

Technical innovation: what impact on quality in technical writing?

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Nowadays, innovation is considered as a race for companies. Companies need to win this race in order to stay ahead of the game. In this frantic pursuit of innovation, it is important to keep in mind that innovation for innovation's sake is pointless. To bring value to companies, innovation must lead to quality improvement and cost reduction. Like any other profession, technical writers are compelled to innovate in order to stay relevant. The most obvious expression of innovation lies in the introduction of new tools in the documentation process.

This article explores the impact of technical innovation on the documentation process and product. To be valuable, technical innovation needs to enhance the quality of the process or the product. This article aims at answering the following question: to what extent does technical innovation impact the quality of the documentation process and product? To a lesser extent, we also analyze the role of innovation-driven companies in fostering innovation for technical writers.

In addition to reading articles on innovation, quality and the relationship between the two, we also carried out a survey aimed at technical writers. From the results, we found out that while technical innovation improves both the documentation process and product, the most significant impact may actually come from rethinking information flows and team organization.

Keywords : company culture, documentation process, documentation product, innovation, new media, quality, technical innovation, technical writer, technical writing, technical writing tools

Introduction

In our fast paced, technology-driven, consumer society, companies must innovate in order to keep up with the market. At various levels, innovation finds its way into every sector of a company. Innovation can take different forms: product or service innovation, process innovation and marketing innovation. Regardless of the type, innovation, at its core, simply means the introduction of a new idea, device or method.

However, nowadays, the word “innovation” implies the idea of a positive change. Indeed, the main motives behind innovation are quality improvement and cost reduction. An innovation which does not meet these two criteria is considered as pointless. Therefore, there is a close relationship between innovation and quality.

Over the last decades, technical innovation has also transformed the face of technical writing. In technical writing, innovation has operated at two different levels: the documentation process and the final documentation. Innovation in the documentation process has led to a profound change in the skill set required from technical writers. Change in the process has also brought a wide range of new media for documentation: online help, video tutorials, infographics, and so on.

We chose to gather and analyze experiences, impressions and opinions related to innovation from technical writers to measure the impact of innovation in the world of technical writing. Through a survey, we raised the question about the improved quality of the documentation process and product. The results of the survey have enabled us to investigate the effects of innovation on the work quality for the technical writer and the improvements in the documentation for the user. Even though innovation happens equally at the process and product levels, its impact could be significantly different in terms of quality. In the end, we will discuss the role of the company in the innovation process. Generally speaking, companies encourage innovation because innovation creates a sustainable competitive advantage by improving the quality of their products. An innovation-driven company could be more favourable for technical writers to develop and thrive.

Literature review

As there is little research on the subject of innovation and quality specifically applied to technical writing, we had to broaden the scope of our research to more generic concepts. Once we were familiar with these generic concepts, we were able to frame and apply them in the context of technical writing.

What is innovation?

In recent years, the term “innovation” has been used and overused by companies so much so that it has often become a mere buzzword, leaving much space for interpretation. Innovation is defined as the introduction of a new or significantly improved product (good or service), process or method (Popescu et al., 2016). There are different types of innovation such as product/service innovation, technical innovation, marketing innovation and organizational innovation (Waqas et al., 2014). For our research, we chose to focus on technical innovation which refers to “changes in techniques, equipment and/or software” (Waqas et al., 2014). The aim of technical innovation is to decrease costs of production, increase quality and produce new or significantly improved products (Waqas et al., 2014). Therefore, innovation is only valuable if it increases the quality of the process or the product.

In technical writing, technical innovation can be a change in technical writing tools: from content authoring software (MS Word) to XML/DITA software (Oxygen XML) for example. Historical research (Brockmann, 1998) or assessment of the profession nowadays, enabling a glimpse of its future (Gallon, 2016), show that technical innovation may impact both the documentation process and the final documentation by changing the content, the way content is managed or the medium. Exploring the actual impact of a new tool on the work of technical writers is crucial as specific technical skills are increasingly in demand by employers (Lanier, 2009).

What is quality?

According to ISO 8402-1986 standard, quality is defined as “the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs.” In other words, a product or process is of quality when it meets a specific set of needs, expectations and requirements. The more criteria a product or process meets, the more high-quality the product or process is likely to be. At the process level, the quality is expressed in “delivery time reduction, higher productivity, staff effectiveness in product development” (Morejón, 2014). At the product level, the quality is expressed in “the increase of the value perceived by customers, reducing costs, stability in the new designs, a higher return on investment on new products, and improved product performance” (Morejón, 2014).

Technical writing is successful when “the writer’s intentions, the writer’s text, and the reader’s expectations” match (Barabas, 1990). Unfortunately, there is a lack of empirical studies on how quality results in technical documentation. Some international technical documentation standards, such as the S1000D XML specification and the ASD-STE100 Simplified Technical

English specification, do exist but they are relevant only to a certain kind of documentation and are not use in all industries and companies.

Nevertheless, these standards underline a range of criteria that should be met by technical documentation : compliance, consistency, readability, efficiency, volume reduction and cost savings. A documentation is considered of high quality when it is accurate, up-to-date and suits users' needs and purpose. The quality in the documentation process can be expressed through an efficient and flexible documentation process.

What is the relationship between innovation and quality?

According to the 2015 edition of ISO 9001, innovation is one of the most effective ways to improve quality. Indeed, innovation is only valuable to companies if it brings improvements in the quality of a company's service or product (Waqas et al., 2014). Therefore, the improvements in quality can be considered the main criteria to evaluate the effectiveness of an innovation. Ideally, there should be a cause and effect relationship between innovation and quality where innovation is the cause and quality, the effect.

Is that the case in technical writing? Does the introduction of new tools actually enhance the quality of the documentation process and product? Does it have a more important impact on one process or the other or the same impact on both? These are the questions we wanted to answer through our research.

Company culture and innovation

Companies invest in innovation because it is a way for them to "create a competitive advantage by surprising competitors with modifications to existing products or by the introduction of new products" (Flynn, 1994). By enhancing the quality of companies' services or products, innovation enables companies to stay ahead of the curve. Therefore, companies play a paramount role in fostering an innovative environment. Companies can create an innovation-driven workplace through the recruitment and the organization of events related to innovation. Indeed, management commitment is considered "an absolute prerequisite for the success of both quality and innovation." (Vachhrajani, 2008). Companies need to hire managers who are able to stimulate and support innovative ideas from employees. Companies also need to invest in events such as conferences, trainings and workshops as they often inspire employees to come up with their own creative and innovative ideas.

According to BusinessDictionary, a company's culture encompasses the values, practices, norms, and beliefs to be shared by the company's leadership and employees. But in many companies, "the tech writer role is ill-defined at best and largely misunderstood at worst" (Mahoney, 2016). In this difficult position, do technical writers benefit from an innovation-driven company culture as well as any other employee? Is it profitable to innovation in their specific work?

Methods

As there is little literature about the link between innovation and quality in the field of technical writing, we decided to carry out a survey to collect data on this subject from our fellow technical writers.

We designed the survey to verify or deny the following hypotheses:

- Technical innovation (introducing a new tool) improves quality in technical writing.
- Technical innovation (introducing a new tool) has a more positive impact on the documentation process than on the final product.
- An innovation-driven company culture enables technical writers to improve the quality of their work.

We decided to ask for both quantitative and qualitative answers to allow a finer analysis. The survey is built around three axes:

- Who the person is as a technical writer (age, experience, job title, company)
- Feedback on a change in their technical writing tools or reflections/thoughts/insights on the need for a change in their technical writing tools (tools, reasons, outcomes)
- Information on their company culture (events, training)

The survey was written in English since our article is in English and English is the language of international technical writing. We used Google Forms to design the survey and sent a link to it by email.

In order to get as many results as possible, we sent the survey to a wide range of technical writers: our colleagues, our fellow students, our teachers, former students and technical writers we met during a conference. We asked them to send it to their colleagues as well. The survey was also posted on the Swiss Society for Technical Writing web site (tecom.ch).

We opened the survey on May 2nd 2017 and closed it to analyze the results on June 2nd 2017.

Results

Respondents

The sample includes a total of 37 respondents. Approximately half of the respondents (48.6%) are under 35 years old. The other half is divided between people between 36 and 50 years old (24.3%) and people over 50 (27%). Overall, the respondents tend to be young. From the sample, we can assume that technical writing is a dynamic field that attracts young people.

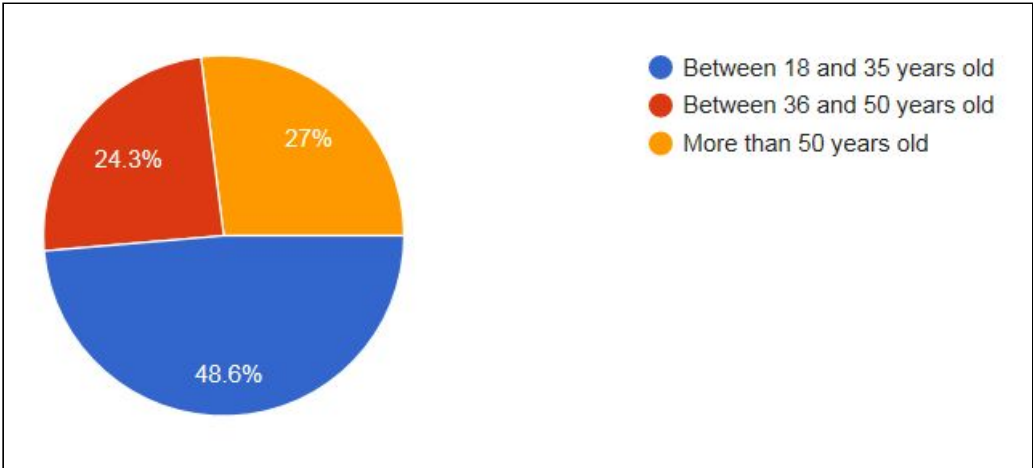


Figure 1: Age distribution (37 respondents)

More than half of the respondents have a significant work experience (more than five years) as technical writer. Most of them work in a major software company such as SAP, Atos or IBM.

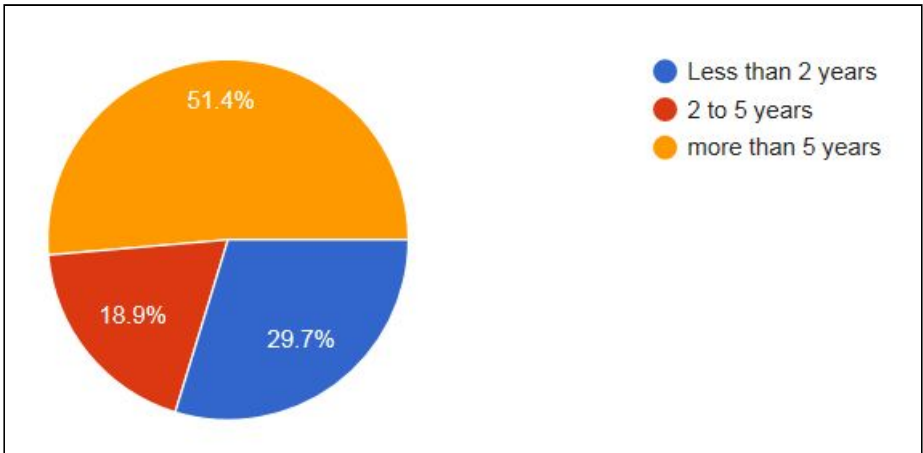


Figure 2: Job tenure (37 respondents)

As for the documentation, they produce equally online and paper based documentation. A third of respondents also produce videos, which might be a sign of the emergence of video as a support for technical documentation.

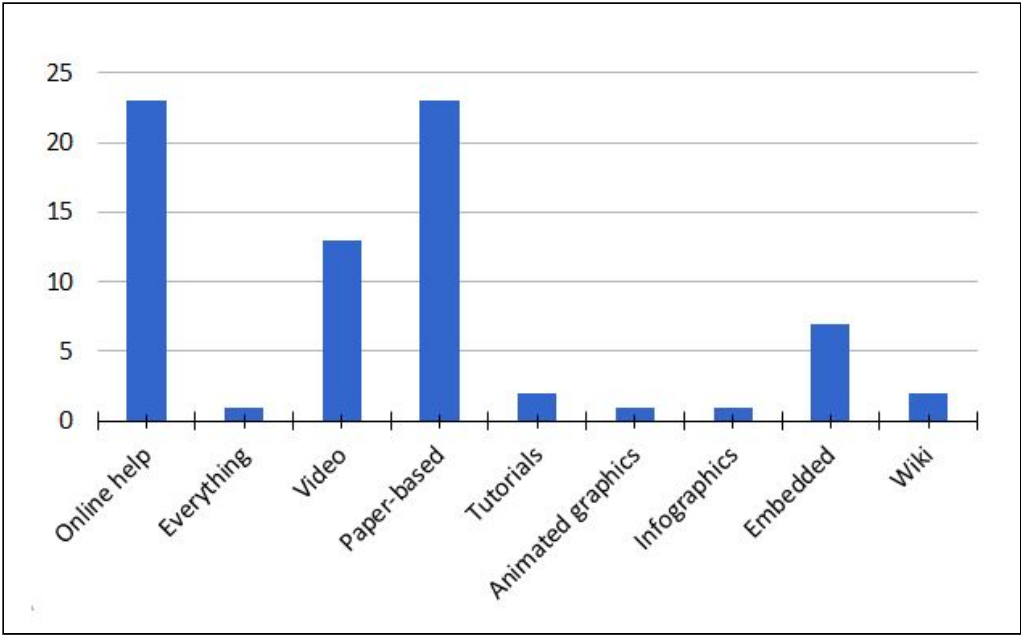


Figure 3: Types of documentation (37 respondents, open question)

Impact of technical innovation

Since innovation implies the idea of a new positive change, we focused our survey on technical innovation and its impacts on the documentation process and product.

Less than half of the respondents (48.6%) have gone through a change in their technical writing tools. Among those respondents, a majority (66%) have job tenure of 5 years or more. There seems to be a correlation between the job tenure and a change in technical writing tools. The respondents with the longest job tenure are more likely than others to have gone through a change in their technical writing tools. From these results, we can assume that it takes at least five years for the need for a change to rise, to convince that a change is needed, gather the necessary resources and implement the change. If half of the respondents did not have to change their documentation process over the last five years or so, it could also mean that there wasn't any innovation so groundbreaking that it compelled technical writers to make a change. The lack of innovation in the technical writing field could reflect companies' reluctance to invest in less flourishing but valuable departments such as the documentation department.

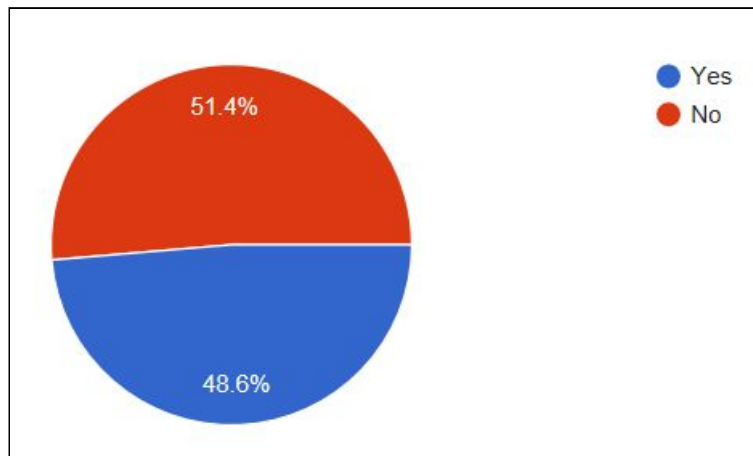


Figure 4: Have you gone through a change in your TW tools? (37 respondents)

To understand the motives and consequences behind technical innovation in the technical writing field, we need to closely analyze the change:

- The types of change in technical writing tools
- The trigger factor for the change
- The reasons used to justify the change
- The impacts of the change

The types of change in technical writing tools

Out of the 18 respondents who have gone through a change in their technical writing tools, two answered unclearly. Those answers are therefore not used in the following analysis.

From the 16 usable answers, we identify the following types of changes in technical writing tools:

- From a content authoring software to a team collaboration software (3 answers). For example: from Madcap Flare to Confluence, from MS Word to Sphinx.
- From a content authoring software to an XML/DITA software (6 answers). For example: from MS Word to Oxygen XML, from Adobe FrameMaker to Ixiasoft.
- From a content authoring software to MS Word (4 answers). For example: from Adobe FrameMaker to MS Word, from Autodesk Inventor Publisher to MS Word.
- From the same kind of software to a more powerful one (2 answers). For example: from Arbortext Advanced Print Publisher to Oxygen XML, from MS Word to MadCap Flare.
- From one tool to another, depending on the client (1 answer).

The trigger factor for the change

In most cases (72.2%), the change initiative arose from management. Since management is clearly a driving force for innovation, companies should keep on investing resources in manager selection and training. However since more than a quarter of the changes originating from a fellow technical writer (27.8%), companies must also remain alert to individual initiative.

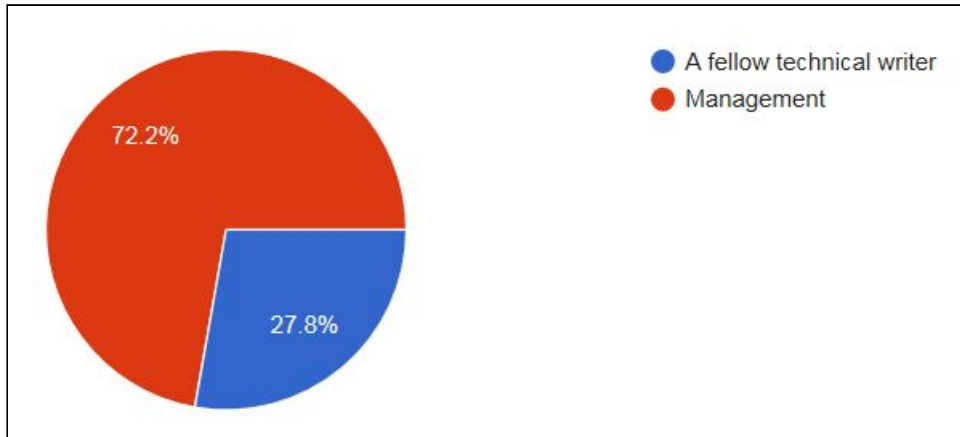


Figure 5: From where did the idea of change come from? (18 respondents)

The reasons used to justify the change

In every case, the main goal of the change was to enhance the documentation process. Improving the final documentation came second and aligning with the competition came last.

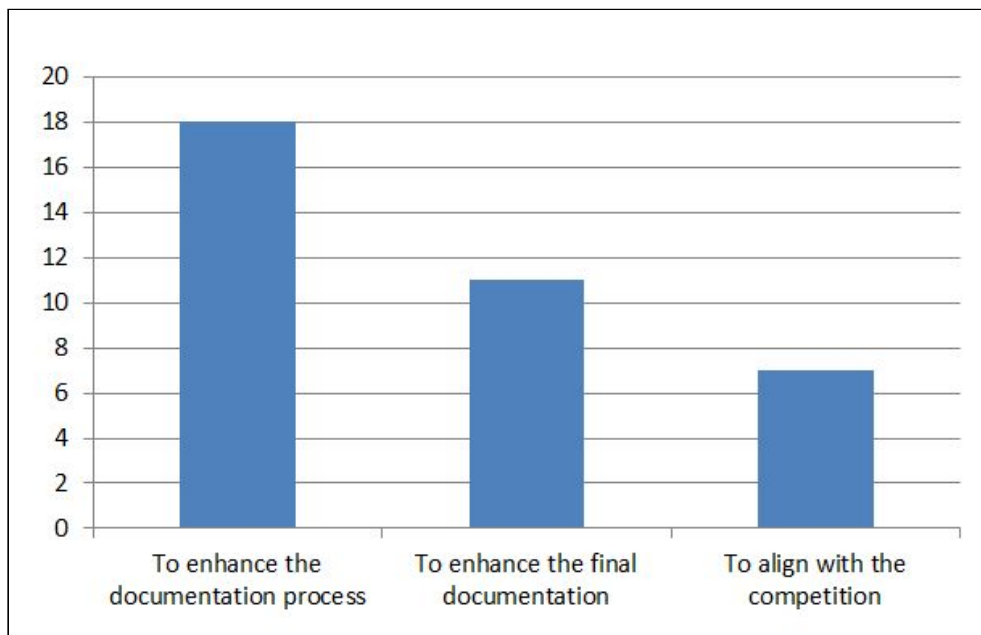


Figure 6: What were the reasons used to justify the change? (18 respondents, multiple answers possible)

Some respondents provide more details as to the aspects of the documentation process they wished to enhance with the change:

- A significant number of them (4 answers) wanted to make their documentation process more collaborative: anyone, writer or developer, would be able to contribute to the documentation in an easy and efficient way. A software designed to be collaborative (ex: Confluence) or a well-known software (ex: MS Word) was therefore chosen.

- Several respondents (3 answers) wanted to get the documentation process more flexible so that the documentation could be easily customized, interfaced with other tools or devices and published in multiple formats and large number.
- Some respondents (2 answers) believed that the software they were using was inappropriate either because it was not documentation dedicated or because it was obsolete. A documentation dedicated software was therefore chosen (ex: XMetal or Madcap Flare).
- One respondent expressed the wish to produce state of the art documentation that would better fit customer's needs.

Through these answers, we began to suspect that improving the documentation process allows to improve the final documentation. Both are inherently connected.

Though apparently not the primary concern, financial aspects of the change were not overlooked:

- One respondent explained that a ROI analysis was conducted before the transition.
- One respondent explained that, among other advantages, the new tool was cheaper.

The impacts of the change

A vast majority of the respondents (88.9%) estimates that changing their technical writing tools actually improved their documentation process. But most of them (72.2%) reckon it also improved the final documentation, thus confirming our suspicion that enhancing the documentation process usually affects positively the final documentation.

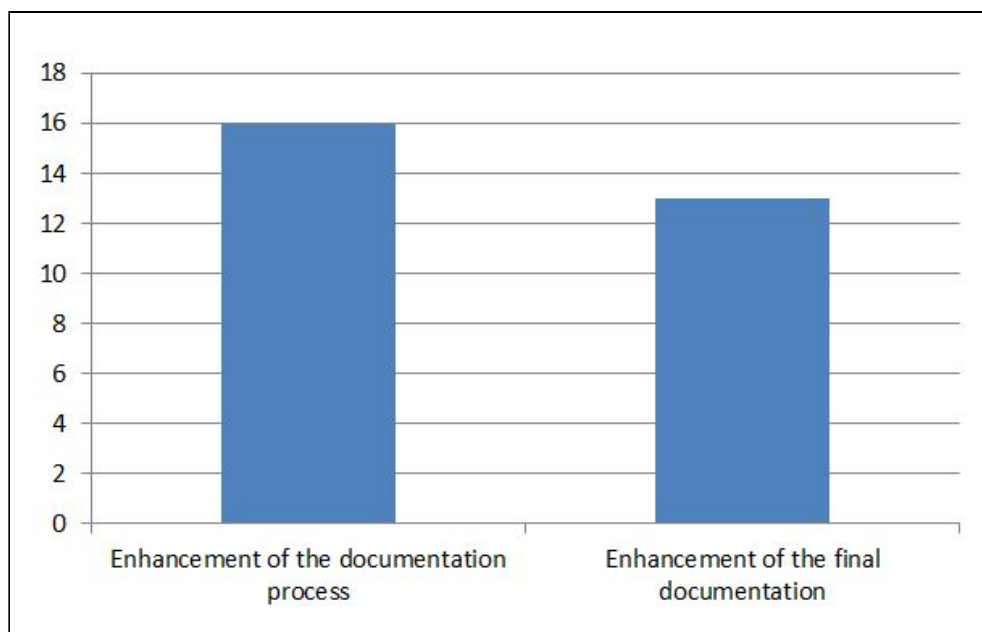


Figure 7: What was the actual impact of the change? (18 respondents, multiple answers possible)

More precisely, the respondents indicate three main effects induced by the change:

- The documentation process became more collaborative and integrated into product development: with better access to the documentation, developers and SMEs were

able to easily edit or comment on it. As a consequence, they became more involved in the documentation process and went on to consider documentation as one of the features of the product rather than a separate deliverable. (4 answers)

- Production time was reduced thanks to the enhancement of the documentation process. Less time was wasted on formatting and finalizing, allowing more time to the writing and updating process. (3 answers)
- The documentation process was fully integrated to the internal workflow. (1 answer)
- One respondent is still in the process of this change and two other answers are unclear.

The majority of the respondents (83%) declared that the change was worthwhile. However, one respondent chose not to answer the question, one is still in the transition process and only one mentioned any negative aspects of the change.

Even though they deemed the change worthwhile, the satisfied technical writers also insisted on the fact that the transition was not easy and did not go without issues. The new tool usually solved problems but also created new ones. Some new tools proved complex to install so training was required. Moreover the produced documentation was different and writers had to adapt. Several respondents therefore warned that migrating from one tool to another required having enough resources and careful planning. Faced with the issues generated by their new tools, some respondents came to realize that they are engaged in a never-ending process of solving/creating new problems.

After analyzing the motives and consequences behind technical innovation in the technical writing field, we analyze the reasons why some respondents did not go through a change.

Among the respondents who have not gone through a change, more than half of them (52.6%) think that a change is not necessary. While innovation is seeping into every sector, technical writers are remarkably divided on the question of innovation in their tools.

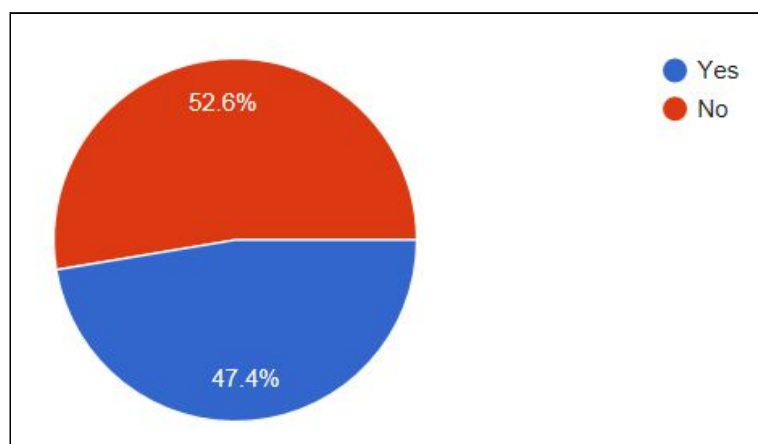


Figure 8: Do you think a change in your TW tools is needed? (19 respondents)

For those who think that a change is necessary, they want to improve equally both experiences: the experience of producing documentation and the user experience. Indeed,

the introduction of new tools could make the publication process much faster and easier. According to them, innovation is a way to gain time so they can focus on making an even better experience for users. Innovation itself does not produce better documentation but it does save time for technical writers to think of ideas, try new solutions and promote their work. A minority of them are in favor of a change to stay competitive in the market. For them, innovation is therefore a way to stay relevant in the technical writing field. Innovation means that they could leverage the newest technologies available in the service of documentation.

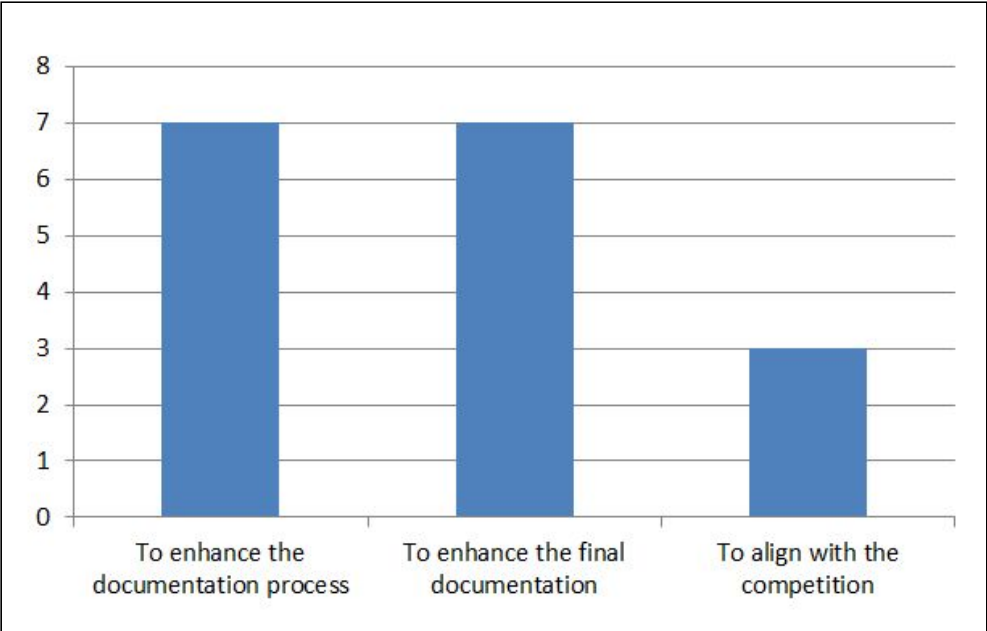


Figure 9: Why do you think a change is necessary? (9 respondents, multiple answers possible)

For those who don't feel the need to change technical writing tools, they put more emphasis on the content than on the form. Good documentation relies on good writing and not on the medium. The tools only need to be sufficient to allow them to do their work. They don't see the point of changing tools that perfectly meet their needs.

Company culture

We first posited that an innovation-driven company can help foster innovation in technical writing department. This is why we analyze the environment in which the respondents are working.

Despite the fact that more than half of the respondents (51.4%) have not gone through a change in their technical writing tools over the last five years, a great majority of the respondents (86.5%) think they work for an innovation-driven company.

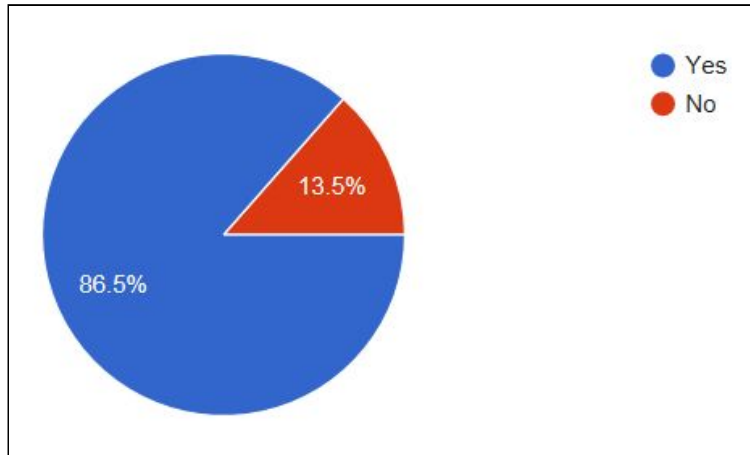


Figure 10: Do you think you work for an innovation-driven company? (37 respondents)

However, according to the respondents, only 59.5% of their companies organize events related to innovation which helps employees to foster new ideas. These events are usually meetups, client feedback conferences, cloud conferences, innovation days, workshops and seminars. As all but one of the respondents working for such companies declared that they believe these events actually promote new ideas, the rest should be persuaded to follow suit.

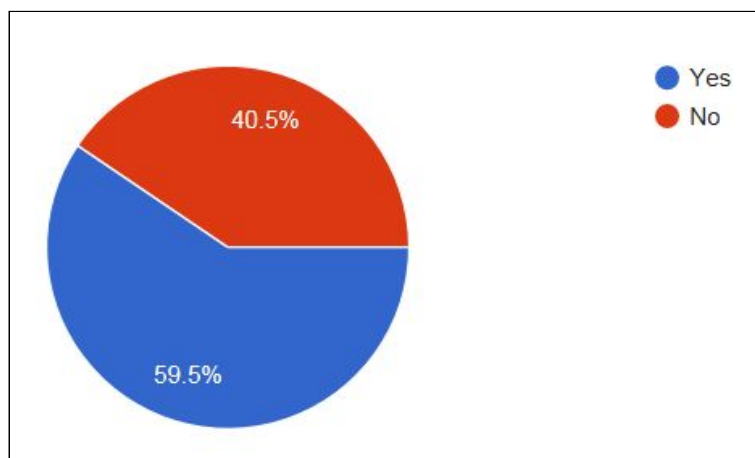


Figure 11: Does your company organize events related to innovation? (37 respondents)

Moreover since, following these events, 59% of our respondents noticed that ideas related to innovation were implemented in their companies. These implementations consisted of creating new tools for documentation to satisfy customer requirements, trying a new medium of documentation, introducing new portals and web based documentation.

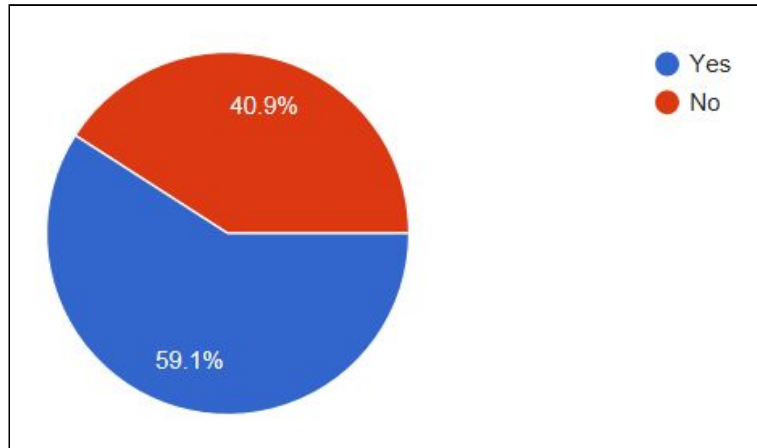


Figure 12: Was one of these ideas implemented in your company? (22 respondents)

For a great majority of the respondents (86.5%), their companies provide training according to their needs and skills. Most companies propose a wide range of training: software, safety, insurance, company products, languages, design, programming, regulation, communication, soft skills, etc. A few companies provide training dedicated to technical writing: technical writing tools, case studies, knowledge management, writing and multimedia skills. In most cases, training is available upon request from the employee but some companies, for example IBM, set up programs to actively encourage training.

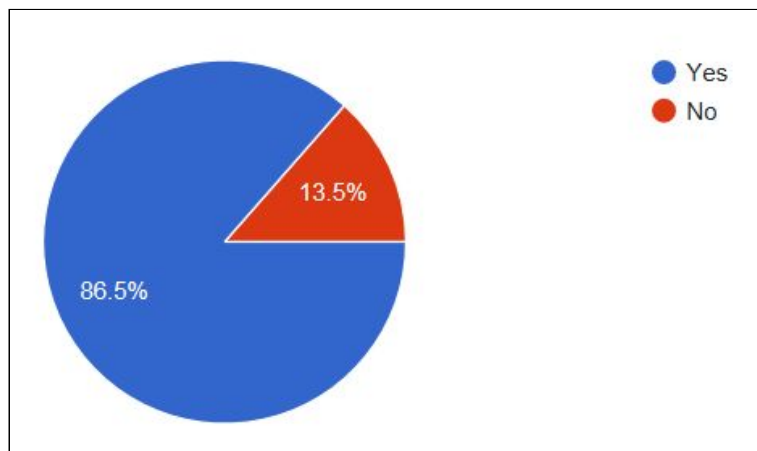


Figure 13: Does your company provide training for its employees? (37 respondents)

Discussion

Discussing hypothesis 1 “Technical innovation (introducing a new tool) improves quality in technical writing.”

Among the 48.6% of our respondents who went through a change in their technical writing tools, 83% estimate it had a positive impact on their work. Among the rest of our respondents, 47.4% deem such a change necessary to improve the quality of their work. Overall, we can calculate that 65% of our respondents actually think that technical innovation has or would have a positive impact on the quality of their work, thus validating our first hypothesis.

As gathered from our respondents, technical innovation in their field enables technical writers to produce documentation, which better fits customers' needs, faster, in larger number, in multiple formats, at a lesser cost and in a way that is more collaborative and integrated into product development.

Despite this majority positive point of view on technical innovation, it is necessary to keep in mind that a third of our respondents were openly reluctant at changing their technical writing tools. Their opinion can be summarized by the saying “If it ain't broke, don't fix it”. Since their present tools are meeting their needs, they do not see the point in going out of their way to change them to try fixing some minor issues while perhaps creating major ones.

This is a valid opinion as most of the respondents who did experience technical innovation in their field insisted that, as worthwhile as it might have been, the transition was not an easy one and did not go through without issues. It solved problems but created new ones and long-term training was needed. With perspicacious reasoning, some of our respondents pointed out a necessary nuance to our first hypothesis: the resources allocated to a technical innovation. In order to effectively improve quality in technical writing, technical innovation requires preliminary assessment of the needs and research of available technologies, careful planning and thorough training. In other words, time and money! It is no wonder then that 66% of these respondents experienced a change after at least five years of job tenure.

Through our respondents' insights, we conclude that, to circumvent resistance to change and avoid poorly prepared transitions, technical innovation should not be considered as a race but rather as virtuous circle based on interest in learning, questioning the change, attention on impact and exploring benefits.

Discussing hypothesis 2 “Technical innovation (introducing a new tool) has a more positive impact on the documentation process than on the final product.”

When asked about the reasons for technical innovation, 67.6% selected enhancing the documentation process, 48.9% enhancing the final documentation and 27% aligning with the competition. It seems clear that when technical writers consider changing their tools, their main motivation is to improve the way they produce documentation: make it easier and faster. For instance, some wish for a more collaborative process, some for one that would be more integrated in their company tools and workflow, and some for an easier way to customize and publish in large numbers and multiple formats.

However, when the respondents who went through a change in their technical writing tools were asked about what actually changed, enhancement of the documentation process came out on top but the gap decreases: 88.9% declared that their documentation process was enhanced but 72.2% of them also indicated that their final documentation was improved.

When asked to develop their answers as to what changed and if it was worthwhile, the respondents mainly wrote about improvements in the documentation process but some underlined the fact that these improvements had a positive side effect on the final documentation.

With a more collaborative or fully integrated process, they allowed developers or SMEs to have access to the documentation, making the content more accurate and ensuring the documentation meets their company's standards and customers' needs. With a more performant publishing process, they had more time to devote to writing, updating and thinking about new ways to improve their documentation.

In the technical writing field, technical innovation usually has a more immediate and obvious positive impact on the process than on the final documentation. But thanks to our respondents, we are now convinced that, if implemented successfully, improvements in the documentation process will fuel improvement of the final documentation. This phenomenon could actually be considered as a marker of the effectiveness of technical innovation.

In addition, we noticed that, despite the prevailing discourse about innovation, numerous technical writers still produce paper-based documentation and still use MS Word as their main tool. Nowadays, MS Word is usually not considered as innovative but some actually went back to it after trying out other seemingly more advanced software products.

This is not evidence that technical writing is any less permeable to innovation than any other fields. A fair number of respondents explained that they changed their technical writing tools to make the documentation more accessible to non-writers (developers, SMEs, R&D). This made us realize that innovation in technical writing does not necessarily lie in new technology but rather in new ways of exchanging information and organizing teams. Perceiving and producing documentation as a product feature like any other and not as a separate deliverable would ensure the quality of the documentation as well as the product.

Discussing hypothesis 3 “An innovation-driven company culture enables technical writers to improve the quality of their work.”

From our respondents who went through a change in their technical writing tools, we gathered that in 72.2% of the cases, the initiative came from management. It is a sign that in a lot of companies, innovation is well integrated in their culture as they choose to recruit managers who actively promote innovation. However, with 27.8% of the changes originating from an individual, companies must set up more direct ways for their employees to come forward when they have new ideas.

And there is still a long way to go: while a great majority of respondents feel that they work in an innovation-driven company, only a quarter of them were directly impacted from the ideas sprung from events related to innovation.

When asked about their company culture, our respondents clearly expressed that they regarded an innovation-driven one as highly valuable. To have the possibility to interact with people from different backgrounds or with new technologies, be it through training, workshops or conferences, enabled them to consider new perspectives in their work, come up with new ideas and sometimes see them implemented.

In their workplace, technical writers sometimes feel as the third wheel of their organization. In such context, it usually appears overwhelming for an individual to promote innovation. But if a company develops a culture that is propitious to new ideas and concepts, its employees will naturally become more involved in finding means to improve their work and thus, their company's competitiveness.

Limitations

Although this research was carefully prepared, we are well aware of its limitations and shortcomings.

First, despite our efforts to circulate the survey as widely as possible, this research was conducted only on a small-size population. Therefore, any generalization we made would have to be verified in a study involving more participants.

Second, we asked only a few questions on company culture in our survey because we wanted to keep it relatively short so as to avoid discouraging potential respondents. Unfortunately, this means our analysis on this point remains shallow. The influence on company culture on the work of technical writers should probably be considered as a research subject in itself.

Third, some of our respondents' answers, either unclear or including remarks on the survey, showed us that we should have asked more precise questions and maybe more questions.

Conclusion

In this digital age and the omnipresence of technology, companies need to keep innovating as a way to keep up with the market. In this context, innovation has been seeping into every sector, including technical writing. However, it is important to keep in mind that with innovation should come quality. Indeed, innovation is only valuable if it enhances the quality of the process, service or product.

In this sense, technical innovation has been valuable as it brought positive changes on both levels: the documentation process for technical writers and the documentation product for users. For technical writers, technical innovation makes the documentation process faster and more collaborative, at a lesser cost. Saved time allows technical writers to focus on users' needs, try new media and tools and think of innovative ideas, always with the aim of providing the best user experience possible. However technical innovation often needs more resources than companies are willing to provide for technical writing departments. For this reason, technical innovation only takes place after years of research, planning and training.

While technical innovation has a more visible impact at the documentation process level, it has equally improved the documentation product. By making the documentation process more collaborative and integrated, technical innovation enables stakeholders to access the documentation, making it more accurate and suited to users' needs. To produce better documentation, it is necessary for shareholders to consider the documentation as a product's feature, and not a separate deliverable. Therefore, it is paramount to fully integrate the documentation process during the product development.

For technical writers, there is a clear correlation between the company culture and innovation. Indeed, innovation can only thrive in an environment that promotes engagement, creativity and acceptance of the change. Companies need to promote innovation in every field, including technical writing, by organizing events related to innovation such as trainings, workshops and conferences. By creating an environment inclined to innovation, employees will be more willing to come up with new ideas and therefore contribute to the company's growth and success.

There is still an immense amount of research to do to fully understand the relationship between innovation and quality in technical writing. We focused our research on the impact of technical innovation but it is not the only form of innovation: new ways of organizing teams and sharing information may have a greater impact. We hope that others curious minds will research these possibilities.

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