CHAPTER FOUR

A GENRE BASED ANALYSIS OF I.E.E.E. AND LOCAL ARTICLE INTRODUCTIONS

4.0 Introduction

This chapter presents the findings of a genre-based analysis of the article introductions of the I.E.E.E. and LA corpora that will be considered within the framework of Swales' CARS' Model. The 3 Moves have been adapted and their respective move-steps, re-organized as in Moves 1 and 2 while all the move-steps in Move 3 have been retained as is shown in the following:

(i) Move 1, labelled as Problem Definition, will be discussed in three steps: Step 1 or Establishing Centrality, Step 2 or Literature Review and Step 3 or Establishing a Gap.

(ii) Move 2, labelled as Solution Assumption, will be discussed in one step: Step 1 or Defining Scope of Topic or Explaining Method of Investigation.

(iii) Move 3, labelled as Solution Presentation, will be discussed in four steps: Step 1 or Purpose, Step 2 or Sequence of Events/Present Research, Step 3 or Results and Step 4 or Organizational Structure.
In Move 1, Step 1 deals with the ways in establishing the gap: indicating importance, indicating interest, indicating wide application and ascribing to the characteristic of research; Step 2, which is concerned with literature review, deals with the density of referencing, the distribution of references and three types of citations and their tense implications: strong author orientation, weak author orientation and subject orientation; Step 3, in attempting to establish a gap, deals with the use of connectors and the use of negative elements and this will be supplemented by an analysis of 2 selected sample introductions as representative of the IEEE and LA corpora. In Move 2, Step 1, in defining the scope or explaining the scope of investigation, deals with the six types of compound nouns used. In Move 3, Step 1 deals with the two types of moves: purposive/teleological moves and descriptive/ontological moves used in stating purposes; as well as examines introductions opening with a third move; Step 2, in structuring the present research or the sequence of steps, deals with the types of materials used: summative, evaluative and commentative; Step 3 considers the three ways in which the results are presented and Step 4 deals with the ways in which the organization of the article is structured. The rationale behind the move or move-step is also considered.

In addition, the length, distribution and corresponding reference in publication guides of the moves/move-steps, the functions of the predominant tenses, present, past and present perfect; and modals, 'can' and 'may', in the three moves and the intensity of the active and passive voices in the use of tenses and modals in the three moves will be considered. Throughout this
chapter, wherever instances are quoted from the two corpora, the IEEE introductions will be discussed first before those taken from the LA corpus.

4.1 Move 1 - Problem Definition

This first move initiates the problem statement, the full impact of which can be built up through a delicate fusion of 3 steps: first, by establishing centrality, second, by literature review and, third, by establishing a gap. Of the 3 steps, the second step, which is literature review, is viewed as a conventional contrivance in article writing while a 'gap' is more commonly known as a 'problem' among authors. This attempt to demonstrate the relevance of the author's choice of a topic of research undertaken is prompted by the need for the author to compete with other authors for the readers' attention. Very often, the importance of the topic is explicitly shown though it may be implicitly referred to, being embedded in the introduction.

It is felt that a problem is most effectively defined in terms of 3 successive steps all of which are concentrated in Move 1; firstly, it is essential to establish the significance of the area under investigation to justify its publication; secondly, the authors have to demonstrate their background knowledge of the field and any lack or deficiency is shown up as the 'gap' that paves the way in offering a solution to the problem.
4.1.1 Rationale of Move 1 Step 1 (Establishing Centrality)

To Swales, this is an appeal to members of the discourse community for acceptance of new research as part of a lively, significant or well-established research area and in order to achieve this, the author has generally invested this step whether implicitly or explicitly, as the point of general interest that attracts attention, a lead, which is usually followed by the point of specific interest, a lead-in. This step signals the author’s recognition of a need that exists in his environment and it is subsequently formulated through his perception of the relative importance that all the people concerned with this particular problem, attach to it. For example, in the IEEE instance of BE 1, in advocating some examples of the application of time-frequency scaling transformations of the phonocardiogram (PCG), the writer would point out the importance of his research to 3 groups of people concerned - the students, the physicians and the veterinarians. Thus the rationale for utilizing this step evolves from the significance inherent in the nature of every scientific endeavour. It appears to be a popular practice for most local article authors to establish the centrality of their problem; this is on account of the fact that, in considering the technical content of the article, the referee pays particular attention as to whether 'the topic is important or interesting enough to engineers or theorists'. (Guidelines to the Publications of the Institution of Engineers, Malaysia, 1990, p.16).
4.1.2  Six Ways of Establishing Centrality

Centrality of the area of investigation is established by the authors in several explicit ways: by indicating importance, interest and wide application or ascribing to the central characteristics of research. It is found that in 29 out of 50 IEEE introductions, the centrality claims are established by asserting that the research is of significance to the discipline. In the case of the local introductions, generally, there seems to be 4 ways in which centrality of the problem may be established. These are easily recognizable through the use of certain lexemes or inflected forms like 'important', 'increasing', 'widely (used)' and 'useful'.

(i)  Indicating Importance

The 10 instances of indicating importance taken from 50 IEEE introductions are as follows:

AP 1  With such rapid growth, the most important problem for wireless communication is how to increase channel capacity.

AP 2  How to improve the robustness of STAP algorithms is a very important issue and has become the current research focus.
AP 5  This is significant because it seems to go against the general belief that OOP algorithms are substantially slower than their FORTRAN counterparts.

PS 1  Model reduction has become an important issue in the analysis of power systems, due to their constantly increasing size and complexity.

PS 1  Identifying coherent groups of generators efficiently is a crucial step in the reduction procedure, and a significant amount of research has been devoted to this problem.

AP 3  A number of recent contingencies and voltage collapses around the world has prompted a significant effort towards the study and prevention of voltage instabilities.

MTT 3  Reconstruction of phase from amplitude-only data is an important problem.

MTT 8  Since both higher accuracy and less computational efforts are always important from the viewpoint of saving time and effort for the users, continuous improvements of greater extent are called for in specific problems.
An important method in overcoming these problems is to employ induction learning from examples.

One of the central issues in studying the mechanical properties of the human arm-joints during movement using non-invasive methods is to separate the voluntary inputs and movements from the perturbation inputs and perturbed joint movements.

In 10 IEEE examples, most of which are quoted, it is found that the key lexical item is the adjective ‘important’ or ‘significant’ while there is a single reference to the adjective ‘central’. In all the instances, this adjective qualifying a noun is usually located before or after the verb, ‘to be’, and after the present perfect tense. In two instances, the same adjective is used as a complement after the verb ‘is’ or ‘are’. The frequent use of the forms of the verb ‘to be’, is or ‘are’, together with an occasional use of the present perfect tense, ‘has become’, and ‘has been devoted’, the passive form, reflects the recency of the contribution.

In the case of the LA introductions, this move-step of indicating importance constitutes the largest number of examples of establishing centrality since there are 10 instances that can be gleaned from 7 local article introductions. The following is a list of examples:
LA 1  It has become so well established that it is one of the most important and indispensable analytical tools in power systems analysis today.

LA 2  Despite this, the example presented in this paper using the borrowed data will serve to illustrate how important reliability engineering is to current planning practice.

LA 4  These fast ADC's are growing in importance with current requirements for digital processing of high frequency signals such as the wide bandwidth video signals.

LA 5  For this reason, the implementation of analog functions in MOS technology has increasingly become important in high speed digital-to-analog converters and instrumentation amplifiers.

The most important building block in any analog subsystem is the operational amplifier.

LA 16  In the fabrication of discrete semi-conductor devices, as well as integrated circuit chips, information regarding electrical properties of the starting wafer appears to be of paramount importance.

LA 18  Programmable logic arrays are very important subsystems in the design of digital integrated circuits.
Because of the regularity of their structure, PLAs can lower inventory, cut design cycles and provide highly complex circuits with maximum flexibility and hence they have become important building blocks for VLSI circuits.

The reliability of machinery is probably the most important factor in process and power plants to ensure profitable operation.

The last two decades have seen some significant improvements in the design of rotating machinery.

To show how local authors favour the use of the adjective 'important', the authors of 3 local articles have used it twice in Move 1 Step 1 of the introduction; in fact, there are a total of 8 occurrences of the qualifier 'important' as compared to only 2 instances of the noun 'importance'. Further, in dealing with their areas of investigation, the authors may attach importance to an analytical tool, device, subsystem or the reliability of machinery. The tenses used in conjunction with this way of indicating importance are mostly the present and present perfect tenses.

(ii) Indicating Interest

In the case of the IEEE introductions, there are altogether 11 instances, of indicating interest, 4 of which have been quoted below. The authors are
found to have heightened the interest that can be generated through the study of certain specialized technology in electrical and electronic engineering. The use of the lexical item ‘interest’ or ‘interesting’ is the key signal in the following examples:

MTT 6  *In recent years, the possibility of manufacturing biaxotropic reciprocal materials (generally known as chiral media) at microwave and millimetric frequencies has raised a great theoretical and technological interest.*

BE 10  *The study of the biomechanics of locomotion provides very extensive and interesting material for designing various aids for the handicapped and for investigating the involved physiological processes and neural mechanisms controlling the system.*

PS 3  *The study of power systems dynamics phenomena and their control is made all the more interesting by the variety of transient processes which occur.*

AP 2  *With the availability of ever-improving phased - array antenna and advanced digital signal processing technology, there has been a renewed interest in STAP since the late 1980's.*

In the above examples, the use of the present tense in the active form as in ‘provides’ and ‘can’, and the present tense in the passive form as in ‘is
made', coupled with the use of the present perfect tense as in 'has raised' or 'has been' is to reinforce a sense of current issues.

To ensure that their investigation is of interest and value to the other engineers, the local authors may trace rising trends in the demand or capacity of a power system, or in certain phenomena. The following is a list of 5 examples, indicating number or quantity, that are taken from 4 local article introductions:

LA 3 Thus there is a growing demand for a power system with high reliability.

LA 7 Public awareness in medical care has escalated in the last decade.

LA 7 The increasing number of private clinics and specialist clinics is a good indicator of these phenomena.

LA 10 Since transoceanic communications cable began in 1866, the total capacity of international coaxial submarine cable systems has increased with time.

LA 20 The art of solving these equations using a numerical technique, which is known as Computational Fluid Dynamics (CFD) has been an active area of research for the last three decades.
In the above LA examples, the present or present perfect tenses are mostly used. In the instances where the present perfect tense is used, the time element is also explicitly indicated while in the case where the present tense is used, the noun phrase carrying implications of an increase in time or volume, is subject or object of the verb 'is'.

(iii) Indicating Wide Application

It has been found that the IEEE authors, in 15 instances claim that certain technologies, techniques or devices are widely used for some specific purposes such as those quoted. A variety of lexical items are used here such as verbs like 'used', 'applied', 'adopted' and adjective like 'many', and 'frequent' as well as the adverb 'widely'. The following is a list of IEEE examples indicating wide application:

AP 4  *Anisotropic media are widely used in a variety of applications such as ionospheric research, crystal physics, integrated optics, geophysical exploration, reciprocal and non-reciprocal microwave and millimetre wave devices.*

PS 9  *The most frequent optimization techniques to solve these models have been the branch and bound ones.*

BE 2  *Time-frequency scaling techniques have been widely applied to the speech signal to compress its frequency bandwidth for transmission*
or to provide an aid for people with impaired hearing (shift the speech signal into an audible frequency range).

BE 9 Novel wireless technologies have been very widely adopted for routine communications usage in our society.

BE 5 In clinical practice, devices that apply electrical stimulators to muscles most commonly use electrodes placed on the skin to deliver the stimulus pulses.

MTT 8 Cylindrically symmetric cavities are utilized in many radio-frequency (RF) devices, such as klystrons, RF guns and various accelerating structures in particle accelerators.

As in the case of the other two functional categories, it is evident from the above examples that the use of the present perfect tense in the passive form: 'have been', 'have been applied' and 'have been adopted' is a popular choice of tense. An equally popularly used tense is that of the present tense in the active form 'apply' and 'use', and the passive form as in 'are used' and 'are utilized'.

The fact that a certain device or method is used by a large number of people is yet another way of indicating centrality by the local authors. To illustrate this way of establishing centrality, 4 examples of indicating wide application found in 3 LA introductions are listed as follows:
LA 5  The field of analog MOS integrated circuit design took off about ten years ago, following quick and wide industrial adoption of certain circuit developments in the mid-seventies.

LA 14  Switched mode converters are widely used today in electrical and electronic equipment.

LA 20  Because of this advantage, the methods are now widely used for the analysis of a wide range of engineering flow problems.

LA 20  The time-marching methods which are widely employed in the fluid flow problem...

It can be seen from the above examples that the passive form of the present tense with no mention of the agent is mainly employed. Besides, the adverb 'widely' appears to be preferred to the adjective 'wide' in expressing centrality here.

(iv)  Ascribing to the Characteristic of Research

An explicit means of asserting centrality is by ascribing to the central characteristic of the issue. In other words, the authors demonstrate their ability
to abstract in extracting essential features of complex engineering problems.

Such IEEE examples are conveyed as in the following:

AP 5  The complex natural resonances (CNR's) of an immersed dielectric
sphere were investigated because of the available exact solution.

MTT 10  A variety of numeral schemes with the TVD property have been
successfully used in CFD's to find solutions containing
discontinuities with remarkable accuracy.

MTT 4  Since it is awkward to characterize the devices in frequency
domain, time-domain analysis, is well-suited for analyzing such
system characteristics.

NS 10  Beta-sensitive probes offer considerable promise for use in radio-
guided intra-operative localization of tumors.

AP 2  Airborne early warning radar is very useful for the detection of
small radar cross-section (RCS) targets in severe clutter.

BE 7  Identifying the mechanical properties of the human
neuromusculoskeleton system under normal conditions is
challenging because of the time-varying nature of the system,
nonlinearities, unsensed voluntary inputs and adaptations of the
central nervous system.
From the examples given it is clear that exactness is one of the desired attributes, while a generalized positive implication is carried through attributes such as suitability, utility and promise, as opposed to a rare specification of time variance.

Ascribing to the characteristic of research is the least popular way of establishing centrality among the local authors, as there are only 3 instances of ascribing to the characteristic of research found in the entire LA corpus. This is probably due to an implicit understanding of the utility value of the research among the specialist readers. The examples are as follows:

**LA 9** This special property very often, is *extremely useful in the identification and the study of non-linear system.*

**LA 13** Among these schemes, the basic or direct inverse model neuro-control scheme is perhaps one of the more viable techniques for real-time control implementation due to its *simplicity.*

**LA 19** The *reliability of machinery is extremely essential in the power generation and petrochemical industries where emergency shutdown of a few hours duration has severe economic repercussions.*
Thus it can be seen that some of the criteria used by the local authors in ascribing characteristics to their subject of investigation are utility, simplicity and reliability.

(v) **Claiming Increase in Number or Quantity**

Yet another way of asserting centrality is by claiming an increase in the number of researchers, or quantity in demand for the product related to the research area as in the following 2 IEEE instances:

**AP 7** Demand for wireless communications has grown exponentially during the last five years. With such rapid growth the most important problem for wireless communication is how to increase channel capacity.

**MTT 5** With the falling costs associated with on-wafer radio-frequency (RF) measurements fueled by the rapid rise in demand, an ever increasing number of MMIC design groups are establishing their own in-house MMIC test facilities.

It is noted that has not been found a single example of making such claims in the increase in number or quantity of research among the local authors. This may be due to the fact that engineering science is not as competitive as in the West in terms of growth and development.
(vi) Claiming a Number of Investigators in Research Area

The final way in connection with establishing centrality is that of claiming a number of investigators as in the following 3 IEEE instances:

AP 6  *In the last decades a large amount of work has been devoted to the characterization of radiating systems by means of near-field far-field transformation techniques.*

MTT 6  *The effect of bi-iso/anistropic media on the guided electromagnetic propagations and antenna has aroused the interest of many researchers.*

NS 6  *Optical fibres, in particular, are the subject of many investigators with respect to the influence of radiation on their transmission characteristics.*

Here again, there is no instance of any local authors making such claims of a number of a number of investigators in a research area as their Western counter-parts appear to be more in the fore-front of cutting edge science. From the preceding discussion earlier on, it is seen that the IEEE authors assert centrality in a wide diversity of ways in order to capture the attention of an audience. It is interesting to note that these may be regarded as
methods of persuasion that will help authors ‘sell’ their work to the prospective readers.

4.1.3 Frequency of Establishing Centrality

In sum, all the 6 means of asserting centrality have been tabulated below:

**Table 4.1**
Frequency of Establishing Centrality (IEEE)

<table>
<thead>
<tr>
<th>Ways of Establishing Centrality</th>
<th>Found in No. of AP Introd</th>
<th>Found in No. of BE Introd</th>
<th>Found in No. of MIT Introd</th>
<th>Found in No. of NS Introd</th>
<th>Found in No. of PS Introd</th>
<th>Found in Tot. No. of I.E.E.E. Introd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indicating interest</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>11 (14.3%)</td>
</tr>
<tr>
<td>2. Indicating importance</td>
<td>4</td>
<td>3</td>
<td>10</td>
<td>2</td>
<td>10</td>
<td>29 (37.7%)</td>
</tr>
<tr>
<td>3. Ascribing to characteristic of research</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>16 (20.8%)</td>
</tr>
<tr>
<td>4. Indicating wide application / demand</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>16 (20.8%)</td>
</tr>
<tr>
<td>5. Claiming increase in no. / quantity</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>6. Claiming no. of investigators in research area</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>3 (3.8%)</td>
</tr>
<tr>
<td>Total No. of I.E.E.E. Introd</td>
<td>14</td>
<td>11</td>
<td>21</td>
<td>9</td>
<td>22</td>
<td>77</td>
</tr>
</tbody>
</table>
As can be seen from Table 4.1, the MTT introductions, closely followed by the PS introductions, use Move 1 Step 1 more intensively than in the case of the other 3 introductions, AP, BE and NS. This may be attributed to a greater need to establish centrality in a more mature technology in which many attempts of investigation have already been carried out. Moreover, in the newest of the sub-disciplines, like biomedical engineering, the novelty of the investigation may allow a less conventional presentation of the research that does not require the author to establish any centrality at all. In addition, authors, in general, appear to favour the method of claiming importance in this move-step. Of almost equal popularity in use are the methods of ascribing to the characteristic of the research, and those of claiming wide application. This may be due to the choice of vantage points from which the authors are able to see their situations and to bring into focus a definition of the real problem that in turn will bring about the most satisfying result to the identified need.

**Table 4.2**

*Ways of Establishing Centrality (LA)*

<table>
<thead>
<tr>
<th>Ways of Establishing Centrality</th>
<th>Found in No. of LA Introd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indicating interest</td>
<td>-</td>
</tr>
<tr>
<td>2. Indicating importance</td>
<td>10 (50%)</td>
</tr>
<tr>
<td>3. Ascribing to characteristic of research</td>
<td>3 (15%)</td>
</tr>
<tr>
<td>4. Indicating wide application / demand</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>5. Claiming increase in no./ quantity</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>6. Claiming a number of investigators in research area</td>
<td>-</td>
</tr>
</tbody>
</table>
In sum, in the case of the local article introductions, only 4 out of the 6 ways of asserting centrality, as in the I.E.E.E. introductions, have been found and are thus tabulated.

4.2 Rationale of Move 1 Step 2 (The Literature Review)

In its most elementary sense, the function of this step can be interpreted as one of supplying sufficient background information practice in referencing (Garvey, 1994,p.14) that would help the reader to understand and evaluate the result of the present study without having to refer to any previous publications on the topic. However, in recognizing this step to be an 'obligatory' one, Swales is actually alluding to the role of scientific communication as when in reviewing literature, the research subject is introduced within the context of the knowledge-making of the disciplinary community - a point noted by MacDonald (1992,p.549). The content of this move-step comprises the background which may be a historical account of the current problem or previous work by other researchers in a similar area of investigation. The extent to which authors make references appears to have a direct bearing on the maturity of the technology intrinsically bound up with the sub-disciplinary types in electrical and electronics engineering. This would imply that the more mature the technology, the greater is there the need to make citations as a lot of grounds would have been covered by many other authors before the most current author breaks even newer ground. It is for this reason that we find a superfluity of references in one introduction as compared to the relative
superfluity of references in one introduction as compared to the relative sparsity in another. However, it is not uncommon for authors to quote their own work either to promote themselves or to fill a void. This section considers the quantifiable items such as the 3 orientation types of citations: strong author, weak author and subject orientations, the distribution of references as per introduction, as well as the number of references as per sentence in the IEEE introductions.

4.2.1 Density of Referencing

Although literature citation is a formal requirement in journal article writing, Cooper (1985) found that 26.7% of the I.E.E.E. publication introductions did not bear any literature citation. To investigate whether such exceptions do exist in the corpus in this study, and to account for the presence of citation, it is needful to look at 3 samples taken from the I.E.E.E. corpus - NS7, NS2 and PS10.

In NS7, the thickness of citations, which comprises 17 sources of references spreads over 4 sentences in the following example, may be attributed to the fact that the problem has been investigated many times and that the findings of various investigations have subsequently revealed inadequacies. Thus the author is justified in presenting a more comprehensive review to substantiate his pursuance of the same line of research. This effect is achieved in NS7 as we can easily pick out a marked pattern in which the Move
mention the main points that have emerged and which are relevant to his own investigation. Interestingly, the sentence ‘In one attempt, flood transmission source and emission data were collected simultaneously from a single parallel-collimated detector[9]’ is termed a ‘summary’ by Jacoby (1987,p.55) and is not considered a citation according to Swales.

In this work we present the performance of a YSO/LSO block detector module for possible use in an imaging device capable of both single and coincidence photon detection. The assumption is that this detection module would allow the construction of a combined SPECT/PET imaging system with better count rate performance in the coincidence mode compared to current dual headed scintillation cameras. The goal is also to achieve a spatial resolution in the SPECT and planar imaging modes which is close to that of conventional single photon systems. In previous work [1], we have shown that a YSO/LSO phoswich detector could potentially be used in a block detector configuration. Both of these scintillation materials have enough light output to allow accurate detector element identification, even at the low photon energies used in conventional nuclear medicine (e.g., 140 keV).

In yet another example, PS10, there appears to be a noticeable lack of reference to literature, the reason for which, the author professed, has been due to the current lack of ‘off-the-shelf data and analysis tools’. Despite this, the introduction appears to be an original one as it does provide background
information on the MIT Energy Laboratory, and in this way, it generates its own original background information. Moreover, the novelty of the undertaking, that is, wind-power analysis, may account for the doing away with a conventional obligation, the use of citations.

PS 10. Renewable energy technologies differ from more convenient thermal generators in that their resource, such as solar insulation or wind, is intermittent and cannot be controlled. Such non-dispatchable power generators cannot be modeled or analyzed in the same manner as conventional power plants, thus an alternative methodology must be employed for determining their usefulness and overall effect on the power system, in terms of system reliability and environmental and economic impacts. The Analysis Group for Regional Electricity Alternatives (AGREA), the MIT Energy Lab, works with New England electric utilities, environmental groups, regulators and industry, to obtain mutually acceptable, long-range strategies for meeting the region's future electricity demand.

In the case of the local introductions, there seems to be a semblance of the findings of this study with that of Cooper (1985) in that 25% of the local publication articles do not carry any literature citation as compared to 26.7% of such articles in Cooper's study. A closer examination of three sample introductions, LA 6, LA 15 together with LA 17 will help to illuminate this absence or presence of citations.
The switching operations for restoration of supply after every occurrence of forced outage on the system, are fully modeled so that the outage duration of each event can be more realistically quantified to give a measure of the mean duration of the outage of a feeder. The other four reliability indices can be deduced based on the reliability concepts. Preventive maintenance can increase the in-service availability of the electrical equipment and in practice maintenance on each substation is done according to a planned schedule. Computational efforts are carried out to model such maintenance practice.

The studies are extended to include considerations for network changes. Various simulations of changes on feeders are carried out to assess the effects of each alteration on the reliability of distribution system. Among the assessments are:

1) Simulations of single radial feeder with each having a single source of alternative supply. The reason for inclusion of this type of feeders in these assessments is due to the fact that such feeders exist in great number in practical distribution systems.

2) Simulations of consumer-oriented networks, i.e. feeder networks having haphazard topologies due to the tendency of
Throughout these assessments, the relationship between the number of sources of alternative supply and the reliability of distribution system is sought in addition to the search for the most reliable feeder.

It can be clearly seen in the above sample introduction that not a single citation is found in the entire introduction; this is due to the fact that the reference made to Walker, whose techniques the author seeks to modify, has been mentioned in the abstract despite the fact that the introduction appears to be a more suitable place for the insertion which can assume the form of a citation

LA 15 Spectral techniques are widely used in digital circuit testing [6]. The circuit may be characterized by a spectral transformation and faults will cause changes to occur in the spectral coefficients. The aim is to obtain a minimum set of spectral coefficients termed a signature to detect all faults that may affect a circuit. The attention so far has primarily been on Walsh transforms [6] [10], though recently there has been renewed interest in using Reed-Muller coefficients [1] [2] [8] for this purpose. As outlined in [1], the RM coefficients offer some advantages over Walsh coefficients, both in terms of hardware for generating the coefficients and their storage as a signature, so that they offer an attraction for built-in automatic testing.
The properties of RM coefficients are well-known and have been studied extensively [3] [4] [7] [9] [11].

The higher psychological state of the human mind like insight, self awareness, intuition, artistic appraisal are still a mystery and some interesting and controversial views are expressed by R. Penrose [1] in his book 'The Emperor's New Mind'. The book 'Cosmic Blueprint' by Paul Davis [2] offers some further views by other researchers.

In order to understand the lower cognitive functions of the brain, various models were formulated and proposed. The best known models were that of Hodgkin and Huxley [3]. Various researchers have come out with different variations of neural models exhibiting interesting properties. Some of the models that have been extensively studied are: [4] [5].

A comparison of LA 17 and LA 15 reveals the fact that the techniques in LA 15 have been the subject of extensive studies whereas the phenomena and models mentioned in LA 17 cannot be deemed to be as equally well received or researched. Thus there is a relatively much larger number of citations in LA 15 than in LA 17.
4.2.2 Distribution of References

Since the degree to which citations are made varies from author to author, it would be interesting to find out the distribution of introductions according to the number of references made. It must be pointed out that in the attempt to do this, care has been taken to avoid the counting of the same reference source more than once. The findings are tabulated as following:

**Table 4.3**

Frequency Distribution of Introductions as per Number of References per Introduction (IEEE)

<table>
<thead>
<tr>
<th>No. of References per Introduction</th>
<th>Found in No. of AP Introd.</th>
<th>Found in No. of BE Introd.</th>
<th>Found in No. of MTT Introd.</th>
<th>Found in No. of NS Introd.</th>
<th>Found in No. of PS Introd.</th>
<th>Total No. of Introd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>15 (30%)</td>
</tr>
<tr>
<td>6 - 10</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>12 (24%)</td>
</tr>
<tr>
<td>11 - 15</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>15 (30%)</td>
</tr>
<tr>
<td>16 - 20</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3 (6%)</td>
</tr>
<tr>
<td>21 - 25</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>26 - 30</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2 (4%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>50 (100%)</strong></td>
</tr>
</tbody>
</table>
It can be seen from the table above that 84% of the introductions are found to have included 1 to 15 references in making citations. Only 4% of the I.E.E.E. corpus carry no citations in the introduction section of the articles. Thus this indicates that on the whole, the authors of the I.E.E.E. introductions do adhere to the convention of citing literature in knowledge-making.

Further, recording the number of introductions bearing a certain number of references in a single sentence (irregardless of the fact that previous mention has been made of a particular citation in the same introduction) would help to enlighten us on the authors’ preferences in making citations. The findings are tabulated below:

Table 4.4
Frequency Distribution of References as per Sentence in Move 1 Step 2
(I.E.E.E.)

<table>
<thead>
<tr>
<th>I.E.E.E. Introd.</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
<th>R10</th>
<th>R11</th>
<th>R54</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP</td>
<td>25</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BE</td>
<td>37</td>
<td>16</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MTT</td>
<td>29</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>NS</td>
<td>21</td>
<td>12</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PS</td>
<td>21</td>
<td>18</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOT.</td>
<td>133</td>
<td>59</td>
<td>31</td>
<td>8</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(%)</td>
<td>51%</td>
<td>22.6%</td>
<td>11.9%</td>
<td>3.1%</td>
<td>4.6%</td>
<td>3%</td>
<td>1.5%</td>
<td>1.1%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>
As can be seen in table 4.4, the majority of the references in all the 5 I.E.E.E. sub-disciplines carry a single citation though 2 to 3 references per reference point is also a common feature in this I.E.E.E. corpus. However, an exceptionally rare instance is that of a single reference point with 54 references - this perhaps illustrates the fact that the number of references an author can make in a single instance is a matter of the individual’s preference.

<table>
<thead>
<tr>
<th>Range of References Per Introduction</th>
<th>No. of LA Introductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 5</td>
<td>11 (55%)</td>
</tr>
<tr>
<td>6 – 10</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>0</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Total</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

The distribution of introductions in accordance to the number of references made is determined, taking care to avoid the counting of the same reference more than once. As is evidenced from the table above, more than half of the total number of the introductions are found to have borne 1 to 5 references while a quarter of the corpus does not carry any citations. These
references while a quarter of the corpus does not carry any citations. These trends indicate that the local authors are generally not inclined towards making profuse citations in practice.

<table>
<thead>
<tr>
<th>No. of References Attached</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Introductions</td>
<td>11</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>(45.8%)</td>
<td>(29.2%)</td>
<td>(12.5%)</td>
<td>(4.2%)</td>
<td>(4.2%)</td>
<td>(4.2%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Here again, the number of introductions to which a certain number of references in a single sentence is attached, is recorded to determine the author's preferences in making citations. As is evidenced from Table 4.6, the most popular citation adopted by the local authors is that which carries 1 to 2 references per reference point. It is noted that there is a single reference point to which the maximum of 7 references has been made.

4.2.3 Three Orientation Types of Citation – Strong / Weak Author and Subject

There appears to be three ways by which authors express citations and they are shown in Table 4.7 on the following page.
### Table 4.7
Three Orientation Types of Citations in Move 1 Step 2 (I.E.E.E.)

<table>
<thead>
<tr>
<th>Orientation Type of Citation</th>
<th>Structure</th>
<th>AP Introd.</th>
<th>BE Introd.</th>
<th>MTT Introd.</th>
<th>NS Introd.</th>
<th>PS Introd.</th>
<th>Total (%)</th>
<th>Preferred Tense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong Author Orientation</td>
<td>a. R as Subject of Verb</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>15 (9.8%)</td>
<td>Past Tense</td>
</tr>
<tr>
<td></td>
<td>b. R as Object of Verb</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>9 (5.9%)</td>
<td></td>
</tr>
<tr>
<td>Weak Author Orientation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3 (2%)</td>
<td></td>
</tr>
<tr>
<td>Subject Orientation</td>
<td>a. X can be the Case (R)</td>
<td>1</td>
<td>10</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>25 (16.3%)</td>
<td>Use of ‘Can’ Tense</td>
</tr>
<tr>
<td></td>
<td>b. X is the case (R)</td>
<td>12</td>
<td>29</td>
<td>28</td>
<td>15</td>
<td>17</td>
<td>101 (66%)</td>
<td>Present Tense</td>
</tr>
<tr>
<td>TOTAL (%)</td>
<td>-</td>
<td>21</td>
<td>47</td>
<td>33</td>
<td>22</td>
<td>30</td>
<td>153 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

According to Swales, there are 3 ways of making citations: first, the strong author orientation in which reference to the individuals concerned is expressed as the subject or the agent, second, the weak orientation type in which the names of the individuals are placed in the brackets within or at the end of the sentence, and third, the subject orientation type in which a number is inserted within square brackets to indicate a parenthetical reference to an individual’s work. Very often, authors follow the dictates of the publication
individual's work. Very often, authors follow the dictates of the publication guides in their choice of an orientation type of citation. The 3 types of citations and their distribution are shown in Table 4.7.

(i) **Strong Author Orientation**

In the I.E.E. introductions, in 35 out of 106 cases of citation, specific references are made to the authors. 10 of the 14 cases in which the author is mentioned as the subject are listed as follows:

**AP 5** Ashkin [6] has shown experimentally that these creeping waves are launched by grazing incident rays.

**AP 5** Fallen and Bryant [7] also provided an astonishing visualization of surface waves on water droplets.

**AP 5** Franz and Beckmann [9] also studied the creeping waves for objects of finite conductivity.


**BE 10** Yu, Chen and Durand [10] also evaluated the damped sinusoid model by using the mean filter of forward and backward predictor
Jansen [1] has concluded that the dispersion modeling becomes extremely involved if the physical parameters of microstrip-like lines exceed four.

Using the concept of the single-layer reduction (SLR) formulation, Verna and Hanani developed a unified dispersion model [2] for the shielded/unshielded multilayer microstrip line.

Christian et al, utilized surface barrier detectors to measure tracer kinetics in exposed canine hearts by detecting positrons emitted by 62 Cu-PTSM [9].

Neyer, Wu and Imhof [4] argue that the use of conventional computer languages often leads to inflexible code which is costly to maintain and to adapt to the very specific needs and changing requirements of each utility.

To reduce the truncation of the transmission projections, Jaszczak et al [6] have used longer focal length fan-beam collimators [110cm].

10 of the 21 cases in which the author is mentioned as the agent following 'by' are listed as follows:
For instance, a pole-zero model (or autoregressive moving average model) was used by Joo et al [5] for the reconstruction of the second heart sound in patients with a bioprosthetic heart valve implanted in the aortic position.

Another method proposed by Koymen is the damped sinusoid model [6] which was used to study the power spectra of the first heart sound produced by mechanical prosthetic heart valves implanted in the mitral position.

Non-linear models of electricity stimulated muscle have been reviewed by Durfee [3].

Replacement of the composite-substrate microstrip line by an equivalent permittivity of a single substrate has also been suggested by Finley et al [3].

A floating gate MOSFET dosimeter offering for lower sensitivity than the devices reported here has been described previously by Kassabov et al [5].

A device similar to that of Kassabov et al was proposed earlier in a U.S. patent by Knoll et al [6].
NS 5  Operation under applied bias of a dosimeter similar in structure to that described here has been reported by Peters et al [7].

AP 8  The model has been adopted for analyzing very high frequency (VHF) and ultra high frequency (UHF) radio-waves propagation through and scattering by forest foliage by Li [5].

AP 8  The extensively detailed investigation and comprehensive discussion on the mechanism, property, and derivation of lateral waves can be found in the specialized monograph written by King, Owens and Wu [16].

Observations

a)  All of the instances in the strong author orientation type of citations employ what Fraser (1974) called performative verbs, so called because of their semantic characteristics. Examples of performative words have been taxonomically listed as follows:

(i)  The verbs of asserting consist of ‘argue’ (PS5), ‘conduct’ (MTT()), ‘report’ NS5) and ‘suggest’ (BE9);

(ii)  The verbs of evaluating consist of ‘conclude’ (MTT9), ‘describe’ (NS5), evaluate (BE1), ‘examine’ (BE1), ‘test’ (BE1) and ‘review’ (BE3).
(ii) The verbs of stipulating consists of 'introduce' (AP7, AP6), 'derive' (AP5), 'employ' (AP7), 'use' (AP5, NS7), 'utilize' (NS10), 'develop' (MTT9), show' (AP5, BE5), 'provide' (AP5), 'discuss' (AP5), 'study' (AP5), 'include' (BE2), and 'investigate' (BE3).

(iv) The verb of suggesting is 'propose' (BE10, NS5, AP8).

(v) The verb of committing is 'assume' (AP8).

(vi) The verb of legitimizing is 'adopt' (AP8).

Thus, it can be seen that, pertaining to the IEEE introductions, there is predominance of performative verbs of the stipulating type whose function is to indicate intent of the author or to announce what the author is doing. The purpose in using verbs of evaluating is to indicate the objective assessment of the truth of the proposition, while the verbs of asserting indicate the strength of conviction of the truth of the proposition. In contrast to these three types of performative verbs, there is a dearth of the verbs of suggesting, committing and legitimizing.
Table 4.8
Tenses Used in Citation with the Author as the Subject (I.E.E.E.)

<table>
<thead>
<tr>
<th>Tense</th>
<th>No. of instances in AP</th>
<th>No. of instances in BE</th>
<th>No. of instances in MTT</th>
<th>No. of instances in NS</th>
<th>No. of instances in PS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present (A)</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Past (A)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Present Perfect (A)</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>14</td>
</tr>
</tbody>
</table>

b. The reporting verb in the instances where the author is mentioned as the subject are mainly in the past tense in the active form as shown in Table 4.8.

In these cases, the Move-Step is usually followed by a gap. Thus, the truth of the proposition made by the cited authors remains the truth until the imposition of a gap. In other words, the applicability of the current authors' findings does not extend beyond the gap. In contrast to this, the reporting verb in IEEE instances where the author is referred to as the agent following 'by' (Table 4.9) is mainly in the present perfect tense in the passive form.
The use of the present perfect tense is to indicate a link, the fact that the applicability of the cited authors’ findings in the past stretches into the present research.

The rest of the discussion will consider examples of local article introductions according to the 3 types of orientation: strong author; subject and weak author orientations. This is to determine the extent to which each of these orientation types is frequently or infrequently used by the authors.

The following is a list of 10 LA examples of the strong author orientation type:

LA 1  *In the late 1960s the phase coordinate method as it came to be called was firmly established by the publications of Laighton*[^6].
The method based on the conditional probability approach was first reported by Billinton and Bhavaraju\textsuperscript{3,6}.

Allan\textsuperscript{4} also used a D.C. load-flow and introduced useful ways for reducing the computational requirements.

Widrow (1987) suggested that in order for the neural network to learn a function well, the number of training patterns has to be ten times of the number of weights in the network.

The best known models were that of Hodgkin and Huxley [3].

Wu (1952) showed that the general three-dimensional flow within a turbo machine can be reasonably described by a combination of two-dimensional solutions in two different planes.

Ila and Reddy [1] have suggested a pseudo-exhaustive method using a product term and input grouping scheme in a divide and conquer strategy.

Reddy and Ila [4] have used pass transistors on each decoder line and a similar suggestion is used in [5]; however the methods of [4] and [5] lead to complex test generation as opposed to [2].
The higher psychological state of the human mind like insight, self-awareness, intuition, artistic appraisal is still a mystery and some interesting and controversial views are expressed by R. Penrose [1] in his book 'The Emperor's New Mind'.

The book 'Cosmic Blueprint' by Paul Davis [1] offers some further views by other researchers.

Khakbaz [2] uses a shift register and an extra output line to control each product term; a proposal along the same lines is advanced in Fujiwara [3].

Out of a total of 13 examples of Move 1 Step 2 found in the LA corpus, there are 6 instances expressed in the active and passive forms of the past tense, 5 instances in the active and passive forms of the present tense and 2 instances in the present perfect tense. This shows that this move-step is conveyed mainly using the present and the past tenses. However, it is noted that only the verb which is after the subject is expressed in the past tense to indicate a reported action in the past while the verb in the 'that'-clause is usually in the present tense to indicate the universality of a scientific fact that is linked to the author's reported action. In addition, the use of the present perfect tense suggests a recent event that is being reported.
(ii) Subject Orientation

In the non-integral referencing, the present tense is mainly used to define a large number of sentences; 5 of the 10 IEEE instances of the subject orientation type are listed as follows:

MTT 2 However, if the leaky mode is physically meaningful, the leaky mode fields are expected to agree with the actual fields within a limited angular region of space determined by the leakage angle [13], [14].

BE 10 Systems of this type employ a top-down, divide-and-conquer strategy that partitions the given set of objects in smaller and smaller subsets in step with the growth of the decision tree [10].

MTT 4 In these applications, lumped elements are treated as sub-grid models on an FDTD grid [2], [3], [8] or SPICE lumped circuits [4], [6], [7] are used to allow direct access to all SPICE models (via SPICE itself) for simulation of lumped circuits in FDTD calculations.

NS 6 Nuclear industry shows an ever growing interest in the possibilities offered by photonic technology [1, 2].
Diagonal loading or noise injection [9] is a simple and effective way to remedy the pattern distortion caused by the covariance matrix estimation errors.

In the quoted IEEE examples, the present tense in the active or passive form, is consistently used after the subject whether in the main or subordinate clause. This may be attributed to the basically universal character of scientific expository statements. It is evident that there has been no instance in presenting statements of this kind that the past tense is ever used. Neither has there been even a single instance in which the perfect tense is used.

In the case of the LA introductions, examples of the subject orientation type may be expressed in the active or the passive form. The 17 instances of the subject orientation type of the non-reporting style of referencing are quoted as following:

LA 1 The method of symmetrical components for the analysis of unbalanced polyphase network was established a long time ago and is still the most widely used method till this present day.

LA 1 Unlike the symmetrical component method which involves the transformation of variables, methods based on the primary or untransformed frame of reference started very much later.
LA 2 The planning and operation of modern electrical power systems requires an assessment of the quality of the system\(^1,2\). In this respect reliability engineering has become an important and indispensable tool\(^3,4\) for power system designers and planners which has enabled them to predict the future performance of their system using past records.

LA 3 Composite system reliability evaluation entails the application of the frequency and duration technique like that in distribution system analysis but the mathematical basis is that of the conditional probability approach.

LA 4 There are many techniques of analogue-to-digital conversion (ADC) ranging from the simplest ramp conversion technique to the high-performance ratio-independent algorithmic converter \([1]\) or the self-calibrating converter \([2]\).

LA 5 The main developments were the precision-ratioed capacitor array, the internally compensated MOS operational amplifiers, and the use of such circuits in novel analog-to-digital converters, PCM CODECs, and switched-capacitor filters \([1]\).

LA 5 A multitude of applications awaits further advances in MOS analog integrated circuits (IC) including signal processing (especially high
frequency and low power), digital transmission, retrieval and storage, high frequency reception, sensor applications, and possibly even artificial intelligence [2].

LA 5 With such a small size, and low power consumption, using 20 to 30 op amps in a single chip is not at all uncommon [3].

LA 8 The computer simulation of the process steps involved in the fabrication of microelectronic devices has emerged as an important aid to the design and development of such devices [1].

LA 9 The non-linear nature of a system input-output relation may show itself through performance degradation, limit cycle excitation or loss of stability for large input signals [5].

LA 9 The recent introduction of the NARMAX (nonlinear Auto Regressive Moving Average model with exogenous input) model [4] provides an alternative representation for nonlinear systems which maps past inputs and outputs into the present system output. This considerably reduces the computation burden and excessive parameter set associated with the functional series [6]. Although there are several parameter estimation algorithms based on least squares and the prediction error routine [4] available for the estimation of NARMAX model, an orthogonal least square estimation algorithm [4] also
provides information regarding the significance of the estimated parameters in the model.

LA 14  Because of the fast Mostet current fall time during turn off, the overlap of falling current and rising voltage is lesser compared to using bipolar transistors hence resulting in low switching losses [1] and eliminates the need for snubbers in this design.

LA 15  Spectral techniques are widely used in digital circuit testing [6].

LA 16  If one sets the two frequencies equal, a dc Hall voltage will result [2].

  The Hall sample acts as a linear mixer of the current (at frequency \( f_1 \)) and the magnetic field \( B \) (at frequency \( f_B \)) through the vector cross product \( l \times B \) of the Hall voltage, which has a component at the sum \( f_s = f_1 + f_B \) and the difference \( f_\Delta = f_1 - f_B \) frequencies [3].

  As can be inferred from the above examples, the subject of the verb may deal with a model, technique, method, application, computer simulation or a system. Judging by a total of 8 instances of the use of the present tense as compared to 3 instances of the past tense, it is clear that the former is the predominant tense. Moreover, this way of referencing appears to be the approach most popularly favoured by the local authors since it can be found in 10 articles introductions.
There are 13 LA instances of subject oriented references using reporting verbs and they are listed as following:

LA 1 Since these early works appeared a considerable amount of work has been done in improving or advancing the state of the art\textsuperscript{2}

LA 2 Considerable work\textsuperscript{4, 6} has been done in improving the available techniques in reliability evaluation especially on the generation side that almost accurate prediction of the performance of a real system is now possible.

LA 2 As a result, outage data for electrical components such as lines, transformers and circuit breakers have been obtained from other sources\textsuperscript{1}.

LA 3 Compared with the generation or transmission systems studied separately, reliability evaluation of composite systems has fewer publications and has gained attention fairly recently\textsuperscript{3, 4}.

LA 4 For further detailed analytical discussion on the subject the reader is referred to the literature [3, 4].

LA 4 A solid-state 8-bit flash ADC on a single chip with a fast minimum sampling rate of 100 MHz, for example, that can meet such requirements has since been fabricated [5].
As a consequence, very few real systems have been identified [6].

Although theoretical analysis of frequency response estimation has been considered [1], yet practical attempts have been limited to the first order and the second order terms were zero.

In this paper, the design equations of the neural network are written as a constraint satisfying network [2] and the states are allowed to evolve after exposing the network to external excitation, which yields 'useful' (converging) state trajectories.

The attention so far has primarily been on Walsh transforms [6] [10], though recently there has been renewed interest in using Reed-Muller coefficients [1] [2] [8] for this purpose.

The properties of RM coefficients are well known and have been studied extensively [3] [4] [7] [11].

Significant advantages can be obtained over dc measurements if the magnetic field and the current to the Hall sample are sinusoidal functions of different frequencies [1].
Their testing poses special problems however and a large number of techniques for designing testable PLAs have appeared in literature [1-7].

As is indicated, the reporting verbs of the subject oriented type of references are mostly in the passive form of the present perfect tense.

(iii) Weak Author Orientation

In the entire IEEE corpus, there are only 4 occurrences of references of the weak author orientation type all of which can be found in the PS introductions. The examples are listed as follows:

PS 8 In this case, the investment and operation problems can be solved together [Garver, 85; Junior, 89; Seifu, 89], or using decomposition principles [Beglari, 75; Perreira, 85; Levi, 91; Romero, 94].

PS 8 As the computational burden for obtaining the minimum cost plan is very high, recently, modern techniques have been proposed to decrease the CPU time, or even for searching sub-optimum solutions [Romero, 95; Gallego, 96].

PS 8 Moreover, the number of experts in the power system companies has decreased rapidly, which was observed in [Cigre, 95].
These are the main reasons why expert system has been applied to power system problems [Zhang, 89; Dillon, 90; Huneault, 94; Geront, 92; Balu, 92].

In the above instances of weak author orientation, the passive form of the tense which may be the past or present perfect tenses, or of a modal like 'can' is often used in the main or subordinate clauses. It is noted that this type of author orientation is only found in one introduction of the power system sub-discipline; this shows that this type of referencing is the exception rather than the rule in the submission of I.E.E.E. articles.
Below is a table summing up the 3 types of orientation used by the local authors in referencing:

**Table 4.10**
Three Orientation Types of Citation in Move 1 Step 2 (LA)

<table>
<thead>
<tr>
<th>TYPE OF ORIENTATION</th>
<th>STRUCTURE</th>
<th>FREQUENCY</th>
<th>EXAMPLE</th>
<th>PREFERRED TENSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Strong Author Orientation</td>
<td>S (R) - Vrese-that x</td>
<td>7</td>
<td>Widrow (1987) suggested that in order for the neural network to learn a function well, the number of training patterns has to be ten times the number of weights in the network. The method based on the conditional probability approach was first reported by Billinton and Bhavaraju.</td>
<td>Past</td>
</tr>
<tr>
<td>- 10 instances (27.8%)</td>
<td>X Vrep by R</td>
<td>3</td>
<td></td>
<td>Past/Passive</td>
</tr>
<tr>
<td>B) Weak Author Orientation</td>
<td>X Vrep (R)</td>
<td>2</td>
<td>There have also been attempts by researchers in selecting the correct number of training patterns for a particular neural network model (Baum and Haussier, 1989), Moody 1992, Schwartz et. al., 1990). There have been attempts to select or prune the number of hidden neurons automatically (Kung and Hwang, 1988, Hirose et. al., 1991, Murase et. al., 1991, Sletsma and Dow, 1991), however, these methods are not popular and have not been proven to be successful for a variety of applications.</td>
<td>Perfective</td>
</tr>
<tr>
<td>- 3 instances (8.3%)</td>
<td>(R) Vrep</td>
<td>1</td>
<td></td>
<td>Perfective</td>
</tr>
<tr>
<td>C) Subject Orientation</td>
<td>Reported</td>
<td>10</td>
<td>The properties of RM coefficients are well-known and have been studied extensively [3] [4] [7] [9] [11]. Composite system reliability evaluation entails the application of the frequency and duration technique like that in distribution system analysis but the mathematical basis is that of the conditional probability approach.</td>
<td>Perfective</td>
</tr>
<tr>
<td>- 23 instances (63.9%)</td>
<td>Unreported</td>
<td>13</td>
<td></td>
<td>Present</td>
</tr>
</tbody>
</table>

In Table 4.10, 'S' represents 'Subject', 'V' for 'Verb' and 'R' for 'Reference'. It shows that the past tense is only used in the strong author...
oriented type of references as opposed to the subject oriented type of references which are usually expressed in either the present perfect or the present tense. This behavioural pattern of the tenses reflects their inherent functions; the past tense accords a reporting act of previous action, the present tense, the applicability of the fact in the present while the present perfect, the recency of the action indicated.

In distinct contrast to prolific use of strong author orientation type by the local writers in referencing, the weak author orientation type of referencing is an exception. The 3 LA instances, all of which have been taken from a single introduction, are listed as following:

LA 13 *In recent years, a number of learning schemes and architectures for control purposes has been proposed.* (Werbos, 1991).

LA 13 *There have also been attempts by researchers in selecting the correct number of training patterns for a particular neural network model* (Baum and Haussler, 1989, Moody, 1992, Schwartz et. al., 1990).

LA 13 *There have been attempts to select or prune the number of hidden neurons automatically (Kung and Hwang, 1988, Hirose et. al., 1991, Murase et. al., 1991, Sietsma and Dow, 1991), however, these methods are not popular and have not been proven to be successful for a variety of applications.*
Despite the fewness in number as in the LA examples given, it can be deduced that the tense used in weak author orientation type of references is that of the present perfect in both the active and the passive forms.

4.2.4 Analysis of Selected Sample Introductions

Sample introductions are taken from the IEEE corpus as these are also representative of those found in the LA corpus in terms of adequacy in the characterization of essential features. The following 2 introductions, MTT6 and AP5, are compared in terms of the differences in tense implications between a subject orientation and an author orientation.

MTT 6 The effect of bi-iso/anisotropic media on the guided electro magnetic propagation and antenna has also aroused the interest of many researchers. Thus a great deal of work on the electromagnetic propagation in waveguides filled with birefringent/electromagnetic propagation in waveguides filled with birefringent/chiral materials has been reported in the literature (e.g. [3]-[8], just to mention a few). The use of chiral media in microstrip antennas has also been considered in [9]-[11]; specifically, the possibility of reducing the losses due to surface-waves radiation in a microstrip antenna using a chiral substrate have been proposed in [9], although this topic has been discussed in [10]. Propogation characteristic of bi-
iso/anisotropic transmission line has also given rise to some interesting works. The dispersion characteristics of the fundamental mode of a microstrip on a chiral substrate are obtained in [12] and [13] and on a layered gyromagnetic and chiral substrate in [14]. In [15] and [16], the authors develop a TEM analysis of an inhomogeneous bi-iso/anisotropic multiconductor transmission line, extending the well-known telegrapher’s equations to these media. More recently, transmission-line models are proposed for hybrid modes in bianisotropic structures in [17].

Similar to other types of planar lines, and provided that the substrates have the proper symmetry, the dispersion characteristics of general bianisotropic layered and multi-conductor transmission lines can be studied using techniques based on the well-known spectral-domain analysis (SDA). In this paper, the general procedure shown in [18] is now applied and adapted to study the dispersion characteristics of the fundamental modes of several planar lines with chiral substrates.

The CNR's of impenetrable cylinders have been examined by numerous authors. These poles are related to surface propagating waves (creeping waves) [13]. The same waves mechanisms are also called 'Franz waves' for acoustic scattering from a 'rigid sphere' in fluids [4], [15]. This type of wave propagates in the external medium and is mainly determined by the surface geometry instead of the interior material property. Ashkin [6] has shown experimentally
that these creeping waves are launched by grazing incident rays. Fahlen and Bryant [7] also provided an astonishing visualization of surface waves on water droplets. Once these creeping waves are launched, they propagate along the surface with attenuation due to the continuous radiation in the tangent direction. The diffraction coefficients of a smooth transparent object has been derived by Chen [8]. Franz and Beckmann [9] also studied the creeping waves for objects of finite conductivity. Chan et al [10] and Barber et al [11] used resonance signatures to characterize dielectric objects. An excellent discussion about the high-frequency scattering by a dielectric sphere is given by Nussenzveig [2], [12]. Although Conwell et al [13] also discussed the resonances of dielectric spheres, they did not separate the internal and external modes. They dealt with only a sphere with refractive index of 1.4. This paper investigates much more general situations...

In MTT6, the authors have reinforced the applicability of the investigative works in the past in the use of the active and passive form of both the present and the present perfect tenses. A Move 2 in which the modal 'can' in the passive form is used, is, first, to interject a sense of possibility of utilizing a particular technique, and, second, to signal the transition from the narration of previous efforts of various authors to the present research. The following Move 3 Step 1 confirms this diversion of attention from the past to the present moment.
In AP5, the authors have used 2 types of orientation in their referencing. For instance, Move 1 Step 2, found in sentence 2 to sentence 4, is subject orientated and are in the active or passive form of the present tense. However, Move 1 Step 3 in sentence 5, is strong author orientated where the quoted author is the subject of the verb. In contrast to this, Move 1 Step 3 in sentence 8, though of the strong author orientation type, carries the quoted author as the agent of the verb. Finally, Move 1 Step 3 in sentences 9, 10 and 12 is of strong author orientation type where the quoted authors are the subject of the verbs in the past tense. This use of the past tense implies discontinuance in referencing with the succession of Move 3 Step 1 as signalled by ‘this paper’.

4.3 Rationale of Move 1 Step 3 (Establishing a Gap)

This move-step expresses the author’s desire to ‘a claim in transformation from one situation to another’ (Duderstadt, 1982,p.66). A gap is effectuated when constraints in the existing investigation are identified and these constraints, in turn, represent absolute requirements on the solution. Thus, a gap affects the type of solution emphasized in the search for alternatives. The remainder of this section seeks to investigate the connective links of establishing a niche, for example, the use of connectors, which, as claimed by Swales, are extremely interesting but ‘have not received the attention they deserve either from a general or an applied perspective’. Further, in comparing the use of this move-step in a few examples, the
functions of Move 1 Step 3 are delineated and relevant lexical items identified. Although not specifically mentioned in the 'Guidelines to the Publications of the Institution of Engineers, Malaysia', the fact this move-step is mobilized implies the originality of the current contribution. Thus, it is felt that more space in the publication guides be devoted to illuminate the role of a gap in bridging previously published work to the present one.

4.3.1 Use of Connectors

In the IEEE introductions, there are 3 instances in which this move-step is established using an adversative connector 'however':

AP 6  *However, wide-band antennas for radar and telecommunication applications require the determination of the antenna performance in a wide frequency range.*

MTT 5  *However, little information has been reported to quantify the optical effects on real analog-control circuits having different functions and with different field-effect transistor (FET) based technologies operating in different modes.*

PS 4  *However, some of the remedial actions would affect only some load points and the indices calculated at bulk load points reflect these conditions.*
In the above IEEE examples, 'however', an adversative connector, is found in the initial position of the noun phrase that precedes the verb. This frontal positioning of the linking word indicates a more decisively marked departure from the previous proposition than if the same connector were used following the verb in the sentence. Interestingly, there is no instance where this connector is found after the verb in a statement.

Another way of signalling Move 1 Step 3 is through the use of a contrastive connector, 'although', as in the following IEEE examples:

BE 1 *Although* heart auscultation has been recognized for a long time as an important tool for the diagnosis of heart disease, its accuracy is questionable due to the limitations of auditory perception of the sounds which are closely spaced in time or have low frequency components.

MTT 2 *Although* the propagation properties of leak modes on printed-circuit lines have been studied quite thoroughly in recent years, much less attention has been devoted to the interesting and practical issue of excitation of these modes by a practical source of finite size, such as a delta-gap feed on the conducting strip or a probe feed.

NS 4 *Although* the OHS with HCB collimators can be used with short focal distances and therefore potentially has the highest sensitivity
and resolution in emission images, it cannot be used for simultaneous ECT-TCT imaging.

As can be seen from the above, ‘although’, a contrastive connector, is placed in the initial position of a subordinate clause that uses the passive form of a tense like the present perfect, or a modal, like ‘can’. In such statements characteristic of a Move 1 Step 3, lexemes indicative of the gap like ‘questionable’, ‘less’ and ‘cannot’ can be found in the main clause of the sentence.

There appears to be a more extensive use of the adversative connector ‘however’, than any other connectors in the work of the local authors. A total of 8 LA instances in which connectors are used are as follows:

LA 4 To build a similar ADC using off-the-shelf components, however, would be wasteful on comparators.

LA 4 Feeding back the signals, however, incurs an added complexity in the control of the signals.

LA 8 However, this type of empirical approaches has proved to be costly, time-consuming and inefficient.

LA 10 There is, however, a limit to the diameter of the cable from the economical and mechanical point of view.
LA 13 However, the neural network learning of the plant's inverse model is not really straightforward.

LA 13 However, in the case of neuro-control the neural network is trained to learn the relationship of the patterns, therefore, using a large number of training patterns may cause overfitting of the function to be learned.

LA 14 However, the design process of a switched mode converter is far more complex compared to linear converters, with a higher number of parts and technologies used.

LA 20 However, the position of the sonic line is rarely known in advance and the numerical arrangement for dealing with the transaction from one method to the other is complex.

As can be seen in the examples quoted, the use of the connector 'however', is customarily followed by the use of lexical items that carry negative connotations as in nouns like 'complexity', 'limit' and 'overfitting'; adjectives like 'wasteful', 'costly', 'time-consuming', 'inefficient' and 'complex'; adverbs like 'not' and 'rarely'. This is to doubly reinforce the negation of the preceding statement.

In the case of the use of other connectors, there are 2 LA instances of the use of 'although' and a single instance of the use of 'but' as in the following:
LA 2 Although the technique is very important and has been widely used in many developed nations, the technique however, has not received much attention in developing countries of the world including that of Malaysia.

LA 11 Although system identification techniques for linear systems are now well established and have been widely applied, the identification of non-linear system has not received such an exposure.

LA 17 Symbolic artificial intelligence is able to capture some features of higher cognitive function for instance logic, inference, deductions but is still unable to explain consciousness.

In the LA examples quoted, it is noted that the connector 'although' is often used in connection with the negative adverb 'not' while in the case of the connector 'but', it is usually succeeded by words with negative connotations such as the use of a negative prefix like 'un'.

4.3.2 Use of Negative Elements

There are several interesting ways in which the IEEE authors express the negative in the third move. It is found that a negative determiner like 'no' and an indefinite determiner like 'little' are usually attached to the noun
phrase, while the adverb 'not', is placed after the verb. Lexical items of which verbs like 'suffer' and 'fail', and nouns like 'failure', 'deterioration' and 'lack' apparently carry negative connotations. Thus, a rather comprehensive range of linguistic items that can be categorized into 3 groups as determiners (negative and indefinite), adverbs and other lexical items have been used to typify this move-step. This is illustrated in Figure 4.1.

### Figure 4.1
**Use of Negative Lexical Elements in Move 1 Step 3 (I.E.E.E.)**
In the local article introductions, Move 1 Step 3 is signalled in a similar way by the use of the negative which may be grouped under the negative determiners, adverbs and other lexical items as shown in the diagram below:

**Figure 4.2**  
Use of Negative Elements in Move 1 Step 3 (LA)
Referring to Figure 4.2 as shown, the negative determiner 'no' is often found preceding the noun in the nominal part of the sentence whereas the negative adverb 'not' is used before a past participle or in 1 instance, after the verb 'is', and when 'not' is attached to the modal 'can', it is followed by a verb. The lexical items connoting the negative, comprises adjectives and nouns, and apparently this is the most common of the 3 ways in establishing a gap among the local authors.

4.3.3 Analysis of Selected Sample Introductions

We will consider 3 I.E.E.E. examples, PS8 and PS9 followed by AP1, to examine the functioning of the gap as established by Move 1 Step 3.

(a) PS 8

M1-S3. The difficulty of this implementation is related to the difficulty of representing the heuristic knowledge involved in this area into code in a procedural program. Besides, it is not possible to emulate the planner reasoning in a conventional computational language.

M3-S1. Thus, an expert system, which allows not only the emulation of the planner intelligent behaviour, but can represent all knowledge associated with this problem in an appropriate way was developed.
M1-S3. *In these works, a binary codification was used, but this codification makes it difficult to include some relevant design aspects in the mathematical models.*

M3-S1. *However, the integer codification introduced in this paper surpasses these limitations.*

In the examples shown, Move 1 Step 3 is immediately succeeded by Move 3 Step 1; this means the gap that is opened by one move-step is subsequently closed by another. For example, in PS8, the negative implications of the noun ‘difficulty’ and the adverb ‘not’ in Move 1 Step 3 are counterbalanced by the positive implications of the expression ‘not only...but can...’ in the following Move 3 Step 1. Similarly, in PS9, the gap opened by the connector ‘but’ and the adjective ‘difficult’ in Move 3 Step 1 are closed by those of ‘however’ and ‘surpasses’ in Move 3 Step 1. Thus the function of the gap here is to signal to the reader that the validity of the previously reported information has reached an end in order to set in motion the third move.

(c) AP 1

M2-S1 *Different schemes have been proposed to increase the number of users in a fixed spectrum slot. Frequency division multiple access*
(FDMA) assigns each user to transmit on a separate frequency band in the same time slot. Time division multiple access (TDMA) assigns each user to transmit during a different time slot while sharing the same frequency band. Code division multiple access (CDMA) assigns a unique code to each user to encode the transmitted signal and allows multiple users to share the same frequency band and the same time slot.

M1-S3. Although these approaches do significantly increase the channel capacity, each scheme basically is attempting in its own way, a more efficient use of the same resource. Since radio-frequency (RF) bandwidth is a limited resource, these techniques have approached their fundamental limitations.

M2-S1 Other proposals such as micro-cells have also been suggested.

M3-S1 Though the channel capacity can be increased to some extent by subdivision, it is very costly, involves more cell sites, and too frequent handoffs.

M2-S1 Since different mobile users transmit from and receives at different spatial locations, besides frequency, time, and code diversities, there is very rich spatial diversity that can be exploited to significantly increase the system capacity as well as improve the system performance.
M1-S3 However, this spatial diversity is *not* exhibited a traditional single-antenna system, but rather requires the use of spatially separated multiple antennas or an antenna array.

M1-S2 Therefore, any SDMA system must have an antenna array at a base station to exploit the spatial diversity among different users.

M1-S3 Many existing and new array-signal processing techniques are being proposed for the SDMA scheme, but most of the performance evaluation to date relies on computer simulations or theoretical analyses based on ideal assumptions. No spatial signature variations due to the channel propagation effect have yet been taken into account, although the channel propagation effect is critically important to the design engineer of an SDMA system.

M1-S2 For example, the variation of the spatial signature due to motion may help him determine the appropriate update rate of the spatial signature.

M3-S1 The purpose of this paper is to describe various propagation experiments carried out in typical scenarios, to derive the spatial signature and direction of arrival (DOA) variations and to demonstrate the rich diversity and potential benefits of using an antenna array for wireless communications.
The function of the gap in AP 1 is to show up the inadequacies of the previous research in the light of the present investigation; and when this is accomplished through the use of a series of gaps, it can be taken that the authors are attempting to narrow down the problem to the point where the third move naturally takes over in the reporting of the research. In the example extracted from AP1, the pattern of alternating the Move 1 Step 3’s with Move 2 Step 1’s clearly illustrates this intention of the author. Thus the broad issue of the limitations of approaches is fine-tuned to the specific issue of the lack of spatial signature variations through the use of a total of 6 gaps. The lexical items employed for this purpose may comprise various parts of speech, a noun as in ‘limitations’, adjectives as in ‘costly’ and ‘limited’, adverbs as in ‘too’ and ‘not’, and a negative determiner, ‘no’.

To understand the function of Move 1 Step 1 in greater depth, 2 local introductions, LA 19 and LA 2 are examined:

(a) LA 9

M1-S2 The last two decades have seen some significant improvements in the design of rotating machinery. Manufacturers had attempted to improve the process performance of modern machinery by
incorporating flexible, relatively unsupported shafts, and high mass inertia with higher operating speeds.

M1-S3  Whilst efforts in research and development were concentrated on improving the performance of machinery, the rotor dynamics aspects of the machinery was not given adequate consideration. As a consequence, potential vibration problems resulted leading to expensive machinery incapable of operating at its rated speed and load.

M2-S1  Rotor dynamics analysis is an analytical method of studying the dynamic behaviour of rotating machinery.

M1-S1  Important applications of rotor dynamics analysis are in machinery design and design audit.

M3-S1  This analysis had also been utilized to optimize the placement of sensors for machinery monitoring purposes, and for trouble-shooting machinery vibration problems.

M1-S1  Current research work undertaken in research institution overseas integrating rotor dynamics analysis with condition monitoring programmes are proving useful. The possibility of rotor dynamics as an integrated part of a diagnostic system will become a reality in the near future.
This paper is intended to create an awareness in the industry on the importance and manner rotor dynamics analysis can help improve the reliability of machinery.

The authors of LA 19, after having provided some background information that efforts were concentrated on the upgrading of machine performance (Move 1 Step 2), go on to establish the gap that this is done at the expense of neglecting the rotor dynamics aspects of the machinery (Move 1 Step 3). To help the reader realize the extent of the need to rectify this situation, the authors side-step the issue of the gap by explaining the importance of rotor dynamics analysis (Move 2 Step 2 and Move 1 Step 1) before resuming the discussion with the assertion of how the current article may provide the solution, thereby closing the gap.

(b) LA 2

The planning and operation of modern electrical power systems requires an assessment of the quality of the system\textsuperscript{1,2}. In this respect reliability engineering has become an important and indispensable tool\textsuperscript{3,4} for power system designers and planners and has enabled them to predict the future performance of their system using past records. Considerable work\textsuperscript{5,6} has been done in improving the available techniques in reliability evaluation, especially on the
generation side, so that almost accurate prediction of the performance of a real system is now possible.

M1-S3 Although the technique is very important and has been widely used in many developed nations, the technique however has not received much attention in developing countries of the world including that of Malaysia. This may be due to the lack of appreciation of the underlying principles and its practical implications.

M3-S1 Thus this paper will serve to introduce the basic ideas and show their practical application to the local power distribution system.

In contrast to LA 19, the author of LA 2 adopts a more straightforward approach in that having cited the relevant literature in 3 sentences to constitute his Move 1 Step 2, he immediately establishes the gap as signalled by the negative adverb 'not' and the noun 'lack' in Move 1 Step 3, after which he shows how his contribution can help to close the gap by stating the purpose of his investigation.

4.4 Move 2 Solution Assumption

In proposing a solution, the second move plays a functional role of bridging Move 1, which introduces the problem, and Move 3, which presents the experiment that has been carried out. This second move is initiated to
consider an approach, technique or model first on a descriptive basis in order to provide a clear understanding and an intuitive feeling for its behaviour. It is generally found that such a qualitative insight into the operation of the method is first established before mathematics is used to express quantitative relationships. This move serves to refresh the specialist reader's memory as well as to expedite the non-specialist reader's understanding of the general nature of the solution proposed. In this way, Move 2 paves the way for the present investigation in Move 3.

The length of this move varies with the level or type of readership the author is seeking to attract and its main purpose is that of elucidation of theories, models or techniques that are found to be suitable in problem-solving. It is found that the quantifiable grammatical item is that of the use of the compound nouns; on the other hand, it is impossible to quantify the entire range of the adjectives used since they are mostly single-instance items.

4.4.1 Rationale of Move 2 Step 1 (Defining Scope of Topic or Explaining Method of Investigation)

In this second move, the author, in making an assumption on the solution of the problem, is most likely to devote, at times, a great deal of space to defining the scope of the topic, or alternatively, by explaining the method of investigation as in Move 2 Step 1. Since the content of scientific writing is basically expository, there is a predominating tendency in the generalizing or universalizing of factual statements. However, the extent to which the author defines his subject is strictly in accordance with his realization of meeting the
needs of different levels of readership. For instance, if the audience comprises mainly specialist readers, there is a lesser need for the author to go to great lengths to explain the concepts and terms used than if he were to be writing for a mixed audience of specialist and non-specialist readers. To arrive at some concrete understanding of what really constitutes the linguistic exponents as well as stylistic elements pertaining to the 2 move-steps, it is expedient to select several examples for a closer examination.

In the case of the local introductions, an expert handling of this move-step is particularly exhorted by the publication guide as in: 'The writer should bear in mind that his object is to communicate information efficiently and effectively to the reader. Even workers in the same field appreciate clear indications of the line of thought being followed, and frequent guideposts are essential for non-specialists who want to understand the general nature and significance of the work' (Guidelines to the Publications of I.E.M., 1990, p. 14). Thus the function of this move is to fulfil its primarily illuminating function through efficient and effective communication, as well as clarity in execution in catering to both specialist and non-specialist readers.

4.4.2 Use of Compound Nouns

A distinctly quantifiable grammatical item found in expository writing is the use of compound nouns composed of two or more nouns. This built-up or accumulation effect of a combination of two to four nouns forming a
compound constitutes to overall conciseness and briskness in scientific writing and thus can be considered as a kind of short-circuit device by which a succession of ideas can be packed within a relatively short space. The frequency distribution of the compound nouns in the IEEE article introductions has been tabulated in Table 4.11:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 nouns</td>
<td>50</td>
<td>86</td>
<td>40</td>
<td>43</td>
<td>50</td>
<td>488 (88.1%)</td>
</tr>
<tr>
<td>3 nouns</td>
<td>10</td>
<td>11</td>
<td>4</td>
<td>19</td>
<td>14</td>
<td>58 (10.5%)</td>
</tr>
<tr>
<td>4 nouns</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6 (1.1%)</td>
</tr>
<tr>
<td>5 nouns</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>--</td>
<td>1</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>6 nouns</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Tot. No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>554</td>
</tr>
</tbody>
</table>

From Table 4.11 is noted that the majority of the compound nouns comprises 2 nouns while those composed of 3 nouns are a fraction of this; compound nouns bearing 4 to 6 nouns are rarities.
Some of the two-word compound nouns found are:

AP 3  Ideally a truncation technique should not create any reflections, at the boundaries where boundary conditions are enforced, to disturb the fields in the domain of the subject.

BE 3  The force produced by an electrically stimulated muscle depends on the stimulus intensity and the stimulus frequency.

NS 4  Possible uses of transmission images include non-uniform attenuation and scatter correction, multi-modality visualization and image registration.

NS 4  Fast transmission acquisition is possible due to the high sensitivity of CB systems for transmission photons.

Examples of the three-word compound nouns are as follows:

AP 6  Furthermore, the near-field truncation error can be rigorously zero in the time-domain analysis, provided that the observation time is not too large.
Many semi-conductor based devices using Si (Li) and CdTe do have very nearly 100% detection efficiency for medium energy beta particles (energies less than ~ 900 ke V).

Another class of semiconductor detectors, surface barrier detectors, possesses very nearly ideal characteristic.

In fact the transmission expansion planning is a dynamic problem because the planner has to plan the system expansion for the horizon year and analyze the system behavior for each planning stage as well.

Examples of the four-word compound nouns are as follows:

The time-domain diakoptics method has been developed accordingly in the transmission-line matrix (TLM).

The problem of decreased resolution can be avoided by using quarter cone beam collimators.

The system also reduces crosstalk between emission and transmission data energy windows.

Existing composite system reliability evaluation models typically include emergency and load curtailment (controlled and
uncontrolled or in order words emergency and extreme emergency) states.

In the case of the local introductions, it is noted that Move 2 features the use of compound nouns comprising two or more nouns that build on one another resulting in a cumulative effect that is. As an illustration of this, the following LA examples of the use of compound nouns may be considered:

LA 3 **Reliability evaluation of a composite generation and transmission system** are concerned with the problem of determining the adequacy of the combined generation and transmission system with regard to providing a dependable and suitable supply at the bulk load points. Thus a complete investigation involves the examination of every possible outage conditions in the system and a loadflow technique is used in this respect.

LA 5 For example, reducing the number of components in a system increases system reliability while decreasing system size, cost and power consumption.

LA 5 Other important performance parameters are power dissipation, open-loop voltage gain, output voltage swing, equivalent input flicker and thermal noise, power supply rejection ratio (PSRR) common mode rejection ratio (CMRR), supply capacitance and die area.
Process simulation can also provide an insight into the physics of the diffusion mechanism and hence to use this understanding to achieve superior device performance.

The manufacture of a VLSI chip involves a wide range of silicon fabrication techniques including layer deposition, etching, photolithography, dopant introduction and layer growth.

In contrast, a number of process models have been developed which can simulate the important physical steps within silicon fabrication.

The phase-plane method is basically a graphical procedure for determining the transient response of first and second order nonlinear system i.e. in general provides a useful way of representing the dynamics motion and the stability of the nonlinear system.

The system identification problem can be defined as the complete determination of the characteristics of the system from measured input and output data. The identification procedure is generally based on structure detention test, parameter estimation techniques and model validity tests.

As is evidenced from the examples quoted, most of the compound nouns that are used by the local authors are of two or three nouns and occasionally, four; with the nouns preceding the final one performing an adjectival function.
With this manner of labelling the nouns, a compression of several concepts or ideas is made possible, giving a sense of density to reflect the compactness of the subject.

4.4.3 Use of Modifiers

Despite the fact that there appears to be a wide range of modifiers used, most of which are specifically connected to a particular specialty in the field. However, an attempt to categorize modifiers that are found to have occurred more than once has been made in the following section. For a start, it is noted that the descriptive aspect of statements is reinforced by using modifiers as qualifiers in the nominative form of adjectives and then in the comparative forms of an adverb. Additionally, modifiers are also used as quantifiers in the form of indefinite determiners.

(a) Modifiers as Qualifiers in Nominative and Comparative forms

In the case of the modifier as qualifiers in the nominative form of adjectives, there are a total of 5 instances of the use of ‘basic’, 4 instances of ‘new’ and 3, of ‘useful’. 
Examples with the adjective 'basic' are:

AP 2  This is the basic idea behind space-time adaptive processing (STAP) which was first proposed in [1] in 1973.

BE 2  The basic idea of time-scaling of the PCG is to expand the signal in time while keeping the same spectral properties.

PS 4  The basic techniques for reliability assessment can be subdivided in terms of their application to segments of a complete power system.

PS 4  The three basic functional zones for the purpose of planning, organization and/or analysis are: Generation, Transmission and Distribution.

PS 9  The basic problem has been usually considered as the minimization of an objective function representing the global power system expansion costs in order to solve the optimal sizing and/or locating problems for the feeder and/or substations of the distribution system.

Examples bearing the adjective 'new' are:

BE 5  This new technology eliminates many of the problems encountered with surface stimulation.
Recently, a new class of artificial chiral materials suitable for microwave waveguides in planar technology was proposed in [2]. These new media are based on the inclusion of small magnetostatic-wave resonators with a surface metallization in a host medium and are expected to make chiral planar microwave waveguides and transmission lines real technological devices in the very near future.

In order to determine the effectiveness of the new devices on a network-wide basis, it will become necessary to upgrade most of the analysis tools on which power engineers rely to plan and operate their systems.

Examples that use the adjective 'useful' are:

Bisotropic media are also potentially useful in a broad field of applications.

It is also useful to assess the effects of the forest on the digital-spectrum of radio communication systems.

Bisotropic media are also potentially useful in a broad field of applications.
2 instances of the adjective ‘better’ are:

NS 2  The assumption is that this detection module would allow the construction of a combined SPECT/PET imaging system with better count rate performance in the coincidence mode compared to current dual headed scintillation cameras.

AP 2  Much better clutter suppression performance can be obtained by fully exploiting the distribution characteristics of the airborne clutter spectrum in the spatial-Doppler (or spatial-temporal) domain and adaptively forming two-dimensional nulls matched to the clutter spectrum distribution.

In addition, 2 instances of the modifier as a qualifier in the comparative form of an adverb:

BE 1  This could help the physicians to better detect the different sound components which are difficult to distinguish on the original PCG sequence, especially when the heart rate is increased. Also, it may help medical students to better understand the PCG structure and learn faster the art of auscultation.

BE 1  Frequency expansion could be helpful to better distinguish the heart sounds with multiple low-frequency components.
Modifiers as Quantifiers in the Form of Indefinite Determiners

There are 5 instances in which modifiers take the form of indefinite determiners indicating quantity are found and they are as follows:

PS 5 There are many aspects of the topic that require research attention. Many kinds of power electronics-based plant components have already been built.

PS 6 Many operating decisions are based on such forecasts, including real time generation control, security analysis, spinning reserves allocation and energy transaction planning.

MTT 4 Large microwave active circuits are built from many microwave components and lumped elements.

NS 10 Many semiconductor-based devices using Si (Li) and CdTe do have very nearly 100% detection efficiency for medium energy beta particles (energies less than ~ 900 keV).

It is evident from the above IEEE examples, that the present tense has been the most consistently used tense throughout the entire text, though there are 2 instances of the present perfect tense, 3 instances of the past tense and 1 instance of the future tense. Modals like ‘can’, ‘could’ and ‘would’ are used
but rather restrictively since expository writing is mostly founded on fact. The complexity of the Move 2 statements is due to, first, the use of complex sentences that require the attachment of one or more prepositional or participial phrases to the main clause; and second, the use of subordinate clauses that use 'which' or 'that'. Thus, the type of sentences that are commonly used reflect the complex nature of the field of electrical and electronic engineering. Indeed in stark contrast to this, there is a marked absence of simple sentences since this type of sentence does not quite support the compact style that is characteristic of scientific expression.

In the case of the local introductions, to a certain extent, modifiers are mostly used as qualifiers in the nominative form of adjectives, like 'useful', 'complete' and 'main', when ascribing to character of research.

There are 3 LA instances in which the adjective 'useful' is used and they are as follows:

**LA 8** *Simulation is also useful for evaluating the feasibility of new structures or to make improvements on existing ones.*

**LA 9** *The phase-plane method is basically a graphical procedure for determining the transient response of first and second order nonlinear system i.e. in general provides a useful way of representing the dynamic motion and the stability of the nonlinear system.*
Current research work undertaken in research institution overseas integrating rotor dynamics analysis with condition monitoring programmes are proving useful.

There are 2 distinct instances where the adjective 'complete' is used as in the following:

**LA 3** Thus a complete investigation involves the examination of every possible outage condition in the system and a loadflow technique is used in this respect.

**LA 11** The system identification system problem can be defined as the complete determination of the characteristics of the system from measured input and output data.

There are 2 instances which carry the adjective 'main' or 'major' as in the following:

**LA 3** The supply of electrical energy is the main function of an electric power utility.

**LA 8** This is due to two major reasons: computer simulations are less expensive and much faster than experimental approaches.
4.4.4 Analysis of Selected Sample Introductions

Four IEEE examples are taken from MTT7, PS8, BE9 and AP5. In the discussion that follows, MTT7 will be compared with PS8, and BE9, with AP5.

(a) Comparison of MTT7 and PS8

MTT7 The multilayer PCB usually consists of four metalized layers, equally spaced, with dielectric materials as shown in Fig. 2. Circuit elements are mounted on the top metallization layer, while the second and fourth metallization layers serve as the grounds. Elements, such as the resonator and transmission lines TL1 and TL2...are usually located in the third metallization layer using stripline technology. Very often, VCO size can be reduced further by use of smaller chip resistors and capacitors, such as the 1005 style (the width and length are 0.5 and 1.0 mm., respectively).

One of the key features of the circuit in Fig. 3 is in reduction of the dc current by having 2 transistors share the same emitter current. In this configuration, the output power may be reduced because it limits the output voltage swing. However, the required power is usually small, typically about 0 dB m. Thus reduction in the dc current may become a key requirement of the VCO's for mobile
communication handsets. The circuit in Fig. 3 achieves low dc-
current consumption and meets all the other VCO requirements.
Thus, it is highly probable that the VCO circuit in Fig. 3 will be
used in next generation, high-frequency mobile-communication
systems.

PS 8

Firstly, the long term expansion planning is executed (20 years
ahead), where the electrical model of the system may be simplified.
Secondly, the medium term planning (10 years ahead) is
performed. In this case, all expansion alternatives obtained
previously in the long term planning, are analyzed and the planner
represents the electrical network in more detail. Short-circuit,
transitory stability, reliability as well as economic studies are
performed. Finally, the short term planning, involving studies 5
years ahead, is executed.

In MTT7, the word ‘multilayer’ and ‘4 metalized layers’ are
synonymous while the use of ordinal numbers such as ‘second’, ‘third’ and
‘fourth’ is to order the facts of the 4 metallization layers of the printed circuit
board (PCB) in a sequence. Alternatively, in PS8, the adverbs ‘firstly’ and
‘secondly’ are placed at the beginning of the sentence to achieve the same
effect as in the following:
Firstly (adverb-sequential link)/the long term expansion planning (subject)/is executed (verb)/(20 years ahead) (complement) – (S-V-Ph. Pattern).

Secondly (adverb-sequential link)/the medium term planning (subject)/(10 years ahead) (phrase)/is performed (verb) – (S-Ph.-V Pattern).

Finally (adverb-sequential link)/the short term planning (Subject)/involving studies (5 years ahead) (Phrase)/is executed (S-Ph.-V Pattern).

Despite the slight differences between MTT7 and PS8, the similar structuring in both introductions functions like a mnemonic device in helping the reader to understand the text. It must be pointed out that the specification in description of MTT7 as compared to the generalization of PS8 suggests that a more specialist audience is being addressed.

(i) Tense Considerations

In PS8 the present tense predominates with 5 instances in the passive form and 1 instance in the active form. A modal ‘may’ is used in the passive form to alleviate the repetitive, monopolistic use of the present tense in the structuring of the sentences. This tense behaviour is reflected in MTT7 where there are 4 instances of the present tense (2 in the active form) and 2 in the passive form, and ‘can’ is used once in the active and another time in the passive form. Thus, it is clear that
while the present tense predominates in defining, a modal is also used to introduce some variation in the construction of sentences.

(b) Comparison of AP 5 and BE 9

AP 5  Both the sphere and its ambient medium are assumed to be homogeneous, isotropic, and lossless. The CNR's are related to the singularities of expansion coefficients. These CNR's used as a signature are far less damped when the dielectric constant of the sphere exceeds that of the ambient medium. This case will be referred to as a dielectric sphere whereas the reverse case is designated as a dielectric bubble. The resonances associated with either a dielectric sphere or bubble can be separated into internal and external modes. The internal resonances are caused by the internal waves that experience multiple internal reflections, whereas the internal modes are caused by the surface creeping waves. The physical mechanisms associated with the internal and external resonances are explored by examining the resonances of impenetrable spheres and bubbles such as perfect electrical conducting (PEC) and perfect magnetic conducting (PMC) spheres and spherical cavities. The resonance mechanism of general dielectric spheres or bubbles are highly related to those of impenetrable spheres and bubbles.
The TEM (transverse electromagnetic) cell is simply described as a section of rigid, air-insulated coaxial line wherein the inner conductor (the septum) is a long, flat plate and the outer conductor is a rectangular tube. RF energy flows longitudinally along the line. If the frequency of the RF source is bounded to cut off non-TEM waveguide modes, the TEM cell generates reasonably uniform electric (E) and magnetic (H) fields in any transverse cross section of the cell, at points away from the edges of the septum. Flared transition sections from the relatively large rectangular cross section of the TEM cell to the adjoining narrow diameter, circular cross sections of flexible coaxial cable are provided to smooth the flow of energy from the RF source into the cell and to the matched load. Biological tissue cultures are placed within the TEM cell and exposed to the propagating fields. The culture dishes can either rest upon the septum if the TEM cell is positioned horizontally, or can be oriented perpendicular to the septum if the TEM cell is positioned vertically.

(i) Stylistic Considerations

The stylistic elements of AP5 have been encapsulated in the figure tree 4.2.
## Stylistic Elements of Move 2 of AP 5

### Acronyms/Abbreviations

<table>
<thead>
<tr>
<th>i) CNR for complex natural resonance</th>
<th>ii) PEC for perfect electric conducting</th>
<th>iii) PMC for perfect magnetic conducting</th>
</tr>
</thead>
</table>

### Repetition

| i. -dielectric sphere -dielectric bubble -dielectric sphere of bubble | ii. resonances of impenetrable spheres and bubbles - resonance mechanisms of general spheres or bundles - those of impenetrable spheres and bubbles | - |

### Parallelism

| i. internal resonances are caused by internal waves. & external modes are caused by surface creeping waves |

---

### Figure 4.3

**Examples of Stylistic Elements in Move 2 of AP 5**

In the above figure, the frequent use of abbreviated forms (4 instances), repetition (3 instances) and parallel structures (1 instance) helps to reinforce a better understanding of the specialist subject of electromagnetic resonances of immersed dielectric spheres. Such characteristics are similarly found in BE9 (Figure 4.3). Here again, abbreviated forms like TEM cell and RF energy/source are used and repeated 6 and 3 times consecutively. The 3 instances of repetition are expressed in parallel form. Thus, these 2 examples
establish the basic features of Move 2, the features that distinguish this move from the other two moves as well as to constitute a greater clarity of text.

Stylistic Features of Move 2 in BE 9

Abbreviations Repetition Contrast

TEM for transverse electromagnetic wave TEM cell (6 instances) The internal conductor ... is along flat plate
RF for radio frequency RF energy/source (3 instances) with ... the outer conductor is a rectangular tube.

Figure 4.4
Examples of Stylistic Elements in Move 2 of BE 9

(ii) Tense Considerations

There is tense consistency in BE9; it is written in the present tense of which 8 instances are in the passive form and 4 instances in the active form. To break the continuous use of a single tense, the modal ‘can’ is used; once in the passive form and once in the active form. This pattern is repeated in AP5 where the present tense is predominantly used with 8 instances in the passive form and 2 instances in the active form. The switch to the future tense in the passive form, ‘will be referred’, occurs once and there is an instance of the use of the modal ‘can’ in the passive, ‘can be separated’. Thus,
the use of the modal 'can' in the passive, 'can be separated'. Thus, these 2 IEEE introductions illustrate the predominant use of the present tense interposed by the use of a modal or the future tense in Move 2.

An analysis of the texts extracted from LA 15, LA 8 and LA 5 will help to delineate the grammatical characteristics of this move-step as the following:

LA 15 Any switching function of n variables can be represented in an RM canonic expansion.

\[ f(x_{n-1}, x_{n-2}, \ldots, x_0) = a_0 \oplus a_1x_0 \oplus a_2x_1 \oplus a_3x_1x_0 \ldots \oplus a_{N-1}x_{n-2}x_{n-3} \ldots x_0 \]  

where \( \oplus \) is the EXOR (module 2 sum) operation, \( N = 2^n \), \( a_i \in \{0,1\} \) and \( x_i \) may be \( x_i \) or \( x_i' \), but not both.

Because of the last property, the RM expansions are termed fixed polarity and there are \( N \) different expansions.

The polarity is identified by the binary number \( x_{n-1} x_{n-2} \ldots x_0 \) or its decimal equivalent with \( x_i \). 0 if \( x_i \) or positive and 1 if \( x_i' \) or negative.

In the studies on the use of RM coefficients for testing, the attention has been exclusively on those of zero polarity.

LA 8 Using available software and medium-size computer (e.g. VAX 11/780), one can simulate all critical process steps in a matter of minutes or hours. A real experiment, on the other hand, usually takes
from several days to a few weeks. Simulation is also useful for evaluating the feasibility of new structures or to make improvements on existing ones. In short, simulation programs can be applied to any application where it is helpful to see the effect of process changes on device performance without actually fabricating the device. Process simulation can also provide an insight into the physics of the diffusion mechanism and hence to use this understanding to achieve superior device performance. In fact, simulation of two dimensional (2D) profiles is becoming necessary because at present there is no reliable 2D profiling technique.

LA 5 The performance objectives for opamps to be used within a monolithic analog subsystem are often quite different from those of traditional stand-alone bipolar amplifiers. The most important difference is in the fact that for many of the amplifiers in the system, the load which the output of the amplifier has to drive is well defined, and is often purely capacitive with values of a few picofarads. In contrast stand-alone general purpose amplifiers usually must be designed to achieve a certain level of performance independent of loading over capacitive loads up to several hundred picofarads and resistive loads down to 2 kohms or less. Other important performance parameters are power dissipation, open-loop voltage gain, output voltage swing, equivalent input flicker and thermal noise, power supply rejection ratio (PSRR), common mode rejection ratio (CMRR), supply capacitance and die area.
From the preceding LA introductions, it is clear that in explaining the use of RM coefficients for testing in LA 15, the present tense in both the active, 'is', 'are' and passive forms, 'are termed', 'is identified', are mainly used, in contrast to single instances in the passive use of the present perfect tense, 'has been', and the modal, 'can be represented'. On the other hand, LA 8, which deals with the uses of simulation, is preponderate in both the active and passive use of the modal 'can simulate', 'can provide', and 'can be applied' though the active form of the present tense, 'is', is also used and an instance of the present continuous, 'is becoming', is noted. Yet another example, LA 5, which describes different types of amplifiers, is found to be mostly written in both the active and passive forms of the present tense with a single use of the modal 'must'. Thus, it is safe to surmise that Move 2 Step 1 is predominantly written in the active and passive forms of the present tense together with the use of modal like 'can' and an occasional use of tenses like the present perfect or present continuous tenses.

As regarding the stylistic elements of Move 2 in the local introductions, there is a common use of acronyms or abbreviations as shown in LA 5, PSRR for 'power supply rejection ratio' and CMRR for 'common mode rejection ratio'. However, it has to be pointed out that no substantial examples from the local introduction corpus can be reproduced here to illustrate the use of repetition or parallelism. This may be explained in that local authors do not seem to give as elaborate a description as their foreign counterparts.
4.5 Move 3 – Solution Presentation

The third move is wholly devoted to the presentation of the investigation which is based on the solution proposed in Move 2 in answer to the problem raised by the gap in Move 1. Although it is the procedural practice for authors to ‘respond to the functional type and prepositional content’ (Swales, 1981, p.64) of the final move only after having written either or both Move 1 and Move 2, we do find that the authors of newer sub-disciplines bypassing the other 2 moves to embark on Move 3 right from the start. This may prove to be a viable alternative in face of drawing a blank in literature pertaining to a relatively new area of investigation. Besides, of the three moves, Move 3 is essentially an integral part of the article introduction.

The third move features in the introduction as it contributes substantially to the discussion in activating 4 steps: Step 1 or Purpose, Step 2 or Sequence of Events/Present Research, Step 3 or Statement of Results and Step 4 or Organizational Structure. In contrast to the other moves, this particular move is relatively self-sufficient in that it resembles a routine laboratory report.
4.5.1 Rationale of Move 3 Step 1 (Stating the Purpose)

The purpose is stated to focus attention on the problem. It paves the way for the presentation of the solution to demonstrate its correspondence to known facts. It is a great convenience to have this move-step as a starting point in presenting the solution for most IEEE authors. It is noted that it is clearly stipulated in the LA guidelines that the purpose and significance of the paper be stated on having oriented the reader with the nature of the problem, which refers to the gap, and the background or previous work. Therefore the local authors' compliance with this subsequently results in the fact that very rarely do we find a local Journal introduction that opens with a Move 3 Step 1. Moreover, there are very few local investigations that are of the cutting edge category that really calls for a new approach in introduction writing such as its opening with a Move 3 Step 1. Generally, in stating the purpose, the authors explicitly direct the readers' attention to their contributions which usually embody the significant features.

4.5.2 Two Types of Purpose Statements – Purposive and Descriptive

In general, Move 3 Step 1, according to Swales, can be divided into two main groups: the purposive/teleological group, in which the aim or purpose is explicitly mentioned; and the descriptive/ontological group, in which the purpose or aim is implicitly mentioned.
Purposive Type

In the case of the IEEE introductions, 8 of the 10 teleological third moves are nominal and 2, verbal. The examples of the nominals are listed as follows:

AP 1  The purpose of this paper is to describe various propagation experiments carried out in typical scenarios, to derive the spatial signature and direction of arrival (DOA) variations and to demonstrate the rich spatial diversity and potential benefits of using an antenna array for wireless communications.

AP 6  Aim of this paper is to apply these optimal interpolations of the near field for devising an effective and feasible TDNF-FF algorithm.

AP 9  The purpose of this paper is to propose a new ray representation of electromagnetic field in a circular HDW, which gives not only the physical substantiation of the method, but a technique to approximately evaluate the dimensions of the measurement area where the object should be put.

NS 4  The objective of this study is to compare the emission image quality of the OHS with HCB collimators, the RAS with HCB collimators and the RAS with OCB collimators.
The aim of this work is to propose a new test procedure dedicated to lot acceptance of an hardened BiCMOS technology.

The purpose of this investigation is to explore the feasibility of dual, stacked-IUSD units for use in intraoperative beta probes.

The objective of this paper is to present a new algorithm for coherency recognition, based on epsilon decompositions of the Jacobian which arises in transient stability analysis.

The contribution of this paper is a practical algorithm for topology error correction that is based on the use of normalized Lagrange multipliers for the identification of topology errors.

As can be seen from the quoted examples, there is a marked predominating structure of Subject-Prepositional Phrase-Verb-Infinitive employed by the authors to signal this move as indicated in the example that follows on the next page:
<table>
<thead>
<tr>
<th>Subject</th>
<th>Prepositional Phase</th>
<th>Verb</th>
<th>Infinitive</th>
<th>Complement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The purpose aim</td>
<td>of this paper study work</td>
<td>is</td>
<td>to describe to apply to</td>
<td>propagation experiments optimal</td>
</tr>
<tr>
<td>objective</td>
<td>investigation</td>
<td></td>
<td>propose to compare</td>
<td>interpolations a new ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>to explore to present</td>
<td>representation the emission</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>quality the feasibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a new algorithm</td>
</tr>
</tbody>
</table>

This regularity in patterning is reminiscent of a substitution table used to reinforce structuring of the various elements of a sentence. However, PS2 is a slight departure from this way of sentence patterning in its author's preference for the subject-prepositional phrase-verb-complement type of structure.

The 2 IEEE examples illustrating the 'purposive' or teleological type of the verbals are:

MTT 1  To minimize the disadvantage introduced by these discontinuities, a novel approach is examined.

BE 8  A simple method is presented for obtaining the parameters with the preamplifications connected to the T/R switch and the NMR system, if desired.
It is noted that the present tense in the passive form is used in the teleological verbals although there are too few examples to generalize on the pattern of structuring of the sentence.

With regard to the LA introductions, there are only 3 teleological or purposive third moves that are nominal as shown:

LA 3  *Thus the aim of the paper is to demonstrate the use of the fast second order Newton-Raphson (SONR) loadflow method*¹⁰ *in the security analysis as well as for generation rescheduling and/or load shedding following a contingency.*

LA 4  *The objective of this paper, therefore, is to describe an experimental example of the design of a simple and fast flash encoding ADC that incorporates the time-sharing concept.*

LA 16  *The purpose of this work is to design and build a double ac apparatus for electrical characterization and type determination of semiconductor wafers.*

On analysis, the predominating structural pattern of subject-prepositional phrase-verb-infinitive-complement emerges as shown in the following example:
<table>
<thead>
<tr>
<th>Subject</th>
<th>Prepositional Phrase</th>
<th>Verb</th>
<th>Infinitive</th>
<th>Complement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The aim</td>
<td>of the paper</td>
<td>is</td>
<td>to demonstrate</td>
<td>the use of ...</td>
</tr>
<tr>
<td>objective</td>
<td>this work</td>
<td></td>
<td>to describe</td>
<td>an experimental example</td>
</tr>
<tr>
<td>purpose</td>
<td></td>
<td></td>
<td>to design and build</td>
<td>a double ac apparatus ...</td>
</tr>
</tbody>
</table>

However, the purposive type of third moves is not as popular as the descriptive type as the grammatical construction of the former is more complicated than in the case of the latter.

(ii) **Descriptive Type**

Purposive statements of the descriptive type may be characterized by the ‘this’ signal or the locative phrase ‘in this paper’. There are 16 IEEE instances that utilize the ‘this’ signal. Examples of this type are:

**AP 4** *Connected with unbounded anistropic or biisotropic spaces, this paper studies diffraction of plane waves obliquely incident on embedded vanishingly thin perfectly conducting strips of infinite length.*

**AP 5** *The current paper will focus on the resonant properties of dielectric spheres.*
AP 5  This paper investigates much more general situations and also provides some physical understanding of the resonances associated with dielectric spheres and bubbles.

MTT 1  This paper reports the first study of the S-parameters of a dielectric waveguide discontinuity including high dielectric material over a wide band of frequencies.

MTT 7  This paper deals with transistor selection for the VCO circuit of Fig. 3 used in next-generation high-frequency mobile communication.

MTT 8  This paper describes the numerical methods used in the KUEMS, followed by comparisons of the numerical results among the three different formulations, i.e. with H/r, H, and rH, to show the advantageous features of this new formulation with H/r with respect to accuracy in the eigenfrequencies, and convergence of the electric field on the symmetry axis.

NS 5  This paper reports on the design fabricated and testing of a new type of floating gate MOSFET dosimeter which can be manufactured in a conventional commercial CMOS process, and which provides good sensitivity for zero gate bias operation.
This paper extends this idea considerably to use instantaneous eigenvalues along a trajectory to derive control strategies.

This paper proposes an algorithm to calculate the indices for the operating states both at system level and at individual bulk points with minimum possible memory requirements.

So, this paper describes an approach for creating a cooperative expert system for planning, where the expert system performs some tasks from the planner and at the same time, the planner can interfere in the planning process.

This paper applies the methodology developed to an analysis of two hypothetical wind farms, totaling 1500 MW, in New England. This paper discusses both of this windpower analysis, the hourly windspeed data preparation and the calculation of the potential impact of windpower electricity generation in New England.

The descriptive type of third moves is interesting for several reasons.

First, it can be regarded as a collapsed structure in which we can insert the locative and an agent as in the following example:

...in this paper, we study diffraction of plane waves obliquely incident on embedded vanishingly thin perfectly conducting strips of infinite length.
Second, all the occurrences of this third move type are in the present tense except for AP5 which uses the future tense. Third, the type of presentation as the opening noun uses 1 type of presentation or inquiry, 'paper'. Fourth, only references to the product and not the authors are made.

However, there are 7 instances where the locative phrase, in the initial position of the sentence, is used preceding the pronoun 'we', as in the following examples:

PS 7  In the paper, we will propose 2 fast textured algorithm for the OPD problem.

BE 1  In the present paper, we propose an analysis – synthesis method that is suitable for time-frequency scaling transformations and applicable to both the transient property of the heart sounds and random property of the heart murmurs.

BE 2  In this paper, we first introduce three types of transformation: time-scaling, frequency-scaling, and joint time-frequency scaling.

BE 3  In this paper, we begin by identifying a Hammerstein model of the plantarflexors of an intact human, stimulated by surface electrodes.
In this study, we examine the long-term performances as well as the tissue response of active and passive miniature stimulators.

In the present study, we have explored the hypothesis that the intramuscular locus of muscle stimulation has a significant effect upon the distribution of active motor units and the strength of muscle contraction.

In this paper, we propose a method for slow time-varying posture and slow motion based on a single trial that is capable of identifying the time-varying joint mechanical properties and does not have the intertrial variation issue.

It is noted that this type of structuring is a popular practice among authors of the BE introductions. The tense used after the pronoun subject 'we' is generally in the present though it can be expressed in the future tense as in PS7, or in the present perfect as in BE6. An instance where the locative phrase is located at the end position of the sentence is:

A novel approach to STLF using fuzzy neural networks is presented in this paper.

In this particular IEEE example, the locative phrase is positioned at the end of the sentence as a complement to signal the fact that the transition to the third move has been sufficiently conveyed by the subject and the verb.
Where the LA introductions are concerned, there are 8 distinct instances that utilize 'this' or 'the present' in the third moves. LA examples of this type are:

**LA 1** *This paper presents a technique for simulating fault conditions in a power network based on the phase coordinate model by Laughton and using the second order Newton Raphson algorithm as a solution technique.*

**LA 2** *Thus this paper will serve to introduce the basic ideas and show their practical application to the local power distribution system.*

**LA 3** *In order to be able to judge or decide on the level of reliability, some means of quantifying it must be known and this paper is aimed at presenting such a technique.*

**LA 4** *As a general objective, it is hoped that this paper will demonstrate to graduating students and new students, a number of design hints in the use of analogue and digital IC's as building blocks in electronic circuit design.*

**LA 15** *The present paper extends this to the use of other polarities and shows that advantage can be gained by this in many cases.*
The present paper suggests two new methods for testable design of PLAs.

This paper is intended to create an awareness in the industry on the importance and manner rotor dynamics analysis can help improve the reliability of machinery.

The present paper describes the development of a two-dimensional on SI plane, time-accurate inviscid Euler solver for turbomachinery applications.

As is evident from the above list, the indicative phrase starting with 'the present' or 'this paper' is most popularly found in the initial position of the sentence of 6 instances. In contrast to this, the same indicative phrase is located in the 'that' clause after the verb in a single instance and yet in another where it initiates the clause joined to another by the conjunction 'and'. The active form of the present tense is preferred by most authors though there are 2 instances of the use of the passive form of the present tense and a single instance of the future tense. It is also noted that there is a rare instance where a connector 'thus' precedes the indicative phrase. The purposive third move can be regarded as a collapsed structure when the locative 'in' and the agent 'we' are inserted. The 'product' that is the paper, and not the 'producer' or the author, is usually referred to.
There are 5 LA instances where the locative phrase 'in this/the present paper/work' is used. They are as follows:

LA 2  Despite this, the examples presented in this paper using the borrowed data will serve to illustrate how important reliability engineering is to current planning practice.

LA 4  In this paper, a simple simultaneous conversion or sometimes referred to as flash encoding ADC is described.

LA 8  In this paper, the use of such physical processes modelling will be detailed.

LA 17 In this paper, the back-propagation algorithm is investigated and its suitability as a learning algorithm for different control schemes is explored.

LA 20 Because of these advantages, the finite-volume time-marching method is used in the present work.

From the LA examples shown, it is noted that the locative phrase 'in this paper' is mainly found in the initial position in 3 instances though it also found in 1 instance in which it is attached to the subject, and in another, where it is located in the final position of the sentence. It may be reasoned that when the locative phrase occurs in the initial position, it signals the transition from other
moves to the final one, and when it occurs in the final position, it indicates that the transition has been sufficiently indicated by the preceding subject and verb. The passive form of the present tense is most popularly used as opposed to a single instance of the future tense in the active form and another, of the same tense, in the passive form.

4.5.3 Introductions Opening with Move 3

The option of opening with a Move 3 in the introduction is not a common feature in the IEEE corpus as compared to the 10 instances in a corpus of 110 introductions as observed by Swales and Najjar (1987), (cited by Swales, 1985,p.165) This deliberate doing away with the first and second moves in preference to getting down to Move 3 has prompted Swales to caution against the ‘perils of failing to engage the wider discourse community by a too narrowly focused opening’. By this he is implying its appeal to a limited specialist audience, for example in power systems at the cost of the disengagement of the larger specialist audience of that of electrical and electronics engineering. However, it is interesting to examine the rationale behind introductions that open with a Move 3 by analysing BE4.

BE 4 We present a new model for complex physiologic systems which undergo state (phase) transitions. The physiologic system modeled is the central nervous system (CNS), and the global behaviour captured by the model is the state transition from consciousness to unconsciousness. Loss of consciousness (LOC) can result from many
conditions such as ischemia (no blood flow), hypoxia (no oxygen), hypoglycemia (critical lack of glucose), seizure, anesthesia, or a blow to the head, among others [1]. Successful development of a model for this complex requires careful combination of basic knowledge of the physiological system both at the local (microscopic) and global (macroscopic) levels with experimental data and the appropriate mathematical tools. Due to the wealth of human research and data available, the specific focus of the model is unconsciousness that results from the cerebral ischemia experienced by aircrew during aggressive maneuvering in high-performance aircraft [2].

In BE4 as shown above, the introduction opens with Move 3 Step 1, thus deviating from the accepted procedure in article introduction writing. This introduction is composed differently as the authors are not using conventional or traditional computational methods or mathematical models but recent mathematical methods to describe the processes involved in the dynamism of complex physiologic system. This novelty in processing would most probably merit an alternative convention to embody the genre.
With reference to the LA introductions, it has been found that the following contains the only introduction that opens with a Move 3 instead of a Move 1:

LA 6 The switching operations for restoration of supply after every occurrence of forced outage on the system, are fully modelled so that the outage duration of each event can be more realistically quantified to give a measure of the mean duration of the outage of a feeder. The other four reliability indices can be deduced based on the reliability concepts. Preventive maintenance can increase the in-service availability of the electrical equipment and in practice maintenance on each substation is done according to a planned schedule. Computational efforts are carried out to model maintenance practice.

The studies are extended to include considerations for network changes. Various simulations of changes on feeders are carried out to assess the effects of each alteration on the reliability of distribution system. Amongst these assessments are:

(1) Simulations of single radial feeder with each having a single source of alternative supply. The reason for inclusion of this type of feeders in these assessments is due to the fact that such feeders exist in great number in practical distribution systems.
(2) Simulations of consumer-oriented networks, i.e. feeder networks having haphazard topologies due to the tendency of the supply authority extending supply to newly sprung up load centres and not taking the topology networks into account.

Throughout these assessments, the relationship between the number of sources of alternative supply and the reliability of distribution system is sought in addition to the search for the most reliable feeder.

It is felt that doing away with a Move 1 as in the LA introduction above, results in a certain abruptness in the presentation where the provision of some background would certainly help to orientate the non-specialist readers in the field. However, this is a rare practice among the local authors as there is very little research of the kind of novelty that merits a novel way of starting the introduction.

4.6 Rationale of Move 3 Step 2 (Stating Present Research/Sequence of Events)

This move-step is generally observed to succeed Move 3 Step 1 or the statement of purpose. It is analogous with practice, as Move 2 Step 1, is with theory. Hence, Move 3 Step 2 is complementary to Move 2 Step 1. More importantly, it specifies aspects of the theory that are especially important to
the author's investigation. Thus this is the move-step that occurs most frequently in the entire Move 3 as it helps to elucidate the derivation of results.

4.6.1 Three Types of Statements on Present Research- Summative, Evaluative and Commentative

In stating present research, it is found to comprise 3 types of statements in presenting research: summative, evaluative and commentative. However, where there is no clear occurrence of this move-step, it is implicitly referred to in other move-steps in Move 3. The different types of Move 3 Step 2 are be tabulated as follows:

Table 4.12
Distribution of Four Types of Statements in Presenting Research in Move 3 Step 2 (I.E.E.E.)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Summative</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>10 (21.3%)</td>
</tr>
<tr>
<td>Evaluative</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>14 (29.8%)</td>
</tr>
<tr>
<td>Commentative</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>15 (31.9%)</td>
</tr>
<tr>
<td>Implicit</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>8 (17%)</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>47 (100%)</td>
</tr>
</tbody>
</table>
Of the 3 types of statements used in presenting research, there is a total of 9 instances of the summative type, 1 instance of the evaluative type and 3 instances of the commentative type. These are usually expressed in the active or passive form of the present tense.

(i) Summative Type

The summative type of the move-step summarizes and includes the process as a whole in stating the main steps. From Table 4.8, it is clear that only a fifth of the total instances constitutes this particular type. Some of the IEEE examples found are:

AP 8 In this paper, the direct and reflected fields radiated from the real dipole antenna and its images (including the quasi-dynamic images and complex images) in the four layer stratified model are derived in closed form. Also, the lateral waves propagating along the interfaces I,II and III are obtained and expressed in closed form. Both horizontal and vertical polarizations of the dipole are considered. For the communications inside the forest, the distances between transmitter and receiver is much larger than the wavelength so that the fields in the stratified structure are described by only the lateral wave on the air side along the air-canopy interface.
Transmission losses of the waves are also computed, by using the field configuration developed.

NS 6 With these ideas in mind, we bring our work on the gamma-radiation hardness of three different types of commercially available optical fibre temperature sensors, by comparing their behaviour during a 114Gy h-1 (+5%) spent fuel irradiation, combined with regular temperature cycling. One sensor type is also evaluated for use in nuclear environment.

In the IEEE examples shown above, it can be seen that the amount of material to be included in the process varies with the writer. For instance, AP 8 may involve unusual detail that calls for detailed explanation of the process in a series of steps all of which are expressed in the passive form of the present tense; in contrast to this, the brevity of the process in NS6 as seen in the use of a single instance of the active form of the present tense, ‘bring’, and a passive form of the same tense, ‘is evaluated’, may be due to the inclusion of steps either of which the specialist reader already understands or that they are recognized, standard procedures.

This type of move-step carries a conclusion that summarizes the process. LA examples of this type are as follows:

LA 2 Typical power distribution networks which resembles that of the Kuala Lumpur distribution network will be analysed. Certain modifications
to the substation configuration will be made and a reliability analysis done and the results are compared. Significant improvements in the overall performance of the networks will then be shown for these different arrangements. Based on this procedure, the local power distribution network can be reviewed, and improvements be made, to improve the systems performance.

LA 4 In this paper, a simple simultaneous conversion or sometimes referred to as a flash encoding ADC is described. It uses a bank of comparators to distinguish 16 conversion levels which are then encoded into 4 digital bit. Further lower order 4-bit tuples are obtained via a feedback logic path that makes use of the same simultaneous conversion comparators over a number of cycles. The number of cycles determines the resolution of the digital number. Ideally, the flash encoding technique provides for a simultaneous and thus extremely fast analogue-to-digital conversion of signals.

As indicated in the LA examples above, a conclusion has been included towards the end of the explanation of a process so as to reinforce the impression of viewing the process as a whole rather than in parts. It is also noted that the passive form of the present tense is mainly used.
(ii) Evaluative Type

The evaluation type states the amount or value of the process or the results of the process. It comprises about 30% of the total IEEE instances (Table 4.7), the examples of which are as follows:

MTT 4  In this method, a microwave active circuit is divided into linear components and nonlinear devices. Since the nonlinear devices in the microwave circuits are typically very small in size compared to a wavelength, they can be modelled by their lumped equivalent circuits with a high degree of accuracy. The linear components are usually characterized with scattering parameters, which relate the incident and reflected waves at ports. However, for the FDTD computation of scattering parameters, the incident waves have to be calculated in advance on transmission lines or waveguides, which are the same as those that made up the ports of the network. For some components of microwave active circuits, which do not have ports with transmission lines or waveguides, it is difficult to calculate the incident waves. Besides, except the excitation port, all ports have to be terminated by matched loads when calculating the reflected waves. It means that non-reflected truncated boundaries should be imposed on the posts.

NS 4  If one of the RAS's would result in similar emission image quality compared to the OHS, it would then be more attractive to perform
simultaneous ECT-TCT imaging. The above described systems were simulated and a parallel-hole system was used as a reference. For all experiments, it was assumed that the attenuation maps were known.

It is noted from the IEEE examples given that the move-step can be mainly written either in the passive form of the present or past tense in conveying results of the process.

An LA example of this purposive type is as follows:

LA 18 The present paper suggests two new methods for testable design of PLAs. Both require augmentation of the PLA structure as in a majority of testable proposals. In one, the provision of an extra output line permits a reduction in storage requirements of output responses. In the other, a grouping method on product lines leads to a considerable reduction in the number of tests required.

From the LA example shown, it can be seen that the implications of increase or decrease in size are suggested by the use of words like 'augmentation', 'reduction' and 'considerable reduction'. In addition, it is noted that active form of the present tense is mainly used.
(iii) Commentative Type

The commentative type explains why the process is important, or indicates how it fits into the present investigation. It constitutes the largest number of instances found in the IEEE introductions (Table 4.7). Examples illustrating this type of materials found in the move-step are as listed:

MTT 3  We utilize the principle of causality to do non-minimum phase realizations. The principle of causality implies that the function \( f(t) \) = 0 for \( t < 0 \) and is nonzero otherwise. It is important at the onset to point out that the phase realization (be it minimum or non-minimum phase) is not a unique problem. A linear-phase term may be added to any phase function without altering its amplitude is equivalent to a pure delay in the time domain. Since we are dealing with linear-shift invariant systems (as the response of the system is the same independent of the time origin), changing the impulse response of the system by a time shift does not alter the transfer function of the original system, except that the phase spectrum is modified by a linear-phase function. The slope of this linear-phase function is equivalent to the time delay. Also, the amplitude spectrum of the transfer function is unaltered by providing a delay to the impulse response of the system at hand.

PS 9  The algorithm has been tested with real dimensions distribution systems that have larger dimensions than the ones usually found in
technical literature. Novel operators of the genetic algorithm have been developed, that allow for getting out of local optimal solutions and obtaining the global optimal solution or solutions very close to such an optimal one. The algorithm considers the true non-linear variable cost and it also obtains the distribution nodes voltages and an index that gives a measure of the distribution system reliability.

In the 2 IEEE examples considered above, it can be seen that MTT 3 attempts to explain why the process is an important or a common one as suggested by 'not unique' using mostly the active or passive modes of 'to be'. While PS 9 is more concerned with how the process fits in with the overall investigation in pointing out what the algorithm can do as suggested by the verbs 'considers', 'obtains' and 'gives' and to do this, the passive form of the present perfect and present tenses have been mostly employed.

LA examples of the commentative type are as follows:

LA 8 In this paper, the use of such physical processes modelling will be detailed. Also, the primary fabrication processes which determine the electrical characteristics of semiconductor devices, in particular silicon devices, are the physical processes of ion implantation and diffusion. Epitaxy, deposition, lithography, etching and oxidation can certainly play an essential role in device fabrication as well. However, as the field of process modelling is very wide and difficult, only ion implantation and dopant diffusion will be discussed.
Methods are developed using the initial unmodified Jacobian matrix to simulate any of the fault conditions. Some modifications are made to the solution process in order to speed up the convergence and the overall effect adds up to a fast and exact technique, making it attractive for use with transient stability studies.

In the LA examples quoted, it is clear that comments or opinions in explanation of the process are embedded in the use of the adjectives 'wide', 'difficult' and 'attractive' and they are usually expressed in the active form of the present tense in contrast to the passive form of the same tense in describing the process.

4.7 Rationale of Move 3 Step 3 (Stating Results)

The insertion of this move-step will certainly help to make a more complete introduction though there is a tendency for the majority of the authors to high-light their results in the abstract itself. As this appears to be a stipulated practice in the IEEE and local publication guides, Move 3 Step 3 is unsurprisingly non-existent in 82% of the IEEE, and 95 % of LA, article introductions. Indeed, only a single LA instance of this move-step out of the entire corpus is found. Despite this, it is deemed appropriate to include the principal result in the introduction itself as the latter is regarded as a 'miniature' article, a complete entity that can be read on its own.
4.7.1 Two Types of Statement of Results – Use of Third and First Persons (We)

Two types of statement of results can be identified as in the use of two classes of personal pronouns, the third and first person.

(i) Use of Third Person

Below are 3 IEEE examples in which the move-step is expressed in the third person:

**BE 9** These FDTD simulations indicate that the electromagnetic field exposure non-uniformity is potentially significant for both the cases of the culture dishes resting on the septum and perpendicular to the septum.

**MTT 2** It is shown here that the different choices of path in the transverse wavenumber plane give rise to branch cuts in the longitudinal wavenumber plane for the integration in $k_2$ that determines the numerical Green's function. A careful consideration of these branch cuts provides much insight into the physical meaning of the leaky modes that are excited by the source, corresponding to the poles in the $k_2$ plane.
MTT 4  *Good agreements are found when the simulated results are compared with direct FDTD simulations.*

From the above examples, it is clear that the present tense in the 2 modes has been employed. BE 9 is in the active voice, while MTT 2 and MTT 4 are in the passive voice.

Below is the sole example found in the LA sample:

LA 3  *The results are shown to be useful for the judicious planning of modern electric power systems.*

It is noted that this move-up is expressed in the third person, in the passive form of the present tense.

(ii)  **Use of First Person ‘We’**

The use of the plural form of the first person, ‘we’, is evident in the following 6 IEEE instances:

PS 2  *We show that, in the absence of gross measurement errors and constraint errors, the Lagrange multipliers are zero mean random*
variables whose variances can be efficiently computed directly from the sparse tableau coefficient matrix factors.

PS 2  We give a simple proof that when all measurements and constraints are perfect, except for one bad datum, then the largest normalized Lagrange multiplier corresponds to the bad data point.

PS 5  We have first-hand experience of the tremendous potential that Ctt has for solving 'number-crunching' power engineering problems.

PS 5  We have found good programming practices to be the key to fast OOP applications.

PS 5  We have also experienced the great flexibility and accelerated production cycles that the OOP philosophy can afford.

BE 5  Our results showed that active and passive miniature stimulators elicit similar, benign foreign body reactions that progress to form essentially identical fibrous capsules over time. This reaction did not appear to interfere with the functionality of the device because thresholds measured during chronic implantation did not change significantly over time. We did find, however, that the severity of the reaction appeared to differ amongst the various host muscles.
In the IEEE examples given, there are 3 instances when the present tense is used, 2 instances in which the present perfect is used while a single instance of the use of the past tense can be found. Thus, while there is no fixed tense to be used, the present tense is still the preferred tense for the IEEE authors. As regards the LA introductions, there is not any instance in the first person 'we'.

4.8 Rationale of Move 3 Step 4 (Stating Organizational Structure)

The purpose of this move-step is mainly to convey the organizational structure of article towards the end of the introduction as a kind of summation device. However, not all authors feel the need to include the move-step in their writing as it is found that the organizational structure is implicitly carried in Move 3 Step 1 or the purpose in 68.6% of the IEEE introductions (Table 4.11). Indeed, 65% of the local article introductions have been found to carry such a combination for purposive as well as organizational conveyance. Yet 25% of the local article introductions do not contain a Move 3 Step 4 since publication guides are more concerned with the paper evidencing overall plan and organization as in the use of main and sub-headings than in an organizational contrivance confined to the introduction section alone.
4.8.1 Three Types of Statement on Organizational Structure

It is found that this move-step can be expressed in 3 ways: use of a locative phrase, use of a collapsed structure and a combination of both as in Table 4.9. The use of an initial preposition ‘in’ in the locative phrase appears to be the most popular choice among the I.E.E.E. authors. In the case of the LA introductions, only two main types of statements can be identified as in the use of the collapsed structure and the locative phrase.

Table 4.13
Frequency Distribution of Ways of Conveying Organizational Structure in Move 3 Step 4 (I.E.E.E.)

<table>
<thead>
<tr>
<th></th>
<th>No. of AP Introd</th>
<th>No. of BE Introd</th>
<th>No. of MTT Introd</th>
<th>No. of NS Introd</th>
<th>No. of PS Introd</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Locative Phrase</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Use of Collapsed Structure</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Combination - Locative Phrase / Collapsed Structure</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Implicit Organization</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
<td>Absence of M3-S4</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>
Use of Locative Phrase

2 IEEE instances where the locative phrase 'in section x' is used are shown:

AP 6  *In Section II, two near-field transformation computational schemes based on the optimal sampling representation are introduced and discussed. The main results of an extensive numerical analysis, which show also the possibility of minimizing the size of the scanning area, are reported in Section III wherein both far-field time-signal reconstruction and frequency-domain radiation pattern evaluation are considered. Conclusions are drawn in Section IV.*

BE 2  *In this paper, we first introduce three types of transformation: time-scaling, frequency-scaling, and joint time-frequency scaling. In Section III, the PCG data base and a quantitative valuation of the scaling transformations is described. Then, the scaling transformations are applied in Section IV to normal and pathological PCG's signals. The results are evaluated by quantitative analysis in the time and the time-frequency domains, visual comparisons of time-frequency representations (TFR's), and auditory appreciation. The TFR's of the PCG's are computed with two methods: the spectrogram of the signal and the MO-based Wigner distribution as described in Section II. Finally, a discussion and a conclusion are presented in Section V.*
In the IEEE examples shown above, the locative phrase ‘in section x’ is found in the initial or final position of the sentence. Further, the passive form of the present tense is used in both AP6 and BE2.

The only other LA instance that shows the use of a locative phrase is:

LA 18 *The rest of the paper is organized as follows: in section 2 we discuss different fault models for PLAs. The first proposed PLA design is presented in section 3; in section 4 the second proposed design is presented together with a combinatorial method for assigning product terms to groups. Section 5 presents a comparison of the proposed methods with others proposed in literature and section 6 contains some concluding comments.*

From the examples shown, it is interesting to note that both types of organizational structures are initiated by a rather standardized signalling clause whose component parts can be analyzed as following example:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Prepositional Phrase</th>
<th>Verb</th>
<th>Adverbial Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>The remainder</td>
<td>of the paper</td>
<td>is organized</td>
<td>as follows</td>
</tr>
<tr>
<td>The rest</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In addition, it is noted that the passive form of the present tense is also commonly used.

(ii) Use of Collapsed Structure

This way of structuring the organizational structure allows the use of a non-human agent as the subject of the verb. Its appeal lies in the relative ease in constructing a crisp statement that is not elongated by locatives and passive forms. Perhaps it may even be regarded as one of the stylistic accommodation devices in depicting the dynamism of the technology of the sub-discipline. The following example abounds with such a collapsed structure in constructing of Move 3 Step 4:

BE 4 Section I introduces some of the recent mathematical methods that are useful in describing the processes involved in the dynamics of complex physiologic systems. Section II provides a brief overview of the physiology of consciousness. Section III describes the rationale for using percolation theory as the framework for the model. Sections IV and V explain the computational details of the model followed by a comparison of the human data to the predictions made by the model. We conclude with speculations about future extensions of the method presented in this paper.
One of the 2 LA instances found in the entire local corpus shows the use of a collapsed structure as follows:

LA 15 The remainder of the paper is organized as follows: Section II describes some properties of RM coefficients and also methods for generating them. Detection of stuck-at and bridging faults at inputs is discussed in Section III and internal faults in Section IV. Section V outlines applications to testing PLAs.

(iii) Use of Combined Locative Phrase and Collapsed Structure

A single instance in which 2 different ways of structuring the organization is found in the IEEE example below.

MTT 3 In Section II, we present the more general amplitude-phase relationship of a non-minimum phase system on the principles of causality. In Section III, the computational method is outlined. In Section IV, we describe the numerical implementation of this technique. Section V describes how this technique can be applied for the realization of non-minimum phase from the field power patterns. Typical numerical results are presented in Section VI, followed by a conclusion in Section VII.
In MTT3 as shown above, the active form of the present tense is mostly used after the pronoun subject ‘we’. However, the expression ‘Section V describes’ can be viewed as a collapsed structure, as it basically comprises a locative ‘in’ and an agent ‘we’ — both elements of which, when located would read as in the following: ‘In section V, we describe …’. Thus, it is generally observed that in employing a Move 3 Step 4, the author invests a note of finality to the introduction, giving the impression that there is definitely nothing more to be said or done at this final stage of his writing of the introduction.
4.9 **Distribution of Move-Steps**

Below are the results of the distribution of the move-step/moves in the I.E.E.E. introductions and the parallel publication guide reference:

**Table 4.14**

**Distribution of Move-Steps in I.E.E.E. Introductions and Corresponding Publication Guide References**

<table>
<thead>
<tr>
<th>Move-Steps of 3 Moves</th>
<th>Corresponding References in the I.E.E.E. Power Publication Guide (1995)</th>
<th>No. of AP Introd</th>
<th>No. of BE Introd</th>
<th>No. of MTT Introd</th>
<th>No. of NS Introd</th>
<th>No. of PS Introd</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 - S1 (Establishing Centrality)</td>
<td>Explain how and why the subject is of interest. This is particularly relevant when the paper is highly theoretical. Be as specific as possible.</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>5</td>
<td>9</td>
<td>37 (74%)</td>
</tr>
<tr>
<td>M1 - S2 (Literature Review)</td>
<td>Is the work new? How close is it to previously published work by the present authors, or by others?</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>45 (90%)</td>
</tr>
<tr>
<td>M1 - S3 (Establishing a Gap)</td>
<td>Is the paper proposing an improvement on a previously used technique? Practical techniques would be helpful.</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>42 (84%)</td>
</tr>
<tr>
<td>M2 - S1 (Defining Scope/ Explaining Method)</td>
<td>What exactly is the improvement expected? Identify the future advances required to realize the full potential of the proposed technique.</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>47 (94%)</td>
</tr>
<tr>
<td>M3 - S1 (Stating Purpose)</td>
<td>Implicit</td>
<td>8</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>45 (90%)</td>
</tr>
<tr>
<td>M3 - S2 (Present Research/ Sequence)</td>
<td>Are there any practical tests that have been performed or planned? Will these be through simulations, laboratory experiments, or field tests?</td>
<td>8</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>43 (86%)</td>
</tr>
<tr>
<td>M3 - S3 (Stating Results)</td>
<td>Not mentioned</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>8 (16%)</td>
</tr>
<tr>
<td>M3 - S4 (Organizational Structure)</td>
<td>Not mentioned</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>28 (56%)</td>
</tr>
</tbody>
</table>
From Table 4.14, it can be seen that there is a close relation between the insertion of a move-step with its corresponding comment found in the publication guide. In other words, where the publication guide makes an explicit or implicit reference that can be equated with a particular move-step, the chances for its occurrence in the I.E.E.E. introductions are higher than in the absence of any mention of it in the guide; this is evidenced in the low percentage of I.E.E.E. introductions in connection with Move 3 Step 3 and Move 3 Step 4 as shown in Table 4.14. However, this does not mean that there will be a one hundred per cent occurrences of a particular move-step in the introductions even if there were an allusion to it in the publication guides; in the case of Move 1 Step 2, only 74% of the total instances can be found, hence, the authors of the rest of the introductions can be assumed to have used the bibliography to list their references.

In the case of the L.A introductions, the distribution of the move-steps in relation to their respective moves alongside comments made on the introduction in accordance with the Institution of Engineers Malaysia (I.E.M.) publication guide is investigated. The results have been summarized on the following page.
<table>
<thead>
<tr>
<th>Move-Steps of Moves 1, 2 &amp; 3</th>
<th>Corresponding Comments on the Introduction from the IEM Publication Guide</th>
<th>Present in No. of LA Introductions (%)</th>
<th>No. of Sentences in Move-Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1-S1 Establishing Centrality</td>
<td>The introduction ... should include the significance of the paper.</td>
<td>16 (80%)</td>
<td>24</td>
</tr>
<tr>
<td>M1-S2 Literature Review</td>
<td>The introduction ... should include the background of previous work</td>
<td>16 (80%)</td>
<td>50</td>
</tr>
<tr>
<td>M1-S3 Establishing A Gap</td>
<td>The introduction ... should include the nature of the problem.</td>
<td>12 (60%)</td>
<td>39</td>
</tr>
<tr>
<td>M2-S1 Defining Scope or Explaining Method</td>
<td>The method by which the problem will be attacked ... may also be included.</td>
<td>19 (95%)</td>
<td>138</td>
</tr>
<tr>
<td>M3-S1 Stating Purpose</td>
<td>The introduction ... should include the purpose of the paper.</td>
<td>11 (55%)</td>
<td>12</td>
</tr>
<tr>
<td>M3-S2 Sequence of Events/ Present Research</td>
<td>Implicit</td>
<td>16 (80%)</td>
<td>44</td>
</tr>
<tr>
<td>M3-S3 Stating Results</td>
<td>Not mentioned</td>
<td>1 (5%)</td>
<td>1</td>
</tr>
<tr>
<td>M3-S4 Organizational Structure</td>
<td>The organization of the material ... may also be included.</td>
<td>12 (60%)</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>-</td>
<td>314</td>
</tr>
</tbody>
</table>
As can be seen from Table 4.15, there appears to be a greater likelihood in occurrence of a move-step with than without a specific mention, as in Move 3 Step 3, in the publication guide. Thus, apart from an implicit instance as in Move 3 Step 2, all the move-steps, except Move 3 Step 3, have been realized though this does not imply a 100 per cent occurrence in practice as is evident in Move 1 Step 1, Move 1 Step 2, Move 1 Step 3, Move 2 Step 1, Move 3 Step 1 and Move 3 Step 4.

4.10 Length of Moves

This section discusses the lengths of the 3 moves. Table 4.15 summarizes the distribution of sentences found in the I.E.E.E. introductions.
Table 4.16
Sentence Distribution in the I.E.E.E. Introductions

<table>
<thead>
<tr>
<th>Move-Steps in 3 Moves</th>
<th>No. of Sentences in AP Intro.</th>
<th>No. of Sentences in BE Intro.</th>
<th>No. of Sentences in MTT Intro.</th>
<th>No. of Sentences in NS Intro.</th>
<th>No. of Sentences in PS Intro.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move 1: Problem Definition</td>
<td>9</td>
<td>9</td>
<td>13</td>
<td>5</td>
<td>14</td>
<td>50</td>
</tr>
<tr>
<td>Step 1: Establishing Centrality</td>
<td>44</td>
<td>63</td>
<td>50</td>
<td>46</td>
<td>58</td>
<td>261</td>
</tr>
<tr>
<td>Step 2: Literature Review</td>
<td>22</td>
<td>37</td>
<td>25</td>
<td>24</td>
<td>23</td>
<td>131</td>
</tr>
<tr>
<td>Step 3: Establishing a Gap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>75 (10.4%)</td>
<td>109 (10.4%)</td>
<td>88 (7.2%)</td>
<td>75 (7.2%)</td>
<td>95 (7.2%)</td>
<td>442 (42.3%)</td>
</tr>
<tr>
<td>Move 2: Solution Assumption</td>
<td>52</td>
<td>80</td>
<td>44</td>
<td>56</td>
<td>54</td>
<td>286</td>
</tr>
<tr>
<td>Step 1: Defining Scope</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Or Explaining Method of Investigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>52</td>
<td>80</td>
<td>44</td>
<td>56</td>
<td>54</td>
<td>286 (27.4%)</td>
</tr>
<tr>
<td>Move 3: Solution Presentation</td>
<td>9</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>11</td>
<td>51</td>
</tr>
<tr>
<td>Step 1: Purpose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2: Sequence of Events/ Present Research</td>
<td>20</td>
<td>44</td>
<td>52</td>
<td>34</td>
<td>40</td>
<td>190</td>
</tr>
<tr>
<td>Step 3: Results</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 4: Organizational Structure</td>
<td>0</td>
<td>12</td>
<td>4</td>
<td>0</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>TOTAL</td>
<td>37 (3.5%)</td>
<td>82 (7.8%)</td>
<td>78</td>
<td>50</td>
<td>69</td>
<td>316 (30.3%)</td>
</tr>
<tr>
<td>TOTAL (Moves 1, 2 &amp; 3)</td>
<td>164</td>
<td>271</td>
<td>210</td>
<td>181</td>
<td>218</td>
<td>1044</td>
</tr>
</tbody>
</table>

From Table 4.16, it is clear that the longest move is Move 1; this suggests that, in general, the I.E.E.E. authors are aware of the significance to establish centrality in face of the need of persuasion of the reader to read the article. In addition, the shortest IEEE move is Move 2, which suggests that a
greater emphasis is placed on explaining how the investigation has been carried out than dwelling on the assumption of a solution instead.

4.10.1 The Shortest Moves One, Two and Three

It is clear that Move 1 in the NS introductions is the shortest (7.2%) because there is less need to establish centrality as 50% of the NS introductions are supported in part or in full by the government or industry of the nations of the respective authors.

It is found that Move 2 in the MTT introductions is the briefest (4.2%) as compared to all the other sub-disciplines since in catering to a specialist audience, there is less need to define in great detail, terms like ‘leaky mode’ (MTT2), theories like the utilization of principles of causality and the Hilbert transform (MTT3), the use of nominalization like ‘FDTD’ (MTT4), ‘MMIC’ (MTT5), ‘PCB’ and ‘VCO’ (MTT7). The composition of the 3 moves expressed as a percentage in MTT1 will illustrate the point that Move 2 is the shortest of all the 3 moves.

It is noted that the shortest Move 3’s are those of the AP introductions (3.5%). This may be attributed to the fact that where the present investigation is concerned, the theory of the geometry of the problem or the derivation of equations using different approaches is mostly detailed in a separate section to inform specialist readers more adequately. Furthermore, only 20% of the AP
introductions devote some space to the explaining of the present investigation as compared to the statement of purpose in 80% of the AP corpus. In addition, Move 3 is further shortened with exclusion of the organizational structure in 70% of the AP introductions.

In the case of the LA introductions, it can be seen that the shortest move is that of Move 3 (20%). This is a possible outcome of the greater prominence given to Move 1 as compared to Move 3 by the local publication guide in that most of the questions posed to the referees are related to Move 1 and they are as follows:

(i)  *Is the topic important or interesting enough to engineers or theorists?*

(ii) *Is the central problem for the paper clearly stated?*

(iii) *Is there any reference to, or discussion of, related literature or studies by other researchers?*

(iv) *Are there enough references?*

The first two questions allude to Move 1 Step 1, while the second two, to Move 1 Step 2. It is evident that there does not seem to be any questions related to Move 3. Besides, in the wording of the I.E.M. style for preparation of papers, two of the three items that should be included in the introduction are those of Move 1 as in 'the nature of the problem', referring to Move 1 Step 1 and the 'background or previous work', which refers to Move 1 Step 2, leaving only one item, 'the purpose and significance of the paper', referring to Move 3.
Step 1. Hence, Move 3 is generally shorter than Move 1, making it the shortest move in the local article introduction.

4.10.2 The Longest Moves One, Two and Three

It is evident that the length of a move in the case of the BE sub-discipline, hinges on an awareness of the audience (to whom the communication is directed) and the purpose of the communication. For example, BE3 entitled ‘Investigation of the Hammerstein Hypothesis in the Modelling of Electrically Stimulated Muscle’ is effectually illustrative of this observation in that it appears to be the lengthiest in all of the 3 moves. This is due to the fact that the authors are most keenly aware of who will be reading their material – electrical engineers whose interest lie in the field of functional electrical stimulation, biophysicists to whom the representation of nerve – muscle is seen as a 2 block model and mechanical engineers who are concerned with the designing of controllers. In this particular introduction, the length of Move 1 (10.4%) is due to the need to establish the deficiencies of the two-block model and then the deficiencies of the Hammerstein model; while the length of Move 2 (7.6%) is because of the need to define the two-block structure and its correspondence to biophysics and the length of Move 3 (7.8%) can be traced to a detailed procedural account of the experiments carried out. Therefore, is it obvious that the reason for such a meticulous presentation is that the authors are aware that their communication must be concise, accurate and understandable to all the different groups of readers intended.
As indicated in Table 4.16, the longest move for the local introductions appears to be that of Move 2 (44%). This is to be expected in view of the wide range of audience for whom the article has been intended-professional engineers in the industry as well as engineers of the academic profession. It is imperative, then, for the authors to make their work understandable to the different levels of readership by explaining not only the problem but the solution assumption in some detail. Moreover, the publication guide carries the exhortation for authors to simplify their work, resulting in a diffusion of the otherwise compact style in scientific writing.

4.11 Use of Predominant Tenses- Present, Present Perfect and Past

There are three predominant tenses that are used over and over again to the exclusion of almost all other tenses (Appendix 13). They are the present, present perfect and past tenses and their importance may be attributed to the different functions they serve in different moves as can be seen in the frequency of their use. To illustrate the different functions of the predominant tenses in the different moves of the IEEE and LA introductions, first, AP 7 (Appendix 2) and LA 3 (Appendix 5) will be analyzed in relation to the present tense; second, BE 7 (Appendix 3) and LA 17 (Appendix 7), the present perfect tense, and, third, PS 8 (Appendix 4) and LA 17 (Appendix 7), the past tense.
(1) **The Present Tense and Functions**

A matter of interest in connection with the use of the present tense is its versatility in the express conveyance of its different functions when used in each of the three moves. Because of this, it is most extensively used in the writing of article introductions. Indeed, it has been acknowledged by Huckin and Olsen (1991) to be ‘the most useful verb in scientific English, predominating in almost every type of writing situation except those explicitly set in the past or in the future’ (p.532). This section seeks to discuss the different functions performed by the present tense as is used in the three moves of the IEEE introduction of AP7. Similarly, the use of the present tense in all the 3 moves of LA 3 that the present tense will be examined.

(i) Functions of the Present Tense in Move 1

Referring to AP 7 (Appendix 2), several conclusions can be drawn; firstly, the present tense is used to establish centrality of the subject of investigation by attributing to its role as in lines 1 to 3:

*It is well-known that ray bending due to atmospheric inhomogeneities and diffraction due to terrain obstacles play a dominant role in the design of radar or communication systems for frequencies in the very high frequency (VHF) range and above [1].*
Secondly, it is used to indicate the author’s stance towards cited work (Swales, 1990, p.154) as in:


(b) In her PE model over terrain, Barrios employs the Beilis-Tappert transformation [10] which creates a family of co-ordinate lines that are vertical translations of the terrain profile. (Lines 31-33).

As in (a), the present tense verbs are found in 2 main clauses joined by a connector ‘while’; this appears to indicate that there are no further developments at the present. On the other hand, the present tense in (b) is found in both the main clauses as well as the relative clauses, indicating further development of theoretical possibilities.

In Move 1 of LA 3, for instance, all the 3 steps can be easily conveyed because it is such a versatile tense. Firstly, the present tense is used to establish centrality by claiming increase in demand as in line 5:

Thus there is a growing demand for a power system with high reliability.
Secondly, it indicates the applicability of an approach to the present research as in 'uses' not 'used' in line 23:

This technique uses a quality of service criterion rather than the simple continuity of service criterion and the inadequacy of generation to meet full demand.

Thirdly, the present tense establishes gaps consecutively in showing up the consequences of the gap as in lines 3 to 5:

The size of a modern power system is enormous and the consequences of a major fault in such a system is usually high losses in revenue and property damages.

(ii) Functions of the Present Tense in Move 2

The use of the simple present tense in main clauses may be said, according to Quirk (1973), 'to represent a marked future aspect of unusual certainty, in that, it attributes to the future something of the positiveness one normally associates with present and past events' (p.49). On the other hand, the simple present is regularly used in subordinate clauses that are 'conditional'. In other words, the most important information is contained in the main clauses while the less important information, in the relative clauses, as Swales put it (1986: p. 90). A simultaneous use of the present tense in both
the main and the subordinate clauses is illustrated in the analysis of 3 sentences taken from AP7 (Appendix 2).

Table 4.17
Functions of the Present Tense in the Main and Subordinate Clauses in Move 2 of AP7

<table>
<thead>
<tr>
<th>Use of Present Tense in Main Clause in conveying most important information</th>
<th>Use of Present Tense in Subordinate Clause in conveying less important information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This is especially true in situations</td>
<td>where path loss is desired over ranges extending up to a four hundred kilometers and for receiver heights extending up to a few hundred meters (Lines 7-9).</td>
</tr>
<tr>
<td>2...one is concerned with gross variations of the signal strength over scales of length</td>
<td>that are much larger compared to the wavelength (Lines 13-15).</td>
</tr>
<tr>
<td>3....the results obtained via PE method prove useful</td>
<td>even where back scattering is important (Lines 16-17).</td>
</tr>
</tbody>
</table>

The use of the present tense in Move 2 of the LA 3, however, is mainly that of defining concepts in the active mode as in the following line 1:

*The supply of electrical energy is the main function of an electric power utility.*

and in the passive mode as in the following line 8:

*Reliability evaluation of a composite generation and transmission system is concerned with the problem of determining the adequacy of the combined generation and transmission system in regard to providing a dependable and suitable supply at bulk load.*
(iii) Functions of the Present Tense in Move 3

There appears to be 3 distinct uses of the present tense in Move 3 of the IEEE introductions; firstly, it is used to reassure the reader by initiating a known point of reference. For example, the present transformation is compared and contrasted with a similar process, the Beilis-Tappert transformation as in lines 46 to 49 of AP 7:

*Like the Beilis-Tappert transformation, the presence of sloping terrain produces a correction term in the modified refractive index. However, unlike the former case, the terrain generated correction has a gradient that gradually diminishes with height and vanishes at the upper height.*

Secondly, the present tense is also used to state a possible outcome of the situation as in lines 49 to 51 of AP 7:

*As a consequence, the present transformation relaxes the sampling requirements over steep terrain while maintaining all of the niceties of the Beilis-Tappert transformation.*
Thirdly, the present tense is used to explain the main steps of a process in a sequential manner as in 'we solve' (line 39), 'are assumed' (line 42), 'is constructed' (lines 43-44) and 'we present' (line 51) of AP 7.

In Move 3 of the LA 3, the active form of the present tense is used to state the purpose as in lines 36 to 39:

Thus the aim of the paper is to demonstrate the use of the fast second order Newton-Raphson (SONR) loadflow method\textsuperscript{10} in the security analysis as well as for generation rescheduling and/or load shedding following a contingency.

while its passive form is used to report on a procedure that has already been carried out as in lines 39 to 40 of LA 3:

Reliability indices are then obtained after the corresponding loss-of-load and failure rates and duration have been calculated.

and also to convey the results as in lines 40 to 41 of LA 3:

The results are shown to be useful for the judicious planning of modern electric power systems.
(2) The Present Perfect Tense and Functions

It is interesting to note that the present perfect tense can only be found simultaneously in two moves, Move 1 and 3 of the IEEE introductions. To illustrate the different functions of the use of this tense when used in the different moves, the introduction, BE 7 (Appendix 3) has been analyzed, Firstly, it is used basically in Move 1 to establish a link between the past and the present as in lines 3 to 5.

*Past approaches have relied on apparatuses using electrical or hydraulic actuators that constrain natural human joint movements and limit the results under these conditions.*

In the example shown above, the use of the present perfect tense indicates that even though this reliance on apparatuses has taken place in the past, it is still in effect and the present research is expected to bring something new into effect. Further, the use of the present tense not only reports on a past action which is the application of a method but also implies that this method is currently being actively applied by the researcher as in lines 11 to 13:

*More recently, a static nonlinear, time-invariant method has been applied to identify the contributions to the total joint mechanical properties of the reflex versus intrinsic components [15] by using random position perturbations with a hydraulic apparatus.*
Additionally, the use of the present perfect tense in Move 3 realizes the expectation carried in Move 1 as in lines 16 to 18:

*To overcome the motion limitations of past apparatuses, we have developed non-restrictive one-dimensional (1-D) and two-dimensional (2-D) air-jet systems capable of applying random force perturbations to the human joints without any mechanical constraints [18], [21].*

In the quoted lines is indicated that there is a halt of the past practices with the introduction of airjet systems. It can thus be seen from the preceding discussion that the present perfect tense may be used in Moves 1 and 3 at any time but is seldom used in Move 2 which is mainly concerned with the description of a solution assumption.

The use of the present perfect tense in all the 3 moves in LA 17 (Appendix 7) demonstrates a common function: that of illustrating an action that has happened in the past and is still continuing into the present moment; for example, in Move 1 of LA 7, in lines 15 to 16:

*Some of the models that have been extensively studied are: [4], [5]*

1. McCulloh and Pitts Model 2 Cohen Grossberg model ...

the reference to the models 'have been studied' carries the implication that they are still being studied.
Similarly in Move 2 of LA 7, in the following lines 2 to 4:

*Several biological models of the human nervous system have been studied by biologists in order to obtain an insight in the workings of the human brain.*

the reference to the biological models that 'have been studied' carries the implication that they are still being studied.

In Move 3 of LA 7, in the following lines 21 to 22:

*... and the studies have demonstrated an ability to control a large class of linear and non-linear dynamic systems.*

the reference to the studies that 'have demonstrated' carries the implication that they still demonstrate the ability. Thus, the present perfect tense indicates an action anchored in the past but with a link to the present in all the three actions in the past.

(3) The Past Tense and Functions

In analyzing the functions of the past tense in relation to its occurrence in the moves of the IEEE introductions, the introduction of PS8 (Appendix 4) has been utilized. This tense is used to refer to 'quantitative results of past
literature that are non-supportive of some aspects of the work described in articles' (Oster, 1981) (cited by Swales, 1981, p. 50) as in lines 54 to 55:

Moreover, the number of experts in the power system companies has decreased rapidly, which was observed in [Cigne, 95].

In addition, the past tense may be used to convey a non-committal sense as to whether any further happenings have taken place after this point of time as in lines 55-57:

This happened mainly due to the retirement of a great number of experts in the electrical companies and because a reorganization process of the electrical sector is taking place.

Finally, the past tense is used to indicate the reporting of a main step in a process as in lines 67 to 69.

Thus an expert system, which allows the emulation of the planner’s intelligent behaviour, but can represent all knowledge associated with this problem in an appropriate way, was developed.

Thus, it can be seen that as in the case of the present perfect tense, the past tense is rarely ever used in all three moves simultaneously; it is usually used in Move 1 and maybe Move 3 at the most.
In Move 2 of LA 17, the past tense is used to suggest the non-applicability of the models to the present research as in lines 12 to 13:

*In order to understand the lower cognitive functions of the brain, various models were formulated and proposed. The best known models were those of Hodgkin and Huxley [3].*

In Move 3, the past tense is used in the reporting of a procedure carried out in the past as in the following line of LA 10:

*Feasibility study for Kuantan-Kota Kinabalu cable system in Malaysia was carried out, service demand was calculated taking into account the economic lifetime for 25 years of the new submarine cable system, along with the growth rate of gross domestic product.*

4.12 Use of Predominant Modals- Can and May

It is important to point out that, according to Huckin and Olsen (1991. p. 542), modal auxiliary verbs make careful, precise statements when used appropriately. Only 2 modals, ‘can’, as used in PS8 (Appendix 4), and ‘may’, used in BE5 will be discussed since the rest of the modals used are of relatively minimal significance in terms of their frequency of use. To illustrate
the function of the predominant modals in the 3 moves, the use of 'can' as in LA 13 and LA 2 and the use of 'may' in LA 13 and LA 18 will be analysed.

(i) The Modal 'Can' and Functions

To be demonstrated in introduction PS8, 'can' is the most frequently used modal that is found in all the three moves of the IEEE introductions. However, it is also said to carry slight differences in nuances in meaning in its use in each of the moves. This section will consider the different functions performed by the modal 'can', as it is used in each of the moves in the introduction, PS8. Firstly, in Move 1, it is used as a modal of probability in the review of literature where the findings of previous investigation are being described as in lines 32 to 34:

In this case, the investment and operation problems can be solved together [Garver, 85; Junior, 89; Seifu, 89] or using decomposition principles [Beglari; 75; Pereira; 55; Levi; 91; Romero, 94].

Secondly, in Move 2, it is used to express theoretical possibility in the assumption of a solution as in lines 18 to 20:

On the other hand, the transmission expansion planning can also be executed in a static way, where the planning is performed for the horizon year, determining the reinforcement only for this specific year.
Thirdly, in Move 3, it is also used with statements describing procedural correctness as in:

(a) So, this paper describes an approach for creating a co-operative expert system for planning, where the expert system performs some tasks from the planner and at the same time, the planner can interfere in the planning process. (lines 61-63)

(b) Thus an expert system which allows not only the emulation of the planner’s intelligent behaviour, but can represent all knowledge associated with this problem in an appropriate way was developed. (line 67-69).

In the case of the LA introductions, this modal 'can' is used simultaneously in Moves 1 and 2. In Move 1, it indicates a lack of capability as in lines 25 to 26 of LA 13 (Appendix 6):

*It is understood that the multilayered neural network cannot learn a specific function if there is insufficient number of hidden neurons.*

On the other hand, in Move 2, the modal, 'can' is frequently used to denote a theoretical possibility in making assumptions on the solution as in lines 4 to 7 of LA 13:
For this direct inverse control scheme the neural network can be trained off-line using the general learning architecture of Psaltis et al., (1988) to learn the inverse model of the plant ... Once trained the neural network can be configured directly to control the plant ...

and in lines 14 to 16 of LA 13 as in:

... at the input of the neural network, the correct control signal $\mu$ to the plant can be generated by the neural network controller and so the desired output can be obtained at the output of the plant.

In Move 3, the modal, 'can', is used to express a theoretical possibility as in LA 2 in the following line:

Based on this procedure the local power distribution network can be revised and improvements be made to improve the system's performance.

(ii) The Modal 'May' and Functions

To examine the different functions of the modal 'may' as used in different IEEE introduction moves, the introduction of BE5 is utilized. It is
found that in contrast to the modal 'can', this modal is used to indicate factual possibility in Move 1 as in:

*Thus, small changes in stimulus strength can procedure large shifts in motor-unit recruitment. Such shifts may occur even without changing the stimulus strength of the epineural electrodes more slightly with respect to the underlying axons in the nerve bundle. In such muscles, different parts of the muscle may be recruited non-uniformly.* (line 9) and in Move 3 as in:

*Thresholds to activate muscle fibres directly are higher than those to activate nerve; however it may be possible for some muscle fibres next to the microstimulator to be stimulated directly.* (line 27)

In Move 1 of the LA introductions, the modal 'may' is used to suggest a factual possibility as in lines 35 to 37 of LA 13:

*However, in the case of neuro-control the neural network is trained to learn the relationship of the patterns, therefore, using a large number of training patterns may cause overfitting of the function to be learned.*
In Move 2 of the LA introductions, it is used to indicate a factual possibility as in the following line of LA 18:

*The PLA (Programmable logic arrays) testing methodology used may fall in one of 5 categories viz special coding, signature analysis, parity checking, divide and conquer and a combination of some, or all, of the above, to produce fully testable PLAs.*

It should be pointed out that the modal 'may' cannot be found in Move 3 of the local article introductions.

4.13 Use of the Active and Passive Voices

Despite the rather orthodox view of technical writers in maintaining 'proper' scientific detachment through the use of the passive voice, this section seeks to examine the purpose for which the active and passive modes of expression have been used. Hence, the following table showing the most commonly used tenses and modals in the I.E.E.E. introductions has been derived from Appendices 8 to 11 and tabulated as in:
### Table 4.18
Forms and Nature of Tense and Modal Predominance in I.E.E.E Introductions

<table>
<thead>
<tr>
<th>Predominance of Tenses/Modals</th>
<th>In Active Mode</th>
<th>In Passive Mode</th>
<th>Weak Predominance</th>
<th>Strong Predominance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Perfect Tense</td>
<td>-</td>
<td>Moves 1, 2, &amp; 3</td>
<td>Moves 2 &amp; 3</td>
<td>Move 1</td>
</tr>
<tr>
<td>Past Tense</td>
<td>-</td>
<td>Moves 1, 2, &amp; 3</td>
<td>Moves 1, 2 &amp; 3</td>
<td>-</td>
</tr>
<tr>
<td>Can</td>
<td>-</td>
<td>Moves 1, 2, &amp; 3</td>
<td>-</td>
<td>Moves 1, 2 &amp; 3</td>
</tr>
<tr>
<td>May</td>
<td>Moves 1, 2, &amp; 3</td>
<td>-</td>
<td>Moves 1, 2 &amp; 3</td>
<td>-</td>
</tr>
</tbody>
</table>

As is indicated above, a deliberate and delicate balance has been struck in the use of the two modes of the tenses found. It is clear that there is a strong predominance of the present tense in the active form of which is found to be balanced by a weak predominance of both the present perfect and the past tenses in the passive form. This pattern is repeated in the use of the modals where a strong predominance of the passive form of ‘can’ on one hand, is counterpoised by a weak predominance in the active use of ‘may’ on the other. This peculiar linguistic behaviour contributes towards ‘a natural, comfortable mixture of personal and impersonal constructions, using active verbs as the main mode of expression and interweaving passive verbs skillfully
to change the balance and emphasis’ (Kirkman, 1982, p.50) of what is being written.

<table>
<thead>
<tr>
<th>Tense/Modal</th>
<th>Predominance of Active Voice</th>
<th>Predominance of Passive Voice in</th>
<th>Weak Predominance</th>
<th>Strong Predominance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Tense</td>
<td>Moves 1, 2, 3.</td>
<td>-</td>
<td>Move 3</td>
<td>Moves 1 &amp; 2</td>
</tr>
<tr>
<td>Present Perfect Tense</td>
<td>Move 1</td>
<td>Move 2</td>
<td>-</td>
<td>Move 1</td>
</tr>
<tr>
<td>Past Tense</td>
<td>Move 1</td>
<td>Move 3</td>
<td>-</td>
<td>Moves 1 &amp; 2</td>
</tr>
<tr>
<td>Can</td>
<td>Move 1</td>
<td>Moves 2 &amp; 3</td>
<td>-</td>
<td>Move 2</td>
</tr>
<tr>
<td>May</td>
<td>Move 1</td>
<td>Move 2</td>
<td>-</td>
<td>Move 1</td>
</tr>
</tbody>
</table>

In the case of the LA introductions, the linguistic balance between the 2 modes of expression is achieved in that there is a predominance of the active form of the present perfect and the past tenses in Move 1 while the passive form of the same tenses and modals predominates in Moves 2 or 3 in both moves. It is also noted that the predominance of a tense or modal in these moves is of varying intensity. It is further noted that although all the 3 moves are predominantly in the active form of the present tense, the predominance is of varying intensity.