How to Tell Your Research Story

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Abstract—Conducting effective scientific research requires a sound methodology and a well-rounded set of skills, which are often acquired “on-the-job” rather than formally taught. This paper addresses this process from a new perspective by drawing tight similarity between scientific research and story telling. We use research in the engineering and sciences as an illustrative example for discussion.

I. INTRODUCTION

Scientific research and the skills one develops to conduct sound, rigorous and impactful research, have often been undervalued by different communities. More importantly, disseminating research outcomes, whether in the form of a written publication or a visual, is key in reflecting the quality of the work. That is, a properly written/presented work with basic contribution, has often had more success than a more sophisticated one with modest presentation.

There are several excellent notes/papers/articles focusing on how to read, write or review a research paper [1]–[3]. However, these have mostly focused on the technical aspect of such processes (in terms of content and organization) and less on their narrative. My experience as a researcher made me realize that we can be best described as “story tellers”, more so than salesmen, marketers, or CEOs. Indeed, conducting “good” scientific research should lead to telling a “good” story.

Fresh graduate students can benefit a lot by learning what the components of a good story are and how they are similar to conducting good research, as it may help them approach research problems and dissemination of results in a more effective and impactful manner. More importantly, it may help them acquire and/or foster key skills that are transferable to any industry or role.

II. COMPONENTS OF A GOOD STORY

In the business world, storytelling is one of the essential tools for marketing and sales, as it stimulates the imagination of the customers and builds a sense of community between corporations and clients. A good story is original and emphatic, and most importantly consistent without sacrificing integrity. According to the German drama writer Gustav Freytag, there are five key elements that make up a “good” story [4]:

1) Exposition: This is the initial part of the story in which the stage is set for the main action. It also introduces the point of view, i.e., the position from which the story is being told.

2) Rising action: After a relatively calm exposition, there is a gradual tension rising in the story using danger, hazard, conflict and other devices. It often occurs through several storylines, which all act together to create excitement in the story.

3) Climax: It is often the most exciting part of the story, where a lot of major action happens.

4) Falling action: After the excitement of the climax, the story may not yet be complete and there can still be unresolved and outstanding tensions that await closure.

5) Resolution: After the excitement of the action and climax within the story, the final scenes tie off all remaining loose ends and bring the story to a satisfying and final resolution.

Interestingly, dissemination of scientific research findings (in writing via articles in scientific journals, or via oral presentations and visuals), especially in the engineering and sciences, has a very similar structure (a general mapping is shown in Fig. 1); it only differs in the presentation and content. In the following section, we break this process down and draw the comparison between the two paradigms.

III. TELLING YOUR RESEARCH STORY

A typical research product (article or presentation) comprises six key story elements, which most of the times appear in the following order: 1) introduction; 2) problem statement; 3) literature review; 4) new solution; 5) performance evaluation; and 6) conclusions, remarks and future work. A good research story, just like regular stories, is one that ties these elements together in a cohesive and sequentially sound manner, so as to sustain the reader’s attention and focus, without compromising depth and meaning.

A. Introduction

In general, I typically recommend to leave the write-up/preparation of the introduction until the end, as the tone and thoughts in this section can be greatly affected by the other sections.

Just like the Exposition, this section is your chance to catch the attention of the audience or community that your research is targeting. You can do so by providing a brief history (and sometimes key statistics) that highlight the relevance of the subject at large, and why it is important to resolve related challenges (e.g., the number of IoT devices is predicted to reach 50 billion by year 2020).
1) Description of focused subject to be investigated: Also in the introduction, you should discuss the specific research subject, and highlight the timeliness of solving problems in this area and the impact of that on humanity, in general, and on the research field, in particular (e.g., cloud computing has emerged as a popular paradigm for delivering killer applications with cost and operation advantages to organizations).

2) Problem statement and motivation: Next, you should clearly define the problem, and provide a very strong motivation relevant to the described subject (e.g., studies showed how ... improves the system performance. Thus, deploying ... can provide guaranteed user satisfaction). Just like the Rising Action of a good story, this is where you should typically excite the reader and make him/her eager to learn about the solution that you are proposing.

B. Literature Review

Strong research must critically describe and discuss with an up-to-date review all the efforts that attempted to solve directly or indirectly the same (or part of the) problem. Thus, just like the Rising Action phase of a good story, this section can inject the excitement factor by hinting to the reader how the proposed solution is somehow “better” and novel. Most importantly, the reader would trust that you have done your homework, and are fully aware of what is out there.

In your literature review, you must assess the advantages, disadvantages and constraints of each proposed solution. In other words, there is no perfect solution that works anywhere anytime; thus, these must be identified and discussed to be then used as motivating arguments for the proposed solution(s). For every “criticized” work, you should state how your proposed solution(s) is different or better (e.g., the authors of ... proposed ... to solve the problem of ...; however, they did not address ...). This helps the reader easily identify your contributions and how they are different from existing works, and in a way observe the “conflict” between previous works and what you are proposing.

C. Proposition of a New Solution

The new solution(s) must be sound, and justified. If you have some assumptions, make sure they are clearly discussed and listed, with a valid justification on why they were made and how. A well described solution must keep the reader excited. Make sure to keep things simple when they should, and attempt to simplify what may seem complex (of course, to a certain extent, and without loss of meaning). Just like the Climax of a good story, a well written solution section must leave the reader with the “wow” effect, so that they look forward to observing the performance of the new solution, and how it was able to outperform other existing solutions (if any).

D. Performance Evaluation

This section is where the proposed solution(s) is evaluated and compared with existing solutions (if any). Typically, the performance of the solution is evaluated analytically (i.e., mathematically) or experimentally (i.e., via testbed or simulations). In either case, the environment for testing must be adequate and more or less mimics a real-life scenario; or at the very least, it should be based on widely-used/accepted environments in the related art. In the event where you have a completely new environment, make sure the selected parameters are scientifically (not randomly) chosen.

This section is where the “grande finale” (i.e., Resolution) is presented to the reader, where he/she can observe why your solution is so great, and how it is better than other solutions (given a specific context of course). Most importantly, this is your chance to convince the “target customer” (e.g., a database administrator, or a telecom operator, etc.) why he/she would benefit a lot by employing it.

E. Conclusions, Remarks and Future Work

Finally, a good conclusion section should more or less reiterate what the abstract states, but with adding some final concluding remarks, and possibly notes for future extensions of the work. This is where you give the reader “closure” and leave him/her satisfied from reading your paper and finding it very useful; thus, the final piece of the Resolution.

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REFERENCES


