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Infographics: A toolbox for technical writers?

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Over the last few years, visual elements have grown in importance and sophistication in technical writing. According to scientific literature, the inclusion of visual elements in technical documentation has resulted in a greater accessibility. Yet, technical writers tend to use visual elements not only to present numbers and help users to understand the meaning of those numbers, but also to explain a procedure, a concept, a reference, or another topic. The impact of this trend aroused our interest for infographics.

Infographics *is the abbreviation for* information graphics*. This visual representation of information or data is used to convey information, and this information can be presented in a literal or more metaphorical way. As delivering a message in technical writing is not an easy task, implementing infographics in this context is particularly convenient. This article explores the compatibility between technical writing and infographics, and the limits of infographics implementation in technical writing. The difficulties of establishing a unique definition of infographics, and the differences between infographics and data visualization are also discussed in this article.*

Keywords : infographics, technical writers' skills, visual communication, tools

Introduction

The term infographics has become quite popular in the last few years and today it is inevitable to talk about infographics when talking about graphic design or web design. Modern eye tracking research seems to confirm this old proverb saying "a picture is worth a thousand words". That has led companies and public institutions to implement infographics in a wide range of areas. Today it is no longer surprising to find a poster in a social security office explaining through infographics how to carry out an administrative procedure, or even in the hall of an apartment building explaining how to properly sort our garbage. Even the

French Ministry of Home Affairs has recently resorted to infographics to explain how to behave in the case of a terrorist attack.

Yet, as it has happened before with other terms related to the digital era, many people employ this term without being able to provide a clear definition of what infographics are. Establishing a consensual and unambiguous definition for this concept is extremely problematic and since the beginning of our research another term crossed our path and made this question even more complex. The term was data visualization and we found that infographics and data visualization were used interchangeably very often.

It seemed complex to obtain a unique definition from technical writers because we rapidly understood that for some professionals a mere screenshot used to illustrate a procedure could be considered an infographics. But it was crucial for us to draw a distinction between infographics and data visualization and to define precisely the limits of our research field.

Scientific literature enabled us to understand that even if infographics and data visualization were both tools used to visually represent data, the difference between them resides in their purpose. While data visualization is intended to simplify a highly quantised information, the goal of infographics goes beyond the visual presentation of information. In other words, infographics' goal is to convey a message, to tell a story (Hart, 2013).

This is the reason why infographics can be a very valuable tool for technical writers, but what are the limitations of infographics? We decided to explore the compatibility of infographics and technical writing, and the limits of infographics implementation in technical writing. Our first hypothesis was that both of them were complementary. We thought that this complementarity made the implementation of infographics in technical writing interesting, but at the same time this implementation presented serious limitations.

Advantages and inconveniences of infographics

Numerous studies show that humans are visually wired. For instance, Richard E. Mayer conducted a research in 1996 which presented compelling evidence for the value of summary visuals through a number of experiments (Mayer *et al.*, 1996). This research shows that if scientists want learners to be able to explain a system and solve problems, but most of all memorize them, they should avoid providing lengthy textual content, because they are not as effective as multimedia summaries that combine both visual and textual formats. Furthermore, it also proves that a summary with visual elements and a small amount of text is more effective than a summary with visuals and a large amount of text. How can one justify this result? Why are visual representations major assets in terms of technical communication?

The major advantage of infographics is the synthesis of information. Infographics are designed to visually represent complex information, data or concepts in a synthetic and clearer way. They are as a consequence winning cards in technical writing, enabling the reader to process complex data. Providing visual context ensures a greater readability and comprehension of documentation.

Another study conducted by the Faculty of Pharmacy in South Africa found that when it comes to comprehension rates of medicine labels, 70% of the people surveyed understood labels with text only, whereas 95% understood labels with text and images (Dowse and Ehlers, 2005). People following directions with text and illustrations do 323% better than people following directions without illustrations (Levie and Lentz, 1982). This represents a fairly big advantage for infographics over plain textual content.

However, text is still needed. In fact, not every human being is comfortable with mere graphical representation. Certain users are more comfortable with text *and* visual elements. Infographics ensure a better understanding for both audiences, because they combine both visual and textual elements, making them therefore more accessible.

In addition, infographics are more engaging. In fact, with 70% of all sensory receptors in our eyes and almost 50% of our brain involved in visual processing, documentation including colored visual elements increase the willingness to read by 80% (Green, 1989).

Another benefit of infographics resides in visual storytelling. Infographics are indeed easier to recall than pages of text alone.

Given that human beings remember about 80% of what they see and do, and 20% of what they read, the combination of both text and visual elements is mnemonic (Lester, 2006).

Furthermore, infographics attenuate language barriers, and therefore attract and inform a larger audience. As a matter of fact, colored visual information is prone to be understood more widely. For instance, the European Commission and the United States Department of Transportation identify the Pantone colors for its traffic signs, reserving red, yellow and orange for the most important cautionary signs (Barringer, 2009). These well thought-out colors are instinctive evocations of danger and the need for carefulness. Technical writers can then use these colors to convey an impression of danger almost instantly.

Nevertheless, technical writers must be pragmatic when discussing the implementation of infographics in technical documentation. Indeed, the use of infographics can present inconveniences.

Creating infographics requires firm aptitudes in graphic visualization, which is not the core skill of a technical writer. When writing, for instance, a manual with mainly text, the core objective of the technical writer is to transmit synthesized information essential to the reader in a clear way and with a restricted amount of data. When creating effective infographics, the

writer must filter and synthesize the information once more, establish relationships, discern patterns and represent them in a simple way that allows the consumer of that information to process and digest meaningful knowledge.

The best way to achieve that simplicity is through design choices and the intelligent reduction of elements that distract from the message, skills that are not inherent to technical writers. The lack of mastery may result in erroneous design choices and therefore in information loss, which leads to the publication of an incomplete and incoherent documentation. As stated by Francesco Franchi, editorial and visual information designer, “The intrinsic value of the message must never be lost” (Franchi, 2010).

Nonetheless, despite the difficulties, the writer must not lose sight of the fact that the primary role of infographics is to help the users access the data, and only then, surprise them with the fluency and the creativity of the information graphic.

Best practices

Such limits raise the following question: what are the criteria for effective infographics? Technical writers need to identify these criteria to better convey their message. Infographics creation follows the same process as technical documentation, considering that professionals take into account three main elements: the audience, the message itself and the way it is delivered.

A primary requirement is to plan the infographics by defining the audience (Hart, 2013). The level of expertise, qualification and requirements of the audience help conceive infographics, as well as technical documentation. By defining personas, i.e. fictional users that are created according to a user research, technical writers better understand their target audience and define their perspectives. They can thus design and create more appropriate infographics, including a visual vocabulary that the audience will easily understand and recognize instantly. For instance, experts and broad public from various countries do not have the same visual vocabulary, and thus the same experience with technical documentation.

The audience partly defines the purpose of technical documentation. Purposeful infographics are more meaningful to users. Technical writers guide users through their documentation to perform tasks or to understand concepts and references, hence the need to know where to lead them before designing and creating infographics. Defining and selecting the information to convey according to the audience’s requirements is necessary before the creation and design process as it ensures that the infographics are based on the main ideas and thus, deliver the message in an effective way. An XML data model for example defines a primary objective and structure for each topic: the Darwin Information

Typing Architecture. It includes three topic types: the concept topic refers to objective information such as definitions or rules, whereas the task topic describes the procedure for a task through various steps and the reference topic gathers reference material that could be useful for users. Technical writers can base infographics on these topic types to have a clear objective and convey information in a more efficient way.

However, technical writers deal with a substantial problem: how can they efficiently communicate complex information without making it too simple? This problem is at the core of technical communication since the amount of data is usually substantial and one of the key requirements is the KISS principle (Keep It Short and Simple), i.e. getting rid of the unnecessary details to keep the essential information and optimize the understanding in a concise manner. Besides, technical communication is defined as “the discipline of transforming complex information into usable content for products, processes, and services” (Bleil, 2013). Technical writer Tom Johnson questions this definition and explores several solutions (Johnson, 2014). In his opinion, the word “usable” is more appropriate than “simple”, and so is “content” rather than “information”. This terminology distinction underlines the need for technical writers not to undermine the complexity of the products that they are documenting despite marketing strategies for technology products that promotes them as easy-to-use products. They should keep in mind that the tool is not the message. Tom Johnson advises his counterparts to take simplicity out of complexity from information and then, to deliver it gradually without removing information by using tools, such as infographics. Richard Mayer’s research (Mayer *et al.*, 1996) underlines the benefit of presenting information by combining visual and textual elements since too many words get in the way of users’ comprehension.

Infographics are appropriate media for such purpose under specific conditions. Firstly, color infographics are more effective than black and white ones. Colors are key elements for visual media as it partly drives users’ attention: humans are more sensitive to chromatic variations than light changes, they focus more on contrasts than on light when they see images (Vazquez *et al.*, 2010). Many researchers sustained this hypothesis, hence the broad agreement on the impacts of colors on humans’ attention. For instance, Mike Brennan and Jan Charbonneau conducted a research and analyzed the various solutions to increase the response rates of surveys, namely the effects of colors in questionnaires: they came to the conclusion that colors were incentives to answer questionnaires and that using purple in mail surveys increased the response rates (Brennan and Charbonneau, 2005).

Colors also enhance memory performance and influence users’ retention. Researcher Dae-Young Kim assessed the strategy used by marketers and advertisers to attract consumers’ attention in the tourism and hospitality sectors: her conclusion establishes a correlation between colors and memory (Dae-Young, 2010). Color pictures generate more working memory and remain more significantly in the long-term memory.

Survey result

The benefits of infographics, as we saw, are varied. However, to dive deeper into the reality of infographics and technical writers, we needed to understand what infographics meant inside companies. Consequently, we designed a survey. It took place between May, 9th and May, 20th 2016 and targeted primarily technical writers in our surroundings (our workplaces) and our social circles (other students and their circles as well). The survey consisted of nine questions. Each gave us information about what the combination of infographics and technical writing meant in various companies. 22 persons took the survey. Almost one half of this population (45%[1], 10[2] people out of 22) worked in software, or IT companies. The rest is more widely spread between aeronautics, e-learning, defense, human resources and other sectors.

One of our first results was that 86.4% of the surveyed population declared that they use infographics. This result however needs to be qualified. As we saw, the definition of infographics is, in itself, a problem. We had the impression that the absence of unanimity around the concept of infographics raises a problem even for specialists and that was despite the fact that we provided a definition.

Almost two thirds of the people who took the survey (64%) answered that they do not work with one or a team of graphic designers. This means that almost two thirds of the time, technical writers are the ones to create them. This first important result confirms one of our starting hypotheses. With the economic situation being difficult, companies tend to be less willing to spend money. They are more reluctant to hire a graphic designer. Instead, companies tend to rely on technical writers to create visual contents. The consequence for technical writers is that their graphical skills become an appreciable bonus on job markets.

Indeed, companies seem to value greatly the skills of their technical writers. The website salary.com gives us an average technical writer salary which is almost twice as much as that of a graphic designer. This could be explained by the fact that technical writers are rarer than graphic designers on the job market. However, another explanation could be considered. It might be possible that technical writers are now expected to have graphic skills.

Another fact to take into account is the importance of visual communication in technical documents. If companies, users and people in general tended to disregard visuals, the over-representation of technical writers over graphic designers would be very understandable. It is however not the case, as studies reveal (Richard Mayer, op. cit.). Human beings rely heavily on visual communication. Our survey also demonstrates this fact. Almost half of the professionals surveyed (45%, 10 persons out of 22) consider infographics

[1] Percentages are rounded.

[2] For convenience purposes, alongside the percentages, we also provide the actual number of professionals who actually chose the mentioned entry.

to be very important. 27% (6) think it is important enough. However, there are another 27% who consider it to be of lesser importance. None at all answered that it is completely unimportant.

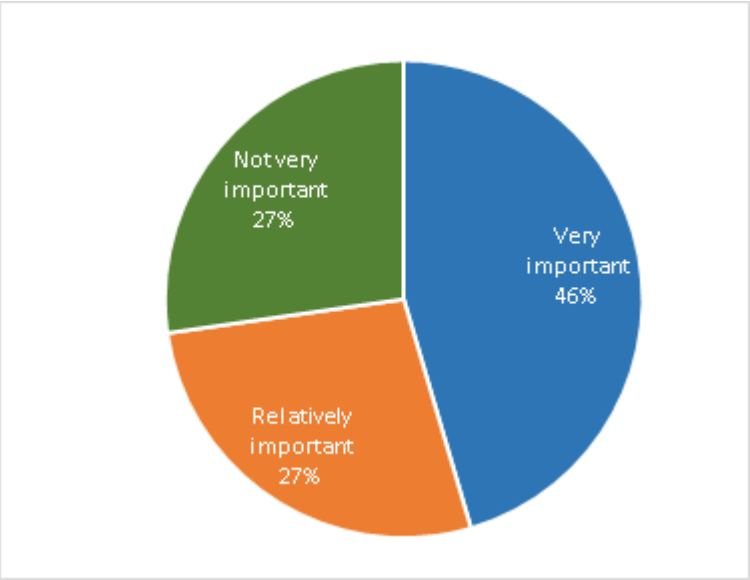

Fig. 1 Diagram representing the percentages of technical writers and the importance of infographics

Besides, even though we discovered that visuals are considered at least relatively important or extremely important for almost 73% of professionals of technical communication, we have unearthed another disturbing discrepancy. However important they think infographics are, the number of professionals who think they are very competent when dealing with infographics is very limited. Actually, we found out that this number is only 5%. In terms of individual results, this means that there is only one person of our surveyed population that feels very competent when dealing with images and infographics.

The remainder of the answers regarding the level of competence in infographics is then more evenly spread. 52% of the people who took our survey (11 out of 22) think they are competent enough in that regard. 42% of our surveyed population (and who are doing infographics as part of their profession) do not feel at ease or feel they really lack skills in infographics. Out of that number, 9.5% (i.e 2 persons) think they do not have the necessary skills.

Concerning the question that we designed about the role of infographics, professionals were left free to tick more than one answer. Indeed, we believed that it was possible that infographics could have more than one purpose for technical writers and graphic designers. We pinpointed three different possible entries for technical writers to choose between. Infographics could fulfill a decorative, a demonstrative, or an explanatory purpose. The first one (the decorative purpose) would indicate that the intention of the author

was to embellish their documents. The second and third options to choose between (demonstrative purpose and explanatory purpose) might seem similar at first glance. However, they are not. The distinction lies in the fact that one can show a procedure without revealing the concepts or the mechanics behind the user's actions, and this, for the sake of simplification. This corresponds to the demonstrative purpose. On the other hand, it is also very understandable that a technical writer would want the user to be perfectly aware of how everything works before the user attempts a given procedure which may be harmful or dangerous. This is what we meant by explanatory intention.

The results that we can now reveal and which came as a surprise to us, demonstrate that for the vast majority of communication professionals who took our survey, infographics are a way to give explanations (for 77% of them (17)). The demonstrative purpose also ranked very high: nine professionals (45%) chose to select this answer. 14% (3 persons) of our surveyed population chose to answer that infographics fulfilled a decorative purpose.

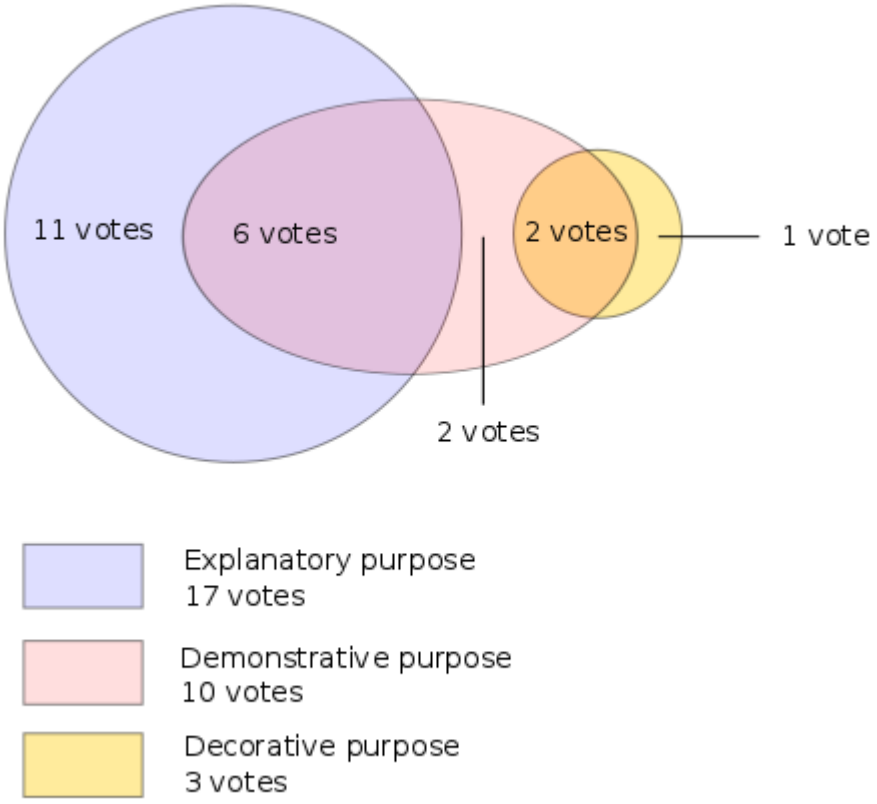

Fig. 2 Diagram illustrating the answers concerning the purposes of infographic elements

If we perform a deeper analysis of those results, it appears that, out of the 17 technical writers who consider that they use infographics for explanatory purposes, 11 chose

explanatory as their sole answer whereas all 6 others added demonstrative only. Furthermore, and surprisingly enough, one professional declares using infographics for decorative purposes only. Nobody chose to tick all three.

	Decorative purpose	Demonstrative purpose	Explanatory purpose	Percentage
Decorative purpose	1	2	0	13,63
Demonstrative purpose	2	2	6	45,45
Explanatory purpose	0	6	11	77,27
Percentage	13,63	45,45	77,27	

Fig. 3 Detailed answers to: In your opinion, what is the most important characteristic of a good infographic element?

The next and final result of our survey concerned the reasons why infographics are considered important by professionals. This question was designed with a choice between three options. Technical writers could choose between the simplicity for the user to understand and the attractiveness. The last option consisted in a text field for people to fill.

The results show that a massive majority of professionals (86%, i.e 19 persons) choose to include infographics in their document because it facilitates the user's understanding. 4.5% (1 professional) use infographics because they are eye-catching. 4.5% use them for both reasons. The last 4.5% think that infographics are easier for the users to reproduce.

Discussion

From our survey and the analysis of the state of the art, we came to the conclusion that infographics has become an important tool for technical writers. Despite our initial hypothesis we observed that most technical writers already use infographics in their documentation, and what is even more significant is that they consider that infographics plays a paramount role in technical documentation. Even if we noticed an incontestable ambiguity around the term, we can clearly state that visual elements play a crucial role in technical documentation.

Another unexpected conclusion was the fact that infographic skills are no longer the exclusive prerogative of graphic designers. As we saw, the economic situation and the new configuration of the business world makes almost impossible for technical writers to have at their disposal a team of graphic designers. This results in technical writers needing to acquire graphical skills to be competitive and to produce attractive documentation.

However, our findings should be qualified in several ways. First, we had limited time to conduct our survey, and even if we think that the sample of technical writers surveyed provided us with a global perspective of this profession, more detailed results could be obtained with a broader survey.

Second, we observed an over-representation of the professionals working in the software industry among the professionals who took the survey. Probably because this sector is one of the largest employers of technical writers. But we must consider the fact that the reality of other sectors can differ and our study could be enriched with the representation of all sectors employing technical writers.

Moreover, we have questioned technical writers about their graphic skills and it would also be extremely enriching to study the other side of the coin: asking graphic designers what they think about the use of infographics in technical writing.

Another question raised during our research was that of the standardization. Could we contemplate the idea of a universal dictionary of infographics in technical communication? Further research may also focus on how to standardize infographics.

But, as already mentioned, the importance of infographics in technical communication is an undeniable fact. The combination of text and visual elements has proved to be the most effective way to help people to understand complex information and to memorize key points. Moreover infographics attenuate language barriers, making information more accessible.

Accessibility is the key concept when discussing infographics, but is also the key concept when it comes to technical documentation. As it happens with infographics, the role of technical documentation is not to simplify complex information but to help users to access it. The same analytical and synthesis skills that are at the core of technical writing, are also crucial to create infographics. Technical writers may not be proficient designers but they know how to sort information to create valuable content for users, and this is exactly what infographics pursue.

References

Barringer, D. (2009). *There's Nothing Funny About Design*. New York: Princetown Architectural Press.

Bleiel, N. (2014). President's Midterm Report. *Society for Technical Communication*. http://notebook.stc.org/presidents-midterm-report/ (Consulted June 27, 2016).

Brennan, M. & Charbonneau, J. (2005). The Colour Purple: The Effect of Questionnaire Colour on Mail Survey Response Rates. *The Marketing Bulletin*, 16.

Dae-Young (2010). The Interactive Effects of Colors on Visual Attention and Working Memory: In Case of Images of Tourist Attractions. *International CHRIE Conference-Refereed Track*. University of Massachusetts.

Dowse, R. and Ehlers, M. (2005). Medicine labels incorporating pictograms: do they influence understanding and adherence? *Patient Education and Counseling*, 58 (1), 63-70.

Franchi, F. (2010). *The Limits of Infographics*. http://www.francescofranchi.com/the-limits-of-infographics (Consulted June 27, 2016).

Green, R. (1989). The Persuasive Properties of Color. *Marketing Communications*.

Hart, G. (2013). Effective Infographics: Telling Stories in the Technical Communication Context. http://techwhirl.com/effective-infographics-telling-stories-in-the-technical-communication-context/ (Consulted June 27, 2016).

Johnson, T. (2014). An Argument for Complexity Rather than Simplicity in Technical Communication. http://idratherbewriting.com/2014/02/07/an-argument-for-complexity-rather-than-simplicity-in-technical-communication/ (Consulted June 27, 2016).

Lester, P.M. (2006). *Syntactic Theory of Visual Communication*. California: Department of California State University.

Levie, W.H. & Lentz, R. (1982). Effects of text illustrations : A review of research. *Educational Technology Research & Development*, 30 (4), 195-232.

Mayer, R.E. *et al.* (1996). When Less Is More: Meaningful Learning From Visual and Verbal Summaries of Science Textbook Lessons. *Journal of Educational Psychology*, 88 (1), 64-73.

Vazquez, E. *et al.* (2010). Saliency of color image derivatives: a comparison between computational models and human perception. *Journal of the Optical Society*, 27 (3), 613-621.

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Afterwards, he became interested in another form of transmission and communication, that is technical communication. That's how he became a technical writer.

Manoela SANTIDRIAN is a technical writer born and raised in Spain. She has been living in France for six years and she obtained her master's degree in technical writing at French university Paris Diderot. After a very enriching professional experience in the study abroad field, she started her career as technical writer at the Pedagogical Engineering Department of Paris Dauphine University. This experience was followed by an apprenticeship at Planisware, a global provider of Project Portfolio Management software. Manoela enjoys discovering new technologies and taking part in innovative projects. Fond of cinema, she loves reading and travelling to discover new realities and cultures.