RESEARCH METHODOLOGY: A PRACTITIONER APPROACH

By

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ABSTRACT

The ultimate goal of scientific research is publication so as to showcase the research outcomes. Scientists, starting as graduate students, are measured primarily not by their dexterity in laboratory manipulations, not by their innate knowledge of either broad or narrow scientific subjects, and certainly not by their wit or charm; they are measured, and become known by their publications. A scientific experiment, no matter how spectacular the results, is not completed until the results are published. In fact, the cornerstone of the philosophy of science is based on the fundamental assumption that original research must be published; only thus can new scientific knowledge be authenticated and then added to the existing databases. In this paper, a practitioners approach to write an effective paper is presented in a chronological order. Further, writing style of effective research paper, a review technique to conduct a methodical survey in a systematic manner and finally an effective research plan for forthcoming research scholars is discussed. This research work provides an effective direction to write, submit and publish the effort put into doing research into a published form.

Keywords: Research Methodology, Practitioner Approach, Scientific Paper, Research Plan, Writing Style.

INTRODUCTION

Most of today's scientists did not have the chance to undertake a formal course in scientific writing. As graduate students, they learned to imitate the style and approach of their professors and previous authors [1]. Some scientists became good writers anyway. Many, however, learned only to imitate the prose and style of the authors before them - with all their attendant defects - thus establishing a system of error in perpetuity [2]. The purpose of this research paper is to help scientists and students of the sciences in all the disciplines to prepare manuscripts that will have a high probability of being accepted for publication and of being completely understood when they are published [3]. Because the requirements of Journals vary widely from discipline to discipline, and even within the same discipline, it is not possible to offer recommendations that are universally acceptable [4]. In this research paper, certain basic principles that are accepted in most disciplines to write a research paper have been presented in detail.

1. Motivation for Research

The motivation of this research work stems from the challenges faced by research scholars in writing, submitting and publishing an effective research paper. This research paper plays an important role for those research scholars who want to start research from basic level and want to publish research work in reputed Journal. Research scholars are not effective in writing good research paper, because most of today's scientists did not have the chance to undertake a formal course in scientific writing. Step by step preparation of research paper is laudable for research scholars. This research work serves as a basic guide for beginners and helps them to publish research paper in reputed journal.

2. Paper Organization

The organization of rest of this paper is as follows: Section 3 presents the contribution of this paper, Section 4 presents a research methodology for effective writing of research paper and including writing style of effective research paper, a review technique to conduct a methodical survey in a systematic manner and an effective research plan for forthcoming research scholars. Section 5 presents the recommendations and implications for research scholars and professional experts. Finally this research work is

concluded at last.

3. Contributions

This research paper contributes in the area of writing effective research paper for those research scholars who did not have the chance to undertake a formal course in scientific writing. The main objectives of this research includes: i) to discuss writing style of effective research paper, ii) to describe a review technique that can be used to conduct a methodical survey in a systematic manner and ii) to discuss an effective research plan for forthcoming research scholars. Basically this research paper (Section 4.1) is precise form of already published research book [2] but that book is very vast and requires lot of time to read and difficult to understand. This research work is done to make those concepts easy to understand and presented in precise form, so research scholars can use it as "The Beginner's Guide on Writing an Effective Research Paper". Basically author of this research work wants to share their research experience that will be helpful for those who wants to start their research from basic level.

4. An Effective Writing Style: Research Perspective

In this section, firstly writing style of effective research paper is discussed, secondly, a review technique that can be used to conduct a methodical survey in a systematic manner is described and finally an effective research plan for forthcoming research scholars is discussed.

4.1 An Effective Way to Write a Scientific Research Paper: From Title to Acceptance

This section describes the writing style of scientific paper as studied from various existing literature [1] [2] [3] [4]. After studying a lot of books, research papers [5-11] [12] [13] related on "how to write a research paper". Finally a layout to write a scientific research in an effective manner is designed. The sub-sections mandatory to include in the effective research paper are discussed below in chronological order for better understanding:

4.1.1 Scientific Paper

A scientific paper is a written and published report describing original research results. That short definition must be qualified, however, by noting that a scientific paper must be written and published in a certain way, as defined by three centuries of developing tradition, editorial practice, scientific ethics, and the interplay of printing and publishing procedures. A scientific paper is organized to meet the requirements of valid publication. It is, or should be, highly stylized, with distinctive and clearly evident component parts. The most common labeling of the component parts, in the basic sciences, is Introduction, Methods, Results, and Discussion. If "scientific paper" is the term for an original research report, how should this be distinguished from research reports that are not original, or are not scientific, or somehow fail to qualify as scientific papers? Several specific terms are commonly used: "review paper," "conference report "and" meeting abstract."

4.1.2 Prepare the Title

"First impressions are strong impressions; a title ought therefore to be well studied, and should give, as far as its limits permit, a definite and concise indication of what is to come." In preparing a title for a paper, the author would do well to remember one salient fact: That title will be read by thousands of people. Perhaps few people, if any, will read the entire paper, but many people will read the title, either in the original Journal or in one of the secondary (abstracting and indexing) publications. Therefore, all words in the title should be chosen with great care, and their association with one another must be carefully managed. Perhaps the most common error is defective titles, and certainly the most damaging in terms of comprehension, is faulty syntax (word order). Remember that the indexing and abstracting services depend heavily on the accuracy of the title, as do the many individual computerized literature-retrieval systems in use today. An improperly titled paper may be virtually lost and never reach its intended audience. The title of a paper is a label, it is not a sentence, with the usual subject, verb, object arrangement. It is simpler than a sentence (or, at least, usually shorter), but the order of the words becomes even more important. Actually, a few Journals do permit a title to be a sentence. As an aid to readers, "running titles" or "running heads" are printed at the top of each page. Often, the title of the Journal or book is given at the top of left-facing pages and the article or chapter title is given at the top of right-facing

pages. Usually, a short version of the title is needed because of space limitations. The maximum character count is likely to be given in the Journal's Instructions to Authors. It is wise to suggest an appropriate running title on the title page of the manuscript.

4.1.3. Prepare the Abstract

An Abstract should be viewed as a mini version of the paper. It should provide a brief summary of each of the main sections of the paper: Introduction, Materials and Methods, Results, and Discussion. "An abstract can be defined as a summary of the information in a document." or "A well-prepared abstract enables readers to identify the basic content of a document quickly and accurately, to determine its relevance to their interests, and thus to decide whether they need to read the document in its entirety". It should not exceed 250 words and should be designed to define clearly what is dealt with in the paper. It should be typed as a single paragraph. Some Journals now run "structured" abstracts consisting of a few brief paragraphs. Many people will read the Abstract only to find whether paper is suitable for them or not. The Abstract should (i) state the principal objectives and scope of the investigation, (ii) describe the methods employed, (iii) summarize the results, and (iv) state the principal conclusions. The importance of the conclusions is indicated by the fact that they are often given three times: once in the Abstract, again in the Introduction, and again in the Discussion.

Most or the entire Abstract should be written in the past tense, because it refers to work done. It should never give any information or conclusion that is not stated in the paper. References to the literature must not be cited in the Abstract (except in rare instances, such as modification of a previously published method). Two types of abstracts are: i) informative abstract and ii) indicative abstract. Informative abstract is designed to condense the paper. It can and should briefly state the problem, the method used to study the problem, and the principal data and conclusions. Often, the abstract supplants the need for reading the full paper; without such abstracts, scientists would not be able to keep up in active areas of research. This is the type of abstract that is used as a "heading" in most Journals today. Another common type of abstract is the indicative abstract (sometimes called a descriptive abstract). This type of abstract is designed to indicate the subjects dealt with in a paper, making it easy for potential readers to decide whether to read the paper. However, because of its descriptive rather than substantive nature, it can seldom serve as a substitute for the full paper.

4.1.4. Writing Introduction

The first section of the text paper should, of course, be the Introduction. The purpose of the Introduction should be to supply sufficient background information to allow the reader to understand and evaluate the results of the present study without needing to refer to previous publications on the topic. The Introduction should also provide the rationale for the present study. Above all, research scholar should state briefly and clearly purpose of writing the paper. Choose references carefully to provide the most important background information. Much of the Introduction should be written in the present tense, because author will be referring primarily to their problem and the established knowledge relating to it at the start of research work.

Suggested rules for a good introduction are as follows: (i) The Introduction should present first, with all possible clarity, the nature and scope of the problem investigated. (ii) It should review the pertinent literature to orient the reader. (iii) It should state the method of the investigation. If deemed necessary, the reasons for the choice of a particular method should be stated. (iv) It should state the principal results of the investigation. (v) It should state the principal conclusion(s) suggested by the results. Do not keep the reader in suspense; let the reader follow the development of the evidence. If the author has previously published a preliminary note or abstract of the work, author should mention this (with the citation) in the Introduction. If closely related papers have been or are about to be published elsewhere, author should say so in the Introduction, customarily at or toward the end. Such references help to keep the literature neat and tidy for those who must search it.

In addition to the above rules, keep in mind that author's paper may well be read by people outside author's narrow specialty. Therefore, the Introduction is the proper place to

define any specialized terms or abbreviations that author intend to use. Rest of terms should be described in Appendix Section.

4.1.5. Writing Literature Review

A literature review is not an original section. On occasion, a review will contain new data (from the author's own laboratory) that have not yet appeared in a primary Journal. However, the purpose of a literature review is to review previously published literature and to put it into some kind of perspective. A literature review is usually long, typically ranging between 1 and 3 pages. The subject is fairly general, compared with that of research papers. And the literature review is, of course, the principal product. However, a really good literature review is much more than annotated bibliographies. They offer critical evaluation of the published literature and often provide important conclusions based on that literature. The organization of a literature review is usually different from that of a research paper. Obviously, the Materials and Methods, Results, Discussion arrangement cannot readily be used before literature review.

The cardinal rule for writing a literature review is preparing an outline. The outline must be prepared carefully. The outline will assist author in organizing their paper, which is all-important. If author's literature review is organized properly, the overall scope of the paper will be well defined and the integral parts will fit together in logical order. Obviously, author must prepare the outline before author start writing. Moreover, before author start writing, it is wise to determine literature review written in existing research papers. Author has to compare the existing techniques based on some important key parameters with proposed technique in tabular form as shown in Table 1.

4.1.6. Methods Section (Proposed Technique)

In the first section of the paper, the Introduction, author stated (or should have) the methodology employed in the study. If necessary, author also defended the reasons for author's choice of a particular method over competing methods. Now, in Methods, author must give the full details. Most of this section should be written in the past tense. The main purpose of the Methods section is to describe (and if necessary defend) the experimental design and then

Approach	Key Parameter 1	Key Parameter 2	Key Parameter 3
Proposed Technique	No	Yes	Yes
Existing Technique 1 [Ref]	No	No	No
Existing Technique 2 [Ref]	No	No	No
Existing Technique 3 [Ref]	Yes	No	No
Existing Technique 4 [Ref]	Yes	Yes	No

Table 1. Comparison of Proposed Technique with Existing Techniques

provide enough detail so that a competent worker can repeat the experiments. Many (probably most) readers of author's paper will skip this section, because they already know (from the Introduction) the general methods author used and they probably have no interest in the experimental detail. However, careful writing of this section is critically important because the cornerstone of the scientific method requires that author's results, to be of scientific merit, must be reproducible; and, for the results to be adjudged reproducible, author must provide the basis for repetition of the experiments by others. That experiments are unlikely to be reproduced is beside the point; the potential for reproducing the same or similar results must exist, or author's paper does not represent good science. When author's paper is subjected to peer review, a good reviewer will read the Methods carefully. If there is serious doubt that author's experiments could be repeated, the reviewer will recommend rejection of author's manuscript no matter how awe-inspiring are author's results.

For content, include the exact technical specifications and quantities and source or method of preparation. Avoid the use of trade names; use of generic names is usually preferred. This avoids the advertising inherent in the trade name. Besides, the non-proprietary name is likely to be known throughout the world, whereas the proprietary name may be known only in the country of origin. However, if there are known differences among proprietary products and if these differences might be critical, then use of the trade name, plus the name of the manufacturer, is essential. When trade names, which are usually registered trademarks, are used, they should be capitalized to distinguish them from generic names. Because the value of author's paper (and author's reputation) can be damaged if author's results are not reproducible, author must describe research materials with great care. Be sure to examine the Instructions to Authors of the Journal to

which author.

For methods, the usual order of presentation is chronological. Obviously, however, related methods should be described together, and straight chronological order cannot always be followed. For example, even if a particular assay was not done until late in the research, the assay method should be described along with the other assay methods, not by itself in a later part of Materials and Methods. The Methods section usually has subheadings. When possible, construct subheadings that "match" those to be used in Results. The writing of both sections will be easier if author strives for internal consistency, and the reader will be able to grasp quickly the relationship of a particular methodology to the related Results.

Statistical analyses are often necessary, but author should feature and discuss the data, not the statistics. Generally, a lengthy description of statistical methods indicates that the writer has recently acquired this information and believes that the readers need similar enlightenment. Ordinary statistical methods should be used without comment; advanced or unusual methods may require a literature citation. In describing the methods of the investigations, author should give sufficient details so that a competent worker could repeat the experiments. If author's method is new (unpublished), author must provide all of the needed detail. However, if a method has been previously published in a standard Journal, only the literature reference should be given.

Do not make the common error of mixing some of the Results in this section. There is only one rule for a properly written Methods section: Enough information must be given so that the experiments could be reproduced by a competent colleague. A good test, by the way (and a good way to avoid rejection of author's manuscript), is to give a copy of author's finished manuscript to a colleague and ask if he or she can follow the methodology. It is quite possible that, in reading about author's Methods, author's colleague will pick up a glaring error that author missed simply because author was too close to the work. Mistakes in grammar and punctuation are not always serious; the meaning of general concepts, as expressed in the Introduction and Discussion. In Methods, however, exact and specific items are being dealt with and precise use of English is a must.

4.1.7. Writing Results

So now come to the core of the paper, the data. This part of the paper is called the Results section. Contrary to popular belief, author shouldn't start the Results section by describing methods that author inadvertently omitted from the Methods section. There are usually two ingredients of the Results section. First, author should give some kind of overall description of the experiments, providing the "big picture," without, however, repeating the experimental details previously provided in Methods. Second, author should present the data. Author's results should be presented in the past tense. Of course, it isn't quite that easy. How do author present the data? A simple transfer of data from laboratory notebook to manuscript will hardly do. Most importantly, in the manuscript author should present representative data rather than endless repetitive data. The fact that author could perform the same experiment 100 times without significant divergence in results might be of editors, not to mention readers, prefer a little bit of predigestion.

The results should be short without verbiage. Although the Results section of a paper is the most important part, it is often the shortest, particularly if it is preceded by a well-written Methods section and followed by a well-written Discussion. The Results need to be clearly and simply stated because it is the Results that constitute the new knowledge that the author is contributing to the world. The earlier parts of the paper (Introduction, Methods) are designed to tell why and how author got the Results; the later part of the paper (Discussion) is designed to tell what they mean.

Obviously, therefore, the whole paper must stand or fall on the basis of the Results. Thus, the Results must be presented with crystal clarity. Do not be guilty of redundancy in the Results. The most common fault is the repetition in words of what is already apparent to the reader from examination of the figures and tables. Even worse is the actual presentation, in the text, of all or many of the data shown in the Tables or Figures.

4.1.7.1. Design Effective Tables

Before proceeding to the "how to" of tables, let us first

examine the question "whether to." As a rule, do not construct a table unless repetitive data must be presented. There are two reasons for this general rule. First, it is simply not good science to regurgitate reams of data just because author have them in author's laboratory notebooks; only samples and breakpoints need to be given. Second, the cost of publishing tables is very high compared to that of text, and all of us involved with the generation and publication of scientific literature should worry about the cost.

If author made (or need to present) only a few determinations, give the data in the text. The data presented in the table can be presented in the text itself in a form that is readily comprehensible to the reader, while at the same time avoiding the substantial additional typesetting cost of tabulation.

4.1.7.2. Prepare Effective Graphs

Certain types of data that should not be tabulated, for that use graphical view. They should not be turned into figures either. Basically, graphs are pictorial tables. Certain types of data, particularly the sparse type or the type that is monotonously repetitive, do not need to be brought together in either a table or a graph. The facts are still the same: The cost of preparing and printing an illustration is high, and it should consider illustrating that data only if the result is a real service to the reader. This bears repeating because many authors, especially those who are still beginners, think that a table, graph, or chart somehow adds importance to the data. Thus, in the search for credibility, there is a tendency to convert a few data elements into an impressive-looking graph or table. Author's more experienced peers and most Journal editors will not be fooled; they will soon deduce that (for example) three or four curves in author's graph are simply the standard conditions and that the meaning of the fourth curve could have been stated in just a few words. If there is only one curve on a proposed graph, can author describe it in words? Possibly only one value is really significant, either a maximum or a minimum; the rest is window dressing. If the choice is not graph versus text but graph versus table, author's choice might relate to whether author want to impart to readers exact numerical values or simply a picture of the trend or shape of the data. Rarely, there might be a reason to present the same data in both a table and a graph, the first presenting the exact values and the second showing a trend not otherwise apparent. Most editors would resist this obvious redundancy, however, unless the reason for it was compelling. Graphs (which are called line drawings in printing terminology) are very similar to tables as a means of presenting data in an organized way. In fact, the results of many experiments can be presented either as tables or as graphs.

Table 2 represents the results in tabular form and Figure 1 represents the results in graphical form that has been taken from published research papers [17] [18].

4.1.8. Write the Discussion

The Discussion is harder to define than the other sections. Thus, it is usually the hardest section to write. And, whether author knows it or not, many papers are rejected by Journal editors because of a faulty Discussion, even though the data of the paper might be both valid and interesting. Even more likely, the true meaning of the data may be completely obscured by the interpretation presented in the Discussion, again resulting in rejection. Many, if not most, Discussion sections are too long and verbose.

What are the essential features of a good Discussion? The

Cloud Workloads Detail			
Wld	*Wd(sec)*	B_E ($)	E_t
W1	12:00	100	12
W2	4:00	62	6.45
W3	6:00	120	5
W4	21:00	170	12.35
W5	10:00	155	6.45
W6	2:00	200	1
W7	4:00	252	1.58
W8	20:00	265	7.54
W9	4:00	72	5.55
W10	14:00	65	21.53

Table 2. Results in Tabular Form [18]

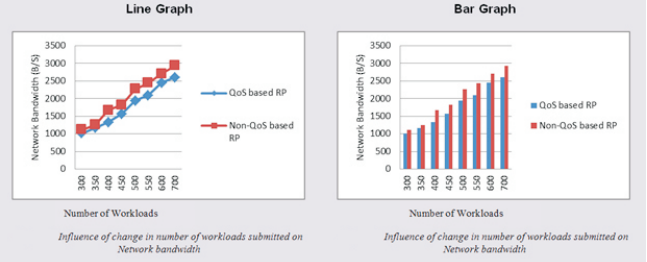

Figure 1. Results in Graphical Form [17]

main components of Discussion will be provided if the following commands are followed:

- Try to present the principles, relationships, and generalizations shown by the Results. And bear in mind, in a good Discussion, author discusses and does not recapitulate -the Results.
- Point out any exceptions or any lack of correlation and define unsettled points. Never take the high-risk alternative of trying to cover up data that do not quite fit.
- Show how author's results and interpretations agree (or contrast) with previously published work.
- Don't be shy; discuss the theoretical implications of author's work, as well as any possible practical applications.
- State author's conclusions as clearly as possible.
- Summarize author's evidence for each conclusion.

In simple terms, the primary purpose of the Discussion is to show the relationships among observed facts. Too often, the significance of the results is not discussed or not discussed adequately. In showing the relationships among observed facts, author does not need to reach cosmic conclusions.

4.1.9. Write the Conclusion(s) and Future Directions

The complete work that has been explained in the research paper from introduction to discussion is mentioned in this section precisely for the purpose of easy understanding. Conclusion should be written in a precise form with 5-6 lines in which important finding of proposed method, experimental outcomes should be discussed. Further, 1-2 lines should be mentioned about the future direction to carry out further research work.

4.1.10. State the Acknowledgments

As to the Acknowledgments, two possible ingredients require consideration. First, author should acknowledge any significant technical help that author received from any individual, whether in author's laboratory or elsewhere. Author should also acknowledge the source of special equipment, cultures, or other materials. Second, it is usually the Acknowledgments wherein author should acknowledge any outside financial assistance, such as grants, contracts.

4.1.11. Appendix

If any acronyms or notation is used in research paper earlier, then it is mandatory to mention in the last after the Conclusion(s) and Future Directions. Appendix can be written like:

Appendix A. Acronyms

QoS	Quality of Service
SLA	Service Level Agreement
RPM	Resource Provisioning Mechanism
RPA	Resource Provisioning Agent

4.1.12. References

At the end of research paper, it is mandatory to write the references from where literature work is done. For writing references, every Journal has their different format (APA, IEEE, ACM etc.) to write reference of Book, Article, Journal, Conference, website, etc.

4.1.13. Select a Journal and Submit Paper

The choices of where and how to submit the manuscript are important. Some manuscripts are buried in inappropriate Journals. Others are lost, damaged, or badly delayed because of carelessness on the part of the author. The first problem is where to submit the manuscript. (Actually, author will have already reached a decision on this point before the typing of the manuscript in accordance with the Instructions to Authors.) Obviously, author's choice depends on the nature of author's work; author must identify those Journals that publish in author's subject area [16]. A good way to get started or to refresh author's memory is to scan a recent issue of Current Contents. It is usually easy to determine, on the basis of Journal titles alone, which journals might publish papers in author's field. Only by examination of the tables of contents, however, can author determine which Journals are publishing papers in author's field. Author may also elicit useful information by talking to colleagues. To identify which Journals might publish author's manuscript, author should do several things: Abstracting and Indexing, Volume Number, Frequency of Issues, Impact Factor, Scope etc.

4.1.14 Review Process

After submission of research paper, review process is

started as shown in Figure 2. The peer review process for Journal publication is essentially a quality control mechanism. It is a process by which experts evaluate scholarly works, and its objective is to ensure a high quality of published science. However, peer reviewers do not make the decision to accept or reject papers.

At most, they recommend a decision. At peer-reviewed Journals, decision-making authority rests solely with journal editors or the Journal's editorial board. Indeed, it is the Journal editor who is considered to be central to the decision making process. Typically, after a paper is submitted to a Journal, a Journal editor screens the manuscript and decides whether or not to send it for full peer review. Only after clearing the initial screening is the manuscript sent to one or more peer reviewers. Finally, Journal editors or the Journal's editorial board consider the peer reviewers' reports and make the final decision to accept or reject the manuscript for publication.

4.2 A Review Technique to Conduct a Methodical Survey

In this section, a review technique is presented which can be used to conduct a systematic review in a large set of research papers. Details of review technique used to find the outcomes can be found in review papers [12] [13]. This review technique describes research methodology used to identify the key challenges and issues in existing literature. Review technique comprise of following important sections:

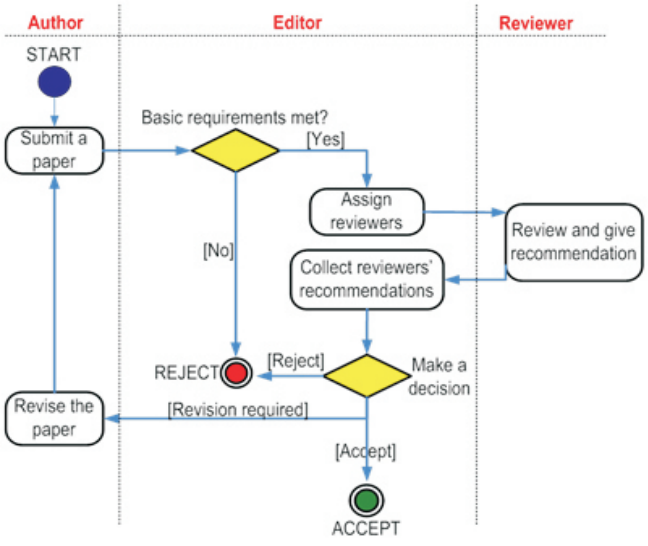

Figure 2. Review Process

4.2.1 Sources of Information

In order to gain a wide outlook, as recommended in Brereton's strategies [12] [13], literature has been searched broadly in e-resources. The databases covered are:

- ACM Digital Library (<www.acm.org/dl>)
- IEEE xplore (<www.ieeexplore.ieee.org>)
- ScienceDirect (<www.sciencedirect.com>)
- Google Scholar (<www.scholar.google.co.in>)

These databases cover the most related Journals and Conference, Symposium and Workshop proceedings within a particular research area.

4.2.2 Search Criteria

A set of keywords and its synonyms were defined as search strings. As research on particular research area is still innovative, suppose particular year range (2005-2013) was included in the search. The keywords as well as its synonyms are described in Table 3.

4.2.3 Study Selection

A set of inclusion and exclusion criteria are described for the selection of research papers. These criteria were then used in the research procedure during searching. Figure 3 demonstrates the research procedure.

Using the keywords, searching was accomplished on the selected e-resources using the provided search engine described in Table 2. Once the list of n research papers was found, the papers were omitted according to the title, abstract and conclusion [14]. Finally, reference investigation was accompanied to ensure that referenced papers were not skipped and at the same time, the similar papers returned by different e-resources were removed to eliminate identical key challenges. Reference investigation is significant as some of the publications might have been skipped during the keywords based search using search engines and during elimination based on title, abstract, conclusion and full text [15]. By observing the reference section at the end of each research paper, related research papers that are skipped previously can be

Keywords	Synonyms	Year
Keyword 1	Synonym of Keyword 1	
Keyword 2	Synonym of Keyword 2	2005-2013

Table 3. Search Keywords and Synonyms

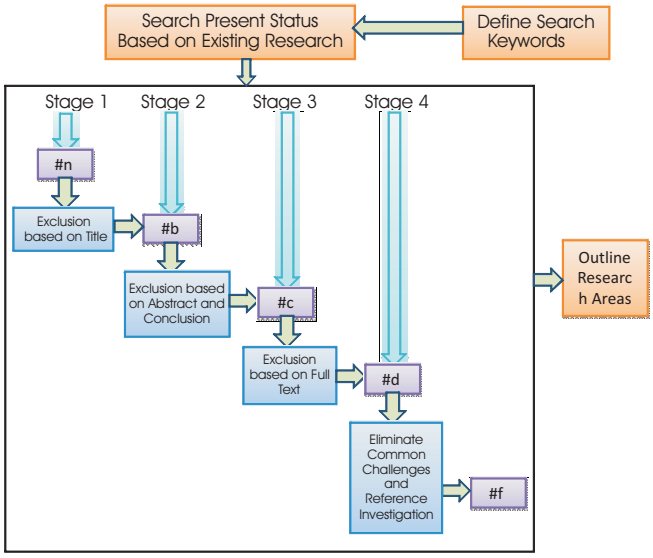

Figure 3. Research Procedure

included in the research procedure. Number of research papers reduced from #n to #f (final list of research papers related to particular topic considered for review).

4.2.4 Results and Discussion

A total of f research papers related to particular research area were returned by the research procedure. In total f articles appeared in electronic and manual search. Table 4 describes the number of papers published from the year 2005 to 2013.

The research papers were then classified into 4 groups; Symposiums, Journals, Conferences and Workshops. The largest percentages of publications came from Conferences (15 papers) followed by Journals (14 papers). The Symposiums (6 papers) and Workshops contributed 7 papers to each of the overall publication categories as shown in Figure 4.

4.2.5 Evolution of Particular Research Area

Evolution of particular research area across various years can be described in Figure 5. Suppose during year 2009 to 2015, 7 research techniques of a particular research area have been developed and the Key finding of that technique is written along with technique.

4.3 An Effective Research Plan for Future Research Scholars

In this section, an effective research plan to conduct a research step by step is described that will be helpful for

Year	No. of Research Papers
2005	2
2007	2
2008	3
2009	8
2010	7
2011	7
2012	4
2013	3

Table 4. Numbers of Papers Published in Each Year

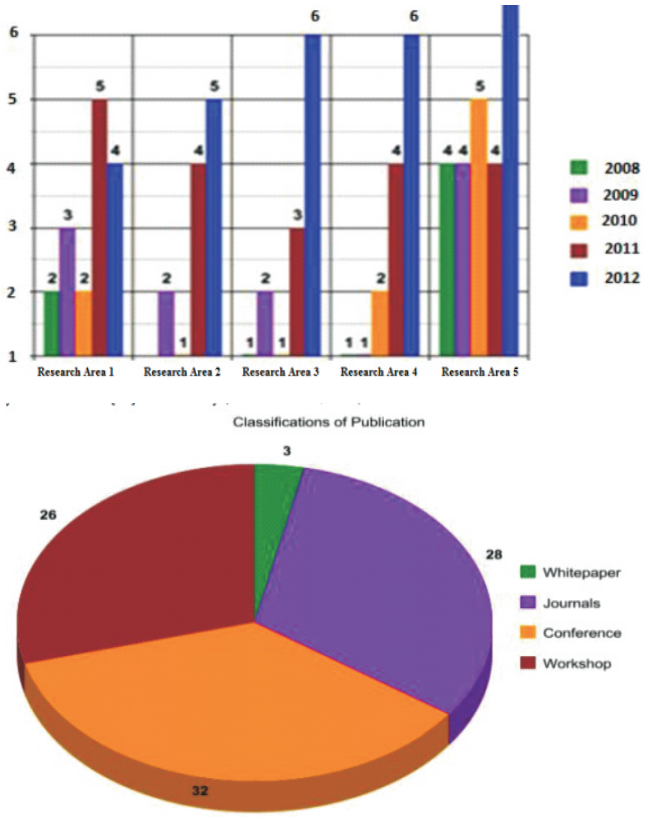

Figure 4. Outcomes and Results

future research scholars. Proposed effective research plan is shown in Figure 6.

5. Recommendations and Implications for Research Scholars and Professional Experts

This research work has implications for both research scholars and professional experts who are doing research in different and hotspot areas and looking for new ideas to write a research paper. A number of innovative ideas are presented in this research work for research scholars and professional experts. The inspiration of this research work trunks from the challenges faced by research scholars in writing, submitting and publishing an effective research

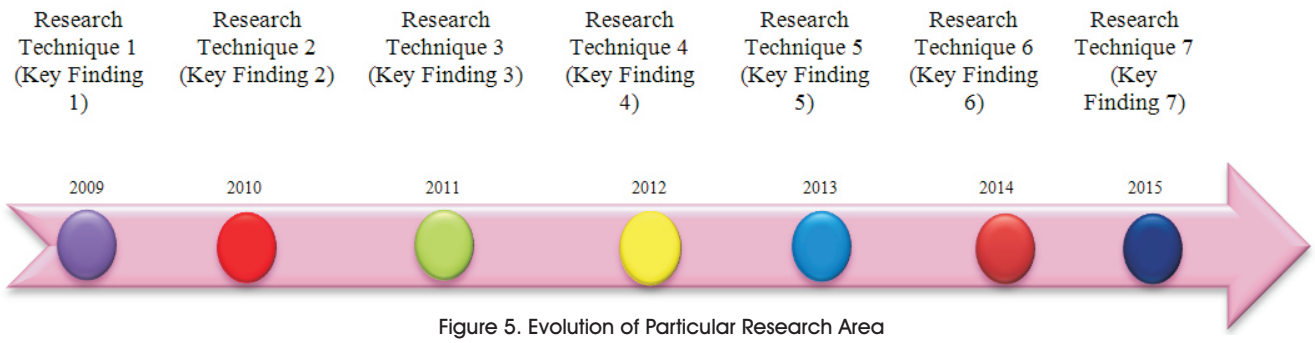

Figure 5. Evolution of Particular Research Area

paper. This research paper plays an important role for those research scholars who want to start research from basic level and want to publish research work in reputed Journal. Research scholars are not effective in writing good research paper because most of today's scientists did not have the chance to undertake a formal course in scientific writing. The purpose of this research paper is to help scientists and students of the sciences in all disciplines to prepare manuscripts that will have a high probability of being accepted for publication and of being completely understood when they are published. Step by step preparation of research paper is laudable for research scholars. This research work serves as a basic guide for beginners and helps them to publish research paper in

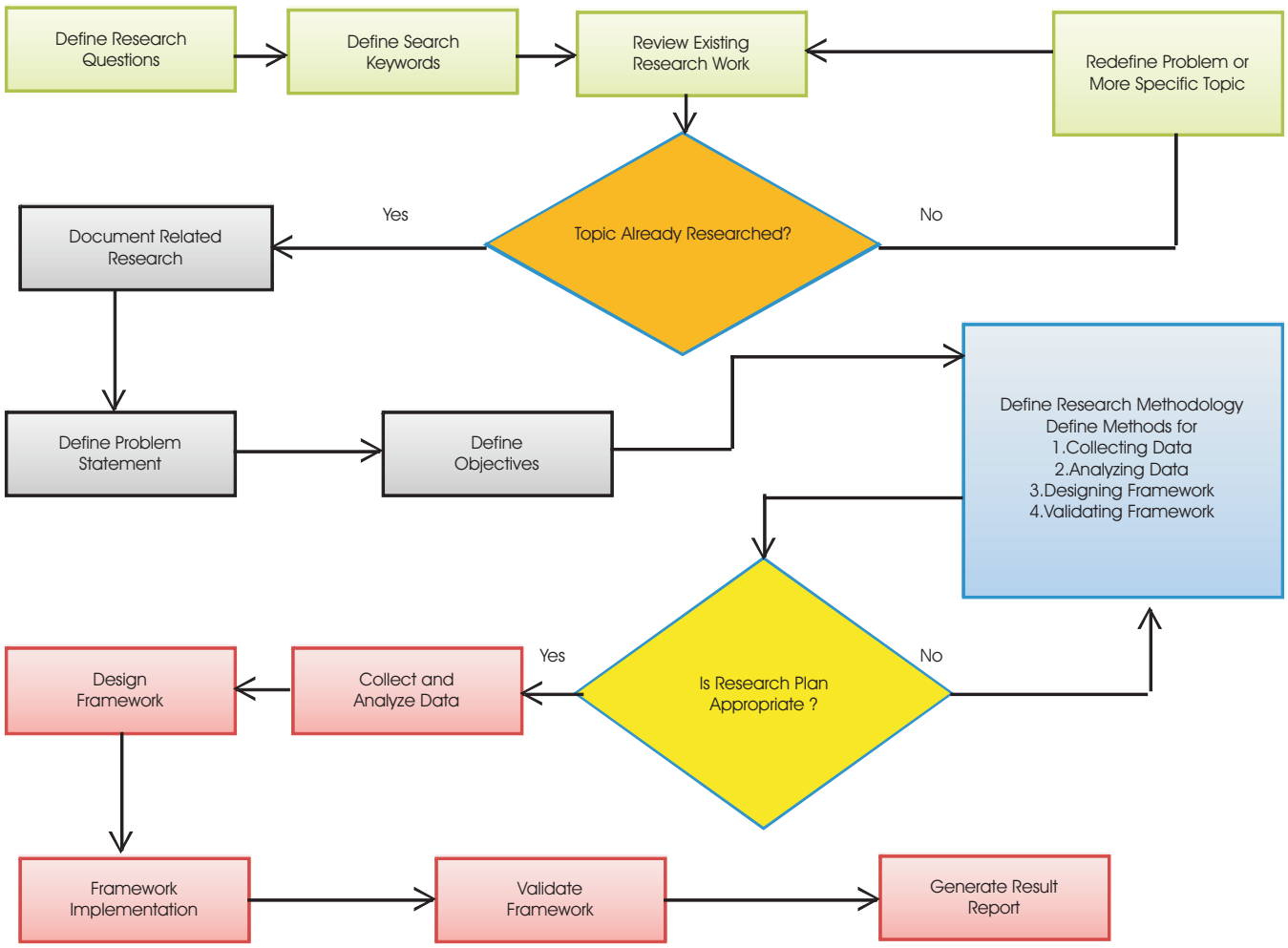

Figure 6. Research Plan

reputed Journal. The key areas discussed in this research work are:

- Writing style of an effective research paper.
- Review technique that can be used to conduct a methodical survey in a systematic manner.
- An effective research plan for forthcoming research scholars.

Conclusions

In this research paper, research experience studied from different existing literature to write an effective research paper has been presented in an effective and systematic manner. Different sections of an effective research paper has been identified, presented and described. The systematic review has implications for researchers who are looking for new concepts to write a research paper. This research paper plays an important role for those research scholars who want to start research from basic level and want to publish research work in reputed Journal. Research scholars are not effective in writing good research paper because most of today's scientists did not have the chance to undertake a formal course in scientific writing. Further, writing style of an effective research paper, a review technique to conduct a methodical survey in a systematic manner and finally an effective research plan for forthcoming research scholars has been discussed. It is hoped that this systematic study will be useful for any researcher who wants to carry forward the research in any domain.

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