explain all technical terms that may be unfamiliar to readers.
* Explain all acronyms the first time they are used in your text—e.g., “Digital Signal Processing (DSP)”.
* Explain local references (e.g., not everyone knows all city names in a particular country).
* Explain “insider” comments. Ensure that your whole audience understands any reference whose meaning you do not describe (e.g., do not assume that everyone has used an Android phone, or a particular application).
* Explain colloquial language and puns. Understanding phrases like “red herring” may require a local knowledge of English. Humor and irony are difficult to translate.
* Use unambiguous forms for culturally localized concepts, such as times, dates, currencies, and numbers (e.g., “1-5- 97” or “5/1/97” may mean 5 January or 1 May, and “seven o’clock” may mean 7:00 am or 19:00). For currencies, indicate equivalences: “Participants were paid ₩22, or roughly US$29.”
* Be careful with the use of gender-specific pronouns (*he*, *she*) and other gendered words (*chairman*, *manpower*, *man-months*). Use inclusive language that is gender-neutral (e.g., *she* *or* *he*, *they*, *s/he*, *chair*, *staff*, *staff-hours*, *person-years*). See the *Guidelines for Bias-Free Writing* for further advice and examples regarding gender and other personal attributes [9]. Be particularly aware of considerations around writing about people with disabilities.
* If possible, use the full (extended) alphabetic character set for names of persons, institutions, and places (e.g., Grønbæk, Lafreniére, Sánchez, Nguyễn, Universität, Weißenbach, Züllighoven, Århus, etc.). These characters are already included in most versions and variants of Times, Helvetica, and Arial fonts.

# Accessibility

The Executive Council of SIGCHI has committed to making SIGCHI conferences more inclusive for researchers, practitioners, and educators with disabilities. As a part of this goal, the all authors are asked to work on improving the accessibility of their submissions. Specifically, we encourage authors to carry out the following five steps:

1. Add alternative text to all figures
2. Mark table headings
3. Generate a tagged PDF
4. Verify the default language
5. Set the tab order to “Use Document Structure”

For more information and links to instructions and resources, please see: <http://chi2016.acm.org/accessibility>.

# Page Numbering, Headers, and Footers

Your final submission should not contain footer or header information at the top or bottom of each page. Specifically, your final submission should not include page numbers. Initial submissions may include page numbers, but these *must* be removed for camera-ready. Page numbers will be added to the PDF when the proceedings are assembled.

# Producing and testing PDF files

We recommend that you produce a PDF version of your submission well before the final deadline. Your PDF file must be ACM DL Compliant. The requirements for an ACM Compliant PDF are available at:

<http://sheridanprinting.com/typedept/ACM-distilling-settings.htm>

When creating your PDF from Word, ensure that you generate a tagged PDF from improved accessibility. This can be done by using the Adobe PDF add-in, also called PDFMaker. Select Acrobat | Preferences from the ribbon and ensure that “Enable Accessibility and Reflow with tagged Adobe PDF” is selected. You can then generate a tagged PDF by selecting “Create PDF” from the Acrobat ribbon. Test your PDF file by viewing or printing it with the same software the publisher will use, Adobe Acrobat Reader Version 10, which is widely available at no cost. Note that most reviewers will use a North American/European version of Acrobat Reader, so please check your PDF accordingly.

# Conclusion

It is important that you write for the SIGCHI audience. Please read previous years’ proceedings to understand the writing style and conventions that successful authors have used. State clearly what you have done, not merely what you plan to do, and explain how your work is different from previously published work, i.e., *the unique contribution that your work makes to the field*. Please consider what the reader will learn from your submission, and how they will find your work useful. If you write with these questions in mind, your work is more likely to be successful, both in being accepted into the conference, and in influencing the work of our field.

# ACKNOWLEDGMENTS

Sample text: We thank all the volunteers, and all publications support and staff, who wrote and provided helpful comments on previous versions of this document. Authors 1, 2, and 3 gratefully acknowledge the grant from NSF (#1234-2012-ABC). This is just an example.

# References format

References must be the same font size as other body text. References should be in alphabetical order by last name of first author. Example reference formatting for individual journal articles [3], articles in conference proceedings [7], books [9], theses [10], book chapters [11], an entire journal issue [6], websites [1,4], tweets [1], patents [5], and online videos [8] is given here. This formatting is a slightly edited version of the format automatically generated by the ACM Digital Library (http://dl.acm.org) as “ACM Ref”. More details of reference formatting are available at:

<http://www.acm.org/publications/submissions/latex_style>

Note that the Hyperlink style used throughout this document uses blue links; however, URLs that appear in the references section may appear in black.

# REFERENCES

1. @\_CHINOSAUR. 2014. VENUE IS TOO COLD. #BINGO #CHI2016. Tweet. (1 May, 2014). Retrieved February 2, 2014 from https://twitter.com/\_CHINOSAUR/status/461864317415989248
2. ACM. How to Classify Works Using ACM’s Computing Classification System. 2014. Retrieved August 22, 2014 from [http://www.acm.org/class/how\_to\_use.html](http://www.acm.org/class/how_to_use.html%20)
3. Ronald E. Anderson. 1992. Social impacts of computing: Codes of professional ethics. *Soc Sci Comput Rev* 10, 2: 453-469.
4. Anna Cavender, Shari Trewin, Vicki Hanson. 2014. Accessible Writing Guide. Retrieved August 22, 2014 from <http://www.sigaccess.org/welcome-to-sigaccess/resources/accessible-writing-guide/>
5. Morton L. Heilig. 1962. Sensorama Simulator, U.S. Patent 3,050,870, Filed January 10, 1961, issued August 28, 1962.
6. Jofish Kaye and Paul Dourish. 2014. Special issue on science fiction and ubiquitous computing. *Personal Ubiquitous Comput*. 18, 4 (April 2014), 765-766. <http://dx.doi.org/10.1007/s00779-014-0773-4>
7. Scott R. Klemmer, Michael Thomsen, Ethan Phelps-Goodman, Robert Lee, and James A. Landay. 2002. Where do web sites come from?: capturing and interacting with design history. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '02), 1-8. <http://doi.acm.org/10.1145/503376.503378>
8. Psy. 2012. Gangnam Style. Video. (15 July 2012.). Retrieved August 22, 2014 from <https://www.youtube.com/watch?v=9bZkp7q19f0>
9. Marilyn Schwartz. 1995. *Guidelines for Bias-Free Writing.* Indiana University Press.
10. Ivan E. Sutherland. 1963. *Sketchpad, a Man-Machine Graphical Communication System*. Ph.D Dissertation. Massachusetts Institute of Technology, Cambridge, MA.
11. Langdon Winner. 1999. Do artifacts have politics? In *The Social Shaping of Technology* (2nd. ed.), Donald MacKenzie and Judy Wajcman (eds.). Open University Press, Buckingham, UK, 28-40.