

**ORGANISATIONAL POLITICS AND INFORMATION SYSTEMS  
IMPLEMENTATION: THE CASE OF THE INDIAN PUBLIC ADMINISTRATION**

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*This thesis is dedicated to my wife Bama.*



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## **Abstract**

Today, many developing countries are embarking on ambitious programmes to develop large computer-based information systems within their public administration to promote socio-economic development. However, the overall objectives of these investments remain unfulfilled. Success and failures of information systems are largely determined by the performance of organizational members associated with the development and use of information systems. Performance of these members is primarily determined by individual competencies and the environment in which the activities of these members are taking place. Information systems related education and training to create competent individuals has always been a matter of great concern to almost all developing countries. However, public administration in developing countries is an intensely political affair. Organizational politics very often give birth to a number of macro and micro environmental conditions, which constrain certain courses of action of competent individuals. Therefore, individuals, however competent, cannot perform to the best of their abilities. This invariably results in information systems that are ineffective and inefficient. Systematic empirical studies that can increase our understanding of this domain are virtually non-existent. The current research aims to rectify this issue. The research methodology adopted for the current research assumes that organizational members, when involved in a particular activity in a particular context, interpret the situation, and act accordingly. Researchers, by immersing themselves in the members' world can understand their actions. Focusing on two cases within the public administration of India and adopting a hermeneutic approach, the study interprets the actions of different organizational members associated with the implementation of information systems. By relating the performance of these members to the strengths and weaknesses of the information systems, the study makes broad recommendations. Findings of the study reveal that Indian policy makers and implementers have always given significant consideration to information systems related education and training. However, on the other hand, the very factors that India has been trying to address through successive administrative reforms since national independence happen to be the same factors that constrain the performance of competent individuals.

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# CHAPTER ONE

## Introduction

### 1.1. Research background

Information technologies are one of the most significant scientific-technological developments of the past four decades (Masuda, 1985; Zmud, 1991; Sutz, 1992). Many writers have claimed that effective use of information technologies is the key to business success in the increasingly competitive global economies of the millennium (Sabel and Piore, 1984; Zuboff, 1988; Kanungo, 1995). With the rapid technological advances in information technologies, the influence of computer-based information systems, generally referred to as information systems (IS) is also expanding (Masuda, 1985; Laudon and Laudon, 1991; Venkatraman, 1994). Information systems incorporate information technology, people, and organisations (Land, 1992; Walsham, 1993). The capabilities of information systems to *automate* organisational procedures and *informate* different levels of management have prompted many organisations in the advanced industrialised countries to *transformate* their businesses (Zuboff, 1988; Venkatraman, 1994; Kanungo, 1995). Today, in the industrialised countries, investments in computer-based information systems are absorbing a greater percentage of organisational resources. Their applications are assuming an increasing centrality in the operational and strategic areas of organisational activity (Turban, 1991; Kroenke, 1992; Davidson, 1993).

The combination of the capabilities of computer-based information systems and the prevailing needs of many developing countries has prompted many national and international organizations to canvass the vigorous application of information systems to administrative and managerial processes (UN Report, 1985; Neelameghan & Tocatlian, 1985; Dosa, 1985; Bhatnagar, 1992). Application areas proposed, both potential and actual, include diverse fields such as financial planning and management; disaster and crisis management; agriculture; transportation planning; water resource management; utilities; primary health care management; education; banking; trade, rural and urban development; and so on (Kohli, 1986; Schware and Choudhry, 1988; Bhatnagar, 1995). The potential benefits of applying information systems to such diverse fields include

production of internally consistent information and access to such information, good governance, efficient use of scarce resources, industrial competitiveness, increased wealth and employment through efficient economic administration and increased productivity, improved product quality, increased accuracy and reliability of systems in place now, and so on (Smithson and Land, 1986; Kohli, 1986; Schware and Choudhury, 1988; Bhatnagar, 1992; 1995). In fact, it can be suggested in this context that one is hard pressed today to discover an area of national development which could not, potentially at least, benefit from the introduction of computer-based information systems.

The point to be noted in this context is that in many developing countries, it is their public administration that plays a critical role in the process of socio-economic development, nation building, policy formulation, and policy implementation (Dubhashi, 1986; Mehta, 1989; Dwivedi, 1990). Some of its features are its compulsory character, its particular relation to the law and the accountability of its operations (Beetham, 1987). Private organisations are excluded on the grounds that there are distinct aspects to public administration because of its location in the state. Consequently, the success and failures of various programmes of socio-economic development in these countries come to depend largely on the capabilities of their public administration (Heady, 1984; Baark, 1986). However, public administrations in many developing countries were originally designed by colonial powers to perform regulatory functions in dependent countries. After national independence, with some modifications, they are being utilised for the task of nation building (Heady, 1979; Maheshwari, 1989; Dwivedi, 1990). Today, their role and function in the altered circumstances, that is, developmental functions in independent countries as opposed to regulatory functions in dependent countries, has generated a number of controversies. Prominent amongst these is the argument that public administrations often perform poorly, which in fact is caused by a common set of internal and external environmental factors (Maheshwari, 1989; Turner and Hulme, 1997). For example, bureaucracy, within the public administration of developing countries evokes the slowness, the ponderousness, the routine, the complication of procedures, and the maladapted responses to the needs which they should satisfy (Crozier, 1994).

Unusual delays are caused by all kinds of checks, controls, and blocks like audit, parliament and constitutional provisions including administrative laws, regulations and so on (Banerjee, 1985, Mehta, 1989).

Today, many developing countries are making significant investments in ambitious programmes to develop large computer-based information systems within their public administration (Shio, 1981; Dubhashi, 1986; Baark, 1986; Mehta, 1989; Dwivedi, 1990; Hanna, 1994; Madon, 1994). Overall, the aim of such investments are claimed to improve the performance of the public administration by improved access to information, thereby producing more informed, better-reasoned decisions (Baark, 1985; Hanna, 1994). However, in practice, the situation concerning information systems in development administration is far from encouraging. The literature points to a number of obstacles and extravagant failures rather than success stories (Shio, 1981; Neelameghan and Tocatlian, 1985; Avgerou, 1990; Peterson, 1990; Walsham et al., 1990; Peterson, 1991; Madon, 1994; Walsham and Sahay, 1996). The point to be noted in this context is that the majority of factors that cause these obstacles and failures are in fact related to individuals, groups, and organisations.

The main theme emerging from this discussion is a reminder that the design, development, and application of information systems are heavily influenced by the goals, values, and beliefs of individuals, groups and organisations, and that the social and organisational context in which the technology is embedded is as important as, often even more than, the technology itself (Walsham, 1990; Land, 1990; Hirschheim, 1995).

The task of implementing information systems is very complex and demanding. It requires that a number of individuals and groups perform a wide range of activities during different stages of systems implementation (Zmud, 1983; Lucas, 1990; Avgerou & Cornford, 1993). Consequently, the performance of those who produce and deliver information systems, and those who apply and use information systems becomes an important factor in determining the success and failure of information systems (Lucas, 1990). Performance of these members on the other hand, is largely determined by individual and group competencies and the environment in which the activities of these members are taking place (Megginson, 1981; Nelson and Cheney, 1987; Crabtree et al., 1992; Addison, 1992). Individuals and group

competencies, in this context, refer to information systems related knowledge/skills of individuals or a group to accomplish an objective in relation to IS implementation (Collis, 1994; Marino, 1996). The environment on the other hand, refers to the overall organisational context in which the activities of individuals take place (Knights and Murray, 1994).

An organisation's most valuable resources are its staff. Without them, there would be no organisation. Individuals and groups design, develop, and use information systems. To carry out these activities, respective members will need to have gained appropriate information systems related knowledge/skills. This is acquired through IS related education/training (Nelson, 1991). To this end, information systems related education/training has always been a matter of great concern to almost all developing countries. Given the common assumption that providing a variety of information systems related education/training to organisational members is the key to successful application of information systems, almost all developing countries have taken a number of initiatives to address the issues related to IS education/training (Seshagiri, 1987; Suwandi & Chong, 1989; Rab, 1989; Rahman, 1991). In fact, this is one of the few areas of agreement, both at the national and international level (Bogod, 1979; Paker, 1981; Kalman, 1981; Broadman, 1986; Odedra, 1990).

However, it should be noted that it is the same computer science curriculum transported from the advanced industrialised countries that takes different names and forms without many changes in underlying concepts (Bhatnagar, 1992; Odedra, 1992). Consequently, the appropriateness of the scope and contents of these programmes has always remained a controversial issue. The majority of information systems related education/training programmes in many developing countries overemphasise on the theoretical and/or practical issues of computer science or they concentrate on keystroke level of training for using application packages. In fact, they impart knowledge/skills in the area of information technology rather than the application of information technology in organisations, which is totally a different subject.

On the other hand, providing information systems related knowledge/skills to organisational members associated with the application of information systems does not guarantee any improved performance on their part because individuals, however competent, are limited by

the environment in terms of their performance. Given that organisations consist of individuals assembled to achieve a common goal, and that organisations have their own environment, micro (organisational) and macro (wider) environmental factors become critical in determining the performance of competent individuals within organisations (Walsham, 1993; Knights and Murray, 1994). In fact, competent individuals cannot be bracketed off from the political, social, and cultural backgrounds of organisations (Enos, 1991; Walsham, 1993; Knights and Murray, 1994; Grant, 1996). To this end, a number of researchers from the IS community have viewed the IS development environment, that is, organisations, from its different dimensions. They have viewed organisations as machines, as organisms and as cultures, and subsequently described how different features of the environment influence the performance of organisational members (Mumford and Hanshall, 1979; Kling, 1987; Zuboff, 1988; Walsham, 1993).

The point to be noted in this context is that not many writers like to examine the politics related to IS implementation in an explicit manner. Usually, a huge effort is made to give organisations the appearance that they really run to clear formal procedures in pursuit of goals that are rationally derived from their objective operating conditions. Politics within organisations is identified as a deviant, informal and irrational activity that disrupts the smooth running of organisations and the efficient achievement of their goals (Walsham, 1993; Knights and Murray, 1994). Although a significant number of authors have reflected considerable interest in power and politics, the literature in this area can be argued to be not extensive (Kling and Scaachi, 1980; Keen 1981; Mark, 1983; Kling and Iacono, 1984). Consequently, the prescriptive literature, aimed at practising managers or information systems professionals, frequently makes little or no mention of political and power elements.

The political metaphor, suggested by Morgan (1988) encourages us to see organisations as loose networks of people with divergent interests who gather together for the sake of expediency (Walsham, 1993). Given that information systems are social systems, power, and politics become the most important and prominent factors in determining the activities of organisational members associated with the application of information systems. According to Knights and Murray (1994), organisational life is about politics. It is not an exception or an optional extra. Politics is a constant abiding presence at the heart of organisational life.

Individuals and collectives struggle to achieve and reproduce a sense of material and symbolic security in the world. Within management, this struggle centers on the individual pursuit of career and the symbolic and material achievements of success. All these struggles also lead to complex alliances of managers within and between particular functions and departments.

Organisational politics (OP) is about the pursuit of self-interest or the pursuit of functional managerial interests in opposition to organisational goals. OP is the process that stands at the centre of events and practices in contemporary organisations. OP gives rise to specific *conditions of possibility*, that is, conditions that make certain courses of action feasible while constraining or ruling out others. These concern both micro (organisational) and macro (wider) conditions of possibility. The point to note here is that the process of organisational politics is central to the development and deployment of information systems. In fact, the intensity of IT-related politics has increased with the growing complexity of IT management and systems development issues. What is important is that political struggle is inescapable and cannot therefore be excluded in accounting for the development of information systems.

Public administrations in developing countries operate under distinctive and diverse socio-political and socio-economic realities (Kluzer, 1993; Madon, 1994; Turner and Hulme, 1997). They are often different from those realities encountered by their counterparts in the advanced industrialised countries. The point to note in this context is that, in many developing countries, the public administration operates as a sub-system of the political system in which it operates. Therefore, it has more interactions with the political system than with the socio-economic or socio-cultural system (Chowdhury, 1990; Turner and Hulme, 1997). Consequently, development administration can be argued to be an intensely political affair. This naturally leads to an increase in the intensity of politics and institutionalisation of political process within the public administration (Knights and Murray, 1994). As such, the context specific micro and macro environmental conditions created by organisational politics play a critical role in determining the performance of competent individuals associated with the application of information systems within the public administration of developing countries. Lack of IS related knowledge/skill may not simply a matter of supply failing to keep pace with demand. In fact, political responsiveness has often been maintained against

professional competence (Turner and Hulme, 1997). Qualified personnel may exist but this does not necessarily mean that they will perform to the best of their abilities. In fact, the intensity of this process is arguably at its peak within development administration (Enos, 1991; Knights and Murray, 1994; Grant, 1996).

## **1.2. Aim of the research**

Under the circumstances described in the previous section, effective application of information systems within the public administration of developing countries to accelerate socio-economic development begs the question: **To what extent does organizational politics constrain the performance of competent individuals?** Research in this domain is virtually non-existent. Therefore, increasing our understanding of this domain involves addressing the following questions:

- Why information systems are developed within the development administration?
- How are they developed at present?
- Who are the organisational members associated with the application of information systems within the development administration?
- Why do they participate in systems development?
- To what extent does their performance affect the effectiveness of the final system?
- What information systems related knowledge/skills do they possess at present?
- To what extent do they use their knowledge/skills in the present environment?
- What are that factors that constrain their performance, both within and outside the organisation?
- What can be done to improve the situation?

Answers to these questions are of immense value to a variety of people concerned with the application of information systems for development administration, such as researchers, practitioners, policy-makers, and international aid agencies. The current research increases our understanding of this domain through empirical work. For example, it points to the limitations of the common assumption that providing organisational members with a variety of IS related education/training is the key to successful application of information systems in

developing countries. It also describes how performance of competent individuals is constrained by the intensity of politics and institutionalisation of political processes. Finally, the study provides broad guidelines for positive changes for the future.

It should be noted in this context that although the task of implementing information systems involves a number of individuals and groups, the current study explicitly addresses issues that are only related to individual competencies. A number reasons can be attributed for this. Firstly, individuals go to make groups. Therefore, there is a need to understand individual competencies first. However, on the other hand, studies that can increase our understanding about individual competencies in the context of developing countries are non-existent. Secondly, trying to understand group competencies and group behaviour under circumstances where there is very little understanding about individual competencies would obviously involve more time. The nature of the current study has time constraints. Thirdly, both case studies concern individuals (primarily) rather than groups. Finally, the hermeneutic research method has a strong focus at the level of the individuals, and individual acts of interpretation.

### **1.3. Structure of the thesis**

The research background, the aim of the research and the structure of the thesis are briefly described in the first chapter. The second chapter reviews and assesses the current body of knowledge in three subject domains related to the research issue: IS implementation and organisations; IS implementation and individual competencies; and IS implementation and development administration. The third chapter deals with the research strategy. It primarily describes how the research problem is approached and an appropriate study methodology is designed. The macro environment of the current study, India, is described from its historical, socio-cultural, political, socio-economic, technological, and educational dimensions in chapter four. The micro environment of the current study, the Indian public administration, is described in terms of its history, structure, culture, people, functions, and technology in chapter five. Chapters six and seven are concerned with case studies. While chapter six describes the introduction of computers to administer a social welfare scheme in the State of Tamil Nadu, chapter



seven describes the introduction of computers to administer the duty exemption scheme at the Office of the DGFT. Chapter eight interprets the actions of organisational members associated with the case studies against the macro and micro environment, and offer directions for positive changes for the future. Chapter nine briefly discusses the strengths and weaknesses of the current study and suggests directions for future research.

## CHAPTER TWO

### Literature Review

The application of computer-based information systems within the public administration of developing countries to accelerate socio-economic development was portrayed to have achieved only a limited amount of success in the previous chapter. It was further suggested that the majority of factors that are responsible for this limited amount of success are in fact related to individuals and organizations. This implies that if a comprehensive solution is required, then significant efforts and purposeful investments are required to improve the performance of organizational members who are associated with the application of information systems within the public administration. In order to achieve this, one of the most fundamental requirements is that organizational members who are associated with the application of information systems within the public administration will need to have gained appropriate information systems related knowledge/skills. Obviously, no performance can take place without competent people. At the same time, the context within which the performance of individuals is taking place is as important as, often even more than, the knowledge/skills of individuals itself. This is because contextual conditions often play a critical role in constraining the performance of competent individuals. Consequently, the design, development, and operation of information systems within the development administration can be argued to be heavily influenced by the environment as well as by the competency of individuals.

The current research aims to address the broad question: *To what extent does organisational politics constrain the performance of competent individuals within the public administration of developing countries?* The overall aim of this chapter is to review and assess the current body of knowledge related to the research question in order to build a conceptual framework within which the current research can be conducted. Therefore, the research domain is broken into three constituent elements: 1) IS implementation and organizations; 2) IS implementation and individual competencies; and 3) Development administration and IS implementation.

## **2.1. IS implementation and organisations**

Information systems are social systems. They are developed and used within the context of a specific organization. Consequently, organizations evolve dispositions towards information systems and information systems evolve dispositions towards organizations (Angell and Smithson, 1991; Walsham, 1993). The point to be noted in this context is that the political, social and cultural backgrounds of organizations often affect the process of information systems development. To this end, research into information systems failure has concluded that the primary cause of failure is the lack of consideration given to the social and behavioral dimensions of information systems (Davis et al., 1992; Galliers et al., 1992; Land, 1992). Consequently, the need for a strong organizational emphasis rather than a technical emphasis has prompted many IS researchers to focus mainly on organizational issues in recent years (Brancheau and Wetherbe, 1987; Kraemer and King, 1990; Walsham, 1993).

There is no universally accepted definition of an organization. Historically, organizational theory developed from two main sources (Lucey, 1991). The classical school with its somewhat mechanistic emphasis on structures, which could be imposed on people, and human relations school with its emphasis on motivation and human relationships in the work place. Modern workers have built upon earlier ideas in an attempt to provide a more comprehensive view of organizations. The widely cited book by Morgan (1986) is based on viewing organizations through eight organizational metaphors – organizations as machines, organisms, brains, cultures, political systems, psychic prisons, flux and transformation, and instruments of domination.

Rationalist and positivist approaches to implementing information systems can be suggested to be taking a mechanistic view of organizations (Kling, 1987). Accordingly, they tend to measure the correlation between organizational performance and information technologies. They seem to assume that information technology is an autonomous change agent. Based on this assumption, it is argued that information systems have the capability to democratize work and make enterprises more effective, flexible and adaptable (Sabel, 1982; Piore and Sabel, 1984; Zuboff, 1988). Furthermore,

it is suggested that information technology will bring about positive changes itself, if only management can let go of its obsession with control. It should be noted that organisational structure, in terms of *information centres* and *decentralisation* received significant attention of a number of authors during the 1980s (Wetherbe and Leitheiser, 1985; Christy and White, 1987; Magal and Carr, 1988). However, on the other hand, many of these ideas have been challenged by a number of authors (Scase and Goffee, 1989; Coombs, 1993; Knights and Murray, 1994). For example, questions have been raised of how managers will be persuaded to let go their authority and control, especially at a time of competition. Furthermore, when building information systems, powerful organizational resources become represented explicitly, which is more likely to reinforce hierarchical power than undermine it. All these issues point to the political dimension of information systems implementation. Unfortunately, such issues have been largely ignored in studies of this nature. In sum, it can be argued that those who approach the task of implementing information systems based on such naïve views are unlikely to be successful in any sense of that term (Walsham, 1993).

Much of the current literature on information systems implementation can be linked to the organismic view of organisations, which has given birth to the socio-technical approaches to implementing information systems (Mumford and Hanshall, 1979; Pfeffer, 1981; Willcocks and Mason 1987). The socio-technical systems approach focuses on the interdependence of the social and technical aspects of work, and aims to achieve an efficient fit between computer systems and what is perceived to be political and cultural organisational contexts. In other words, the positive effects of information technologies within organisations are seen as dependent upon social factors and group behaviour. To this end, the role of management processes, managerial effectiveness, management strategies and management climate plays a significant role in determining the success of information systems within organisations (Strassmann, 1985; 1990; Boynton, et al., 1994; Soh and Markus, 1995). However, there are accusations that the prescriptions arising from the socio-technical approach literature are rather simplistic when one attempts to apply them in specific organisations. At the same time, it is also argued that advocates of the socio-technical approach supply information systems specialists with techniques to promote them as change agents, seeming to believe that these personnel do not have an agenda of their own other than one of implementing successful

systems (Knights and Murray, 1994). The point to be noted in this context is that even socio-technical approaches have largely ignored any serious examination of power and politics in the process of technological change (Walsham, 1993; Knights and Murray, 1994).

The cultural metaphor of organisations in its symbolic form has received very little attention when compared to the machine and organismic metaphors of organisations (Walsham, 1993). Culture is a process of reality construction that allows people to see and understand particular events, actions and utterances in distinctive ways. Within an organisation, the enactment of meaning is a collective activity and thus cultural structures or structures of shared meaning are created within the organisation. The social process of information systems application in an organisation as being carried out by human actors within social contexts which are constituted by social actions has been discussed by a number of authors (Boland, 1979, 1985; Markus and Pfeffer, 1983; Robey and Markus, 1984; Lyytinen, 1985, 1987; Hirschheim and Newman, 1991; Walsham, 1993; Han and Walsham, 1993; Mata, et al., 1995). These authors suggest that unless design and implementation efforts address the structural features of organisations, involving power distributions and cultures, they will not be successful, even if they employ process strategies such as participative design. Some cultural aspects of an organisation, which determine the success of computer based information systems are presented by Land, Le Quesne and Wijegunaratne (1989). To this end, the study by Willcocks and Mark (1989) suggests that, if general management is to operate successfully and bring in information systems to serve its purposes, it must establish political and cultural support for its objectives and their implementation, through identifying and responding to other group and individual objectives in the organisation.

### **Organizations as political systems**

The political metaphor encourages us to see organizations as loose networks of people with divergent interests who gather together for the sake of expediency (Walsham, 1993). With respect to the literature on computer-based information systems, the widely cited study by Pettigrew (1973) established the notion of organization as a political system and the politics of career and self-advancement as a major dynamic in organizational reproduction and change. Following this study, an important strand of IS

research emerged in the 1980s. According to Knights and Murray (1994), these studies were prompted primarily by two factors. Firstly, the publication of important texts by Pfeffer (1981) and Mintzberg (1983) on organizational power, which questioned rationalist views of organizations; and secondly, the increasing emphasis on user involvement in systems design.

These studies began to explore the place of politics in systems development practices (Franz and Robey, 1984; Klein and Hirschheim, 1987; Wilcocks and Mason, 1987). At the same time, a number of authors during this period have pointed out the need to give attention to power and politics, and the subsequent need to understand the political structure of an organization in deciding the success of information systems within that particular organization (Kling and Scaachi, 1980; Keen, 1981; Markus, 1983; Markus and Bjorn-Anderson, 1987; Mark, 1989). For example, the article by Keen (1981) viewed information systems application as *an intensely political* process. Markus and Pfeffer (1983) suggest that if the goal of implementers is to minimize resistance and maximize system success, then systems should be designed to be consonant with organizational *power distributions and cultures*. Kling and Iacono (1984) note that political campaigns can continue throughout the life of a computer-based information system and that key actors can build support for a system by a variety of means and manipulate structural arrangements for favorable actions. In addition, important actors can go about in *quieting opposition*, using a variety of tactical opposition. The use of power by information systems professionals during systems development process was discussed by Lucas (1984), and Scarborough and Corbett (1992). On the other hand, a number of authors regard the deployment of information technology within organisations as a conscious plan to gain control of workers by de-skilling work tasks and intensifying the monitoring of manual labour processes (Braverman, 1974; Child, 1985; Hyman, 1987).

Overall, the literature on this domain advocated a general IS awareness of power and politics, and aimed to bring these issues to the awareness of systems analyst. At the same time, a general view in this literature is that politics is pursued for purposes of securing control over often undefined personal interests (Knights and Murray, 1994).

However, on the other hand, it can be argued that when one considers the undoubted importance of political actions within organizations in relation to information systems, the literature in this area is not extensive. Though a number of writers point to numerous common problems such as conflicts of interest, top management support, and so on, nobody seems to examine the fragile and precarious character of politics in an explicit manner (Lyytinen and Hirschheim, 1987; Baier, March and Saetren, 1988). Instead, a huge effort is made to give organizations the appearance that they really run to clear formal procedures in pursuit of goals that are rationally derived from their objective operating conditions. Politics in its symbolic sense is treated as somehow aberrant, deviant, and perhaps even subversive (Pettigrew, 1971; Pfeffer, 1981). Furthermore, the prescriptive literature aimed at important actors makes little or no mention of politics in an explicit manner. For example, when one examines the seven generations of information systems development methodologies, none of the methodologies seem to give explicit attention to politics (Table 2.1) (Hirschheim, 1995). Overall, writers tend to shy away from politics for two reasons (Walsham, 1993). Firstly, the process of the exercise of power and the taking of political action is highly complex; and secondly, the myth of rationality in contemporary business organizations constrains explicit acknowledgement of politics.

Generation	Methodology
0	Pre-methodology era
1	Formal Life-Cycle Approaches
2	Structured Approaches
3	Prototyping and Evolutionary Approaches
4	Socio-Technical – Participatory Approaches
5	Sense-Making and Problem Formulation Approaches
6	Trade-Union Led Approaches
7	Emancipatory Approaches

**Table 2.1. Seven generations of ISD methodologies (Hirschheim et al., 1995)**

Perhaps the fullest and most meticulous application of the political metaphor to the area of information systems development has occurred in the recent work of Knights and Murray (1994). The authors argue that organizational life is about politics. That is, politics is not an exception or optional extra. It is a constant abiding presence at the

heart of organizational life. Individuals and collectives struggle to achieve and reproduce a sense of material and symbolic security in the world. Within management, this struggle centers on the individual pursuit of career and the symbolic and material achievements of success. For example, when career competitions get complicated, successful managers develop an acute sense for creating an image of themselves as successful on a day-to-day basis. This includes treating superiors in a particular way, in putting on displays of competence for selected audiences, and massaging and manipulating the reality reaching superiors in such a way that it conveys a message of controlled competence, efficiency and innovation. It also involves complex alliances of managers within and between particular functions and departments (Mills, 1956; Dalton, 1959; Burns and Stalker, 1961; Jackal, 1988). The political process of organisational life, then, is fundamental to the striving of managers to create a sense of themselves that is coherent, manageable and convincing to significant others both inside and outside the organisation.

To this end, organisational politics (OP) is about the pursuit of self-interest or the pursuit of functional managerial interests in opposition to organisational goals (Drory and Romm, 1990; Knights and Murray, 1994). OP has three important dimensions. These are the intensity of political processes, the degree of institutionalisation of that process, and actors' awareness of political process as a self-conscious activity. It is argued that OP is a process that stands at the centre of events and practices in contemporary organisations. The rules of the OP game prohibit too explicit a display of career goals, and they remain concealed behind the more legitimate pursuit of formally acknowledged organisational goals. However, it is only through OP as an ongoing social process that organisations and their interests and goals are constructed.

The point to be noted here is that the political process is enacted in specific conditions of possibility, that is, conditions that make certain courses of action feasible while constraining or ruling out others. These conditions are constituted by political processes. The conditions concern both local (micro) and general (macro) conditions of possibility (Knights and Murray, 1994). Micro conditions are constituted by:



- **An organisation's structure:** hierarchical forms, division of labour, distribution of resources, development of rules etc.
- **An organisation's practices:** the way in which the organisation operates, how the day-to-day tasks are carried out etc.
- **An organisation's culture:** particular norms, customs etc.
- **Subjectivity:** the way individual organisational members experience and make sense of themselves and their world. In other words, what it is to be a particular category of person from the inside as well as in relation to others.
- **Technological possibilities:** past experiences of technology use, attitudes and understandings of technology, material and symbolic resources controlled by IS professionals, their relations with senior and junior users, vested interests in seeing systems in place and so on.

Macro conditions mean the general conditions within which an organisation operates. These include general socio-economic and socio-political conditions such as inequality of resource distribution and life chances, social structure, legitimating social hierarchies, aggressive use of power, achieving individual and familial security etc. The point to be noted here is that even these macro conditions are constituted by human actors through political processes.

What is important in this context is that the environmental conditions under which individuals labour are not generally of their own choosing. They confront them as a given reality. It is predefined. For example, the idea of a particular sort of management, behaviour, attitudes and norms is established and treated as natural. The manager moving into this context has to come to terms with normalised modes of behaviour (Foucault, 1977). It may be possible to effect small and local changes in management practice, but mere survival will involve the replication of existing practices to a greater or lesser extent.

Having pointed out these issues, Knights and Murray (1994) argue that information technology and systems have then to be examined in the context of these political conditions and consequences of their development and use. It is impossible and

misleading to separate off the pursuit of self or sectoral interests from those of the organisation itself. The political struggle is inescapable and cannot therefore be excluded in accounting for the development of information systems (Burawoy, 1989; Litter, 1982).

## **2.2. IS implementation and individual competencies**

The process of information systems implementation within organizations incorporates a number of tasks. These tasks, taken together, make up a complex and multi-dimensional process, which is difficult to understand and control (Avgerou and Cornford, 1993). At the same time, these tasks require that a number of individuals perform a wide range of activities during different stages of systems development (Zmud, 1983; Lucas, 1990). In order to perform, one of the fundamental requirements is that individuals associated with the application of information systems will need to have gained appropriate information systems related knowledge/skills. To this end, a number of studies were conducted starting from the 1970s to understand information systems related knowledge/skills of organisational members. Overall, these studies point to a number of activities that need to be performed by different individuals during different stages of systems development, and individual competencies required to carry out these activities (Table 2.2) (Lucas, 1990).

Starting from the 1970s, three main forces have caused a fundamental change in the way the knowledge/skill requirements of IS professionals were perceived. They are the changing business environment, the changing role of information systems, and the changing technologies (Lee et al., 1995). In this context, it became increasingly evident to both academia and practice that the specialist knowledge that was needed to understand the technology and to apply that within an organisational context was out of balance with the needs (Keen, 1987). To this end, the results of different studies to understand the knowledge/skills requirements of IS professionals indicate that the requirements of these professionals have been evolving over the years (Miller, 1978; Batrol and Martin, 1982; Baroudi, 1985; Cheney, 1988; Hirschheim and Klein, 1989; Nelson, 1991; Couger et al., 1995). Perhaps the two most recent empirical studies dealing explicitly with the knowledge/skill requirements of information systems professionals were conducted by

Nelson (1991) and Lee et al., (1995). The study by Nelson presents 30 items of required knowledge/skill as perceived by information systems professionals. The findings of the study are presented in Table 2.3 adopting six factors (groupings) of knowledge/skill items suggested by Zmud (1983). The study by Lee et al., (1995) suggests that industry will demand a cadre of information systems professionals with knowledge/skills in technology, business operations, management, and interpersonal skills to effectively lead organisational integration and process re-engineering activities (Table 2.4). The point to note in this context is that an IS professional, when developing information systems within organisations, have four broad roles to play (Hirschheim and Klein, 1989):

- To be the expert in technology, tools and methods of system design, and project management;
- To interact with management to find out what type of system makes sense, but there is no objective criterion that distinguishes between good and bad systems;
- To decide whether to side with management and become their agent, or join the interest of labour; and
- To take the role of social therapist by seeing the systems development process as emancipation through rational discourse.

On the other hand, for more than three decades, the concept of user involvement has been proclaimed as a critical ingredient in the success of information systems development efforts in the industrialised countries (Ives & Blake, 1984; Barki & Hartwick, 1989). The need to provide appropriate knowledge/skills to a wide range of user members have prompted many writers to emphasise the value of education/training, and to call for enhanced programmes for end users (Moran, 1981; Bronsema and Keen, 1983; Rocket and Flannery, 1983; Cotterman and Kumar, 1989). There is a large prescriptive literature on user participation and end user computing that explicitly, and sometimes implicitly, suggests the required abilities of end users (Lucas, 1978; Robey & Farrow, 1982; Zmud, 1983; Franz & Robey, 1986; Panko, 1988; Barki & Hartwick, 1994; Nelson, 1991). For example, Franz and Robey (1986) describe four core abilities of end users: 1) explaining and clarifying information needs; 2) detailing input and output requirements; 3) stating system needs and objectives; and 4) asking questions and providing answers.

STAGES	USERS	MANAGEMENT	IS PROFESSIONALS
Inception	Initiate study, suggest application, sketch information needs, describe existing procedures	Approve area of application, set objectives	Listen to requirements, respond to questions, devise alternatives, prepare preliminary survey
Feasibility study	Help evaluate existing system and select alternative for design	Review feasibility, understand proposal and choose alternative	Evaluate alternatives using agreed-upon criteria
Systems analysis	Help describe existing system, collect and analyse data	Provide resources, attend reviews	Conduct analysis, collect data and document findings
Systems design	Design output, input, processing logic, design manual procedures	Encourage user design, provide rewards, attend reviews, plan impact	Present alternatives and trade-offs to users to their decisions
Specifications	Review specifications, help develop specifications for manual procedures	Understand high-level logic, key features	Combine user's needs with technical requirements to develop specifications
Programming	Monitor progress	Monitor, provide buffer, extra resources	Organise programming, design modules, code programs, report progress
Testing	Generate test data and evaluate results	Review	Test program module individually and in entire system
Training	Develop materials, conduct training sessions	Review	Train operations staff
Conversion	Provide resources	Attend user sessions, demonstrate management commitment	Co-ordinate conversion, aid users
Operations	Utilise output, monitor system use and quality, suggest modifications and enhancements	Monitor	Respond to enhance requests, suggest improvements, monitor service

**Table 2.2. Activities of Organisational Members (Source: Lucas, 1990)**

A hierarchy of skills is described by Panco (1988) that end users need to master on their way toward innovation – changing the very way the person or department works in

response to the capabilities of new technologies. Perhaps Nelson and Cheney (1987) conducted the most relevant work dealing with end-user knowledge/skills to date. The authors have attempted to measure end-user abilities via set of 11 skill (ability) items, which they claim was created from a review of the literature, their personal experience, and discussions with information centre personnel and end-users (Figure 2.1).

<b>I. Organisational knowledge</b>	<b>IV. General IS knowledge</b>
1. Organisational goals 2. Organisational functions 3. Critical success factors 4. Environmental constraints	12. IS policies and plans 13. Fit between IS and organisation 14. Existing IS applications 15. IS/IT potential 16. IS/It for competitive advantage 17. Privacy issues
<b>II. Organisational skills</b>	<b>V. Technical skills</b>
5. Interpersonal communication 6. Interpersonal behaviour 7. Group dynamics 8. Project management	18. Programming 19. Use of software packages 20. Model building 21. Model application 22. Data access 23. Database development 24. Data communication
<b>III. Organisational unit</b>	<b>VI. IS product</b>
9. Work unit objectives 10. Work unit problems 11. Links with other work units	25. Use of application systems 26. Use office automation products 27. Use of operating systems 28. Preparation of documentation 29. Use/understand documentation 30. IS evaluation and maintenance

**Table 2.3. Knowledge/skills items grouped by Construct (Nelson 1991)**

<b>Ability to:</b>	
1. Use Application Development Software	2. Use Packaged Application Software
3. Use Office Automation Software	4. Program
5. Build Models	6. Access Data
7. Handle Data Communications	8. Use Hardware
9. Utilise Graphics Techniques	10. Use Operating System
11. Understand and Interpret output	

**Figure 2.1. IS related knowledge/skills of end-users (Nelson and Cheney, 1987)**

<b>I. Technical specialities knowledge</b>	<b>II. Management skills</b>
<ul style="list-style-type: none"> <li>* Third generation languages</li> <li>* Telecommunications and Networks</li> <li>* Operating Systems: M.Frames, Minis, &amp; Micros</li> <li>* 4th generation languages</li> <li>* Systems integration</li> <li>* Systems analysis/structured analysis</li> <li>* Systems life cycle management</li> <li>* Relational databases</li> <li>* Distributed processing</li> <li>* Data management (e.g., data modelling)</li> <li>* Structured programming/CASE</li> <li>* Decision support systems</li> <li>* Assembly language</li> <li>* Expert systems/Artificial intelligence</li> </ul>	<p>Ability to:</p> <ul style="list-style-type: none"> <li>* work co-operatively in one-on-one and project team environment</li> <li>* plan and execute work in a collaborative environment</li> <li>* deal with ambiguity</li> <li>* work closely with customers and maintain productive relationship</li> <li>* accomplish assignments</li> <li>* teach others</li> <li>* plan, organise and lead projects</li> <li>* develop and deliver effective informative, and persuasive presentations</li> <li>* plan, organise and write clear, concise memos &amp; reports</li> <li>* be self-directed and proactive</li> <li>* be sensitive to organisational culture/politics</li> </ul>
<b>III. Technology management knowledge</b>	<b>IV. Business functional knowledge</b>
<p>Ability to</p> <ul style="list-style-type: none"> <li>* learn new technologies</li> <li>* focus on technology as a means, not an end</li> <li>* understand technological trends</li> </ul>	<p>Ability to</p> <ul style="list-style-type: none"> <li>* learn about business functions</li> <li>* interpret business problems and develop appropriate technical solution</li> <li>* understand the business environment</li> <li>* Knowledge of business functions</li> </ul>

**Table 2.4. Knowledge/skills requirements of IS professionals (Lee et al., 1995)**

In sum, the acceptance of the definition and the concept of information systems have given birth to a clearly defined inter-disciplinary academic study of information systems in many industrialised countries. Consequently, information systems related knowledge/skills requirements of those who produce and deliver information systems, and those who apply and use information systems have received significant focus in these countries. However, on the other hand, information systems incorporate technology, people, and organisations. Technology, people, and organisations in developing countries operate under different socio-political and economic realities. Studies conducted to understand IS knowledge/skill requirements in the context of developing countries are non-existent. Therefore, although the body of knowledge available in the industrialised countries is that of little use to us, one is compelled to review the literature with an aim to understand established theories and concepts. In the light of this, the literature suggest

three broad areas of knowledge/skills required by all organisational members:

- Appropriate knowledge/skills to understand information systems in general.
- Appropriate knowledge/skills to understand the business and its environment where information systems are applied.
- Appropriate technological knowledge/skills to develop and deliver or to operate and use information systems.

### **2.3. Development administration and IS implementation**

The term developing countries generally describe the 143 member countries of the United Nations that constitute the Third World (Todaro, 1985; Westlake, 1991). While almost all developing countries are poor in terms of money, they are diverse in culture, economic conditions, social and political structures (Torado, 1985; Ingham, 1993). Today, every developing country strives after development. Even though the term development was traditionally associated with aggregate economic growth, during the recent past, many writers have suggested that development is a normative and multidimensional concept, incorporating social, political, cultural, ecological, and economic dimensions (Vivekananda and Guha, 1985; Todaro, 1985; Ingham, 1993).

In almost all developing countries, the public administration plays a critical role in the process of socio-economic development and nation building. Consequently, development administration has become synonymous with public administration in these countries (Heady, 1979; Dwivedi, 1984; Turner and Hulme, 1997). The leaders of all developing countries have exhorted their citizens to strive for development. They have formulated policies and implemented a number of programmes of socio-economic development towards this end.

However, the achievement of development goals in a short time has proved elusive for all except a small number of countries (Turner and Hulme, 1997). All organizations exist in and relate to environments that affect their operations. Development administrations are no exception. The organizational environment is a vital element in influencing the

nature of policy, administrative reform or any programme of planned change. The environments in which administrators and policy makers operate in developing countries are both distinctive and diverse. Furthermore, as developing country environments are typically uncertain and growing in complexity the importance of environment for public policy and management increases. Some of the important elements of the environment which have been consistently appreciated, influenced and enacted by policy-makers, administrators and academics are describe below.

A major obstacle to the effective performance of public bureaucracies in most developing countries is the excessive concentration of decision-making and authority within central government (Griffin, 1981; Smith, 1985). It can be observed that the government's co-ordinating power is concentrated at the district level, with manageable area and population, and is in the hands of a single regional overload, while elected local bodies are weak or subordinate (Subramaniam, 1990). Although the popular remedy for such centralization is decentralization, experience of decentralization in less-developed countries has almost everywhere fallen short of expectations and the declared objectives of policy-makers. Both proponents and critics of decentralization strategies recognize that intentional decentralization faces considerable problems. On the one hand, national politicians are reluctant to cede power and while on the other, central bureaucracies resist the delegation of responsibilities.

In most developing countries, the colonial administrative structures continue with minor changes, and in general, there is considerable centralisation of administrative power (Subramaniam, 1990). A widespread criticism of this administrative structure is that it is too big and at the same time, too sprawling to come under effective scrutiny and control (Banerjee, 1985; Mehta, 1989). The bureaucratic structures generate dysfunctions, which adversely affect efficiency and effectiveness. The current structure of the public administration in most developing countries supports system maintenance instead of developmental outcomes (Mehta, 1989). Furthermore, there are simply too many personnel. At the same time, the present system does not promote an informal relationship of mutual trust between superiors and subordinates, which alone could pave the way for improved performance. In fact, the present system promotes the opposite.



Bureaucratic control is a prominent issue in post-colonial states, and today, bureaucratic control significantly constrains the performance of the public administration (Esman, 1988). However, bureaucracy is ubiquitous in developing countries. Bureaucracy within the public administration of developing countries evokes the slowness, the ponderousness, the routine, the complication of procedures, and the maladapted responses to the needs which they should satisfy (Crozier, 1994). Unusual delays in routine operations are caused by all kinds of checks that are prevailing in the system, controls, and blocks like audit, parliamentary and constitutional provisions including administrative laws, regulations, and so on (Banerjee, 1985; Mehta, 1989).

Cultural values always constrain administrative performance, and there can be no doubt that the public administration in almost all developing countries are heavily influenced by endogenous cultural factors (Turner and Hulmes, 1997). The literature points to a number of examples where the culture of developing countries (non-bureaucratic elements from the environment) penetrates the rational instrumentalities and creates deviant bureaucratic patterns. This in turn constrain the performance of the public administration in many developing countries (Hyden, 1983; Migdal, 1988). Official's commitment to some particular relations such as kinship, tribe, ethnicity, and religion override rational features. This particular commitment finds expression in favoritism, the importance of personal ties of patronage within bureaucracy, promotion based on who you are and not qualifications or experience, resource allocation to one's own group or region, and the appropriation of public resources for private purposes.

Attainment of accountability is a leading objective of most public administration reforms and involves much more than tackling corruption. According to Paul (1991), it is the driving force that generates the pressure for key actors involved to be responsible for and to ensure good public service performance. Unfortunately, in most developing countries, public servants are expected to be accountable to their immediate political bosses. Consequently, accountability becomes no more a technical matter. Instead, it is an exercise in power and politics (Subramaniam, 1990).

A number of writers point out that the public administration in developing countries should be perceived in a political context. They should be perceived as political systems in which coalitions form to pursue particular policy options and where there are relations to wider political structures within society (Clay and Schaffer, 1984). These writers see the structure of the state as an arena in which public officials and politicians build coalitions, bargain, compromise, co-opt, guard information and devise strategies in order to further their personal or organizational objectives. The objective is control over the policy process in areas that are of particular concern to the actors involved. The point to be noted in this context is that, often, the performance of the public administration is constrained by the nature of interaction between the political leadership and the public service (Carino, 1992). Consequently, there are always tensions and struggles as regimes try to dominate bureaucracies and bureaucracies fight back.

Although corruption is found in all countries of the world, it is a persistent feature of the political and administrative landscape of developing countries for many years (Harrison, 1981). Administrative corruption in developing countries include bribery, kick-backs on contracts, tips after important decisions, use of public resources for personal consumption, and so on (Gould, 1991). However, corruption has a negative effect on performance as the public interest is subsumed by the individual bureaucrat's pursuit of private gain.

Classes are large-scale groups of people who share common economic resources which strongly influence the types of life-style they are able to lead (Giddens, 1989). The class structure of developing nations display far greater diversity and complexity. The critical political issue relating to social class is whether people belonging to social classes or fractions of them move beyond a simple awareness of their similar class position to taking action based on their class interests. This class-consciousness is expressed, both implicitly and explicitly, within the public administration by interpreting it being established to maintain class interests (Turner and Hulmes, 1997).

The public administration in many developing countries has poor administrative capacity. Administrative capacity is a broad concept which refers to the managerial abilities of organisations (Umeh, 1992). There have always been reports of inadequate management skills and qualifications. But skill shortage very often may not simply be a matter of supply failing to keep pace with demand (Ruffing-Hillard, 1991). Political responsiveness has often been maintained against professional competence and a spoils system has frequently been able to hold out against a merit system despite administrative reforms. Qualified personnel may exist but this does not necessarily mean that they will be the ones employed.

The international environment has been of profound importance in determining the performance of public administration in developing countries (Turner and Hulmes, 1997). For example, the contemporary process of globalization, from the point of view of both socio-economic and socio-cultural, makes international factors increasingly important.

The main theme emerging from this discussion is a reminder that an administrative system that was originally designed by colonial powers to perform regulatory function in dependent countries was taken over by independent countries. Today, with some modifications, it is being utilized for the task of nation building. The value of the transferred public administration in the altered socio-political circumstances has always remained a controversial issue in almost all developing countries. The search for ways to mend its inadequacies gave birth to administrative reforms. Although the reform agenda has varied from country to country and through development decades, it has always been there. Some of the factors that administrative reform in developing countries has aimed to tackle are:

- **Restructuring:** Eliminating red tape, downsizing, decentralizing authority, improving organizational responsiveness to clients and so on.
- **Participation:** The participation of the public in shaping the activities of public bureaucracies.
- **Human resources:** Attention to matters of human resource development and human

resource management.

- **Accountability:** Making the public servant accountable.
- **Public-private mixes:** Cooperation of public and private organizations.

However, not many in developing countries would claim that their public administration is in reasonably good health. In fact, barring very few exceptions, not many areas have benefited through administrative reforms (Muttalib, 1989; Sahini and Vayunandan, 1992).

Today, many developing countries are making significant investments in ambitious programmes to develop large computer-based information systems within their public administration due to a number of reasons (Odedra, 1990; Kluzer, 1993; Grant, 1996). Overall, these investments are claimed to improve the performance of the public administration by improved access to information, thereby producing more informed, better-reasoned decisions (Baark, 1985; Hanna, 1994). There is no doubt that development administration is an information-intensive industry (Porter and Millar, 1985; Shams, et al., 1987). Access to information across various departments, and analysis of such information can make a difference in the quality of programmes that are initiated for promoting socio-economic development. The usefulness of computers to achieve this aim is beyond questioning. Computers can serve as an important tool in numerous functional activities of the core of the development process (Bhatnagar, 1995). Public bureaucracies were among the first organizations which introduced computers in developing countries to automate some of their activities that involved processing large quantities of data (Eade and Hodson, 1981; Hamelink, 1984; Porter and Miller, 1985).

To this end, the trend is continuing. For example, in Bangladesh, the National Committee on Computerisation (NCC) was set up in 1983 and was later transformed into the National Computer Board (NCB) to foster systematic absorption and utilisation of computers (Rab, 1989). Furthermore, the Bangladesh computer council was established in 1990 with the aim of absorbing, adapting and promoting IT for the socio-economic development of the country (Rahman, 1991). Policies in information technology have been evolving in India since 1971 with the setting up of the Electronic Commission and the Department of Electronics, directly

under the Prime Minister (Seshagiri, 1987). The National Informatics Centre (NIC) was set up in 1975 by the Government of India to play a promotional role in creating computer awareness and for developing and implementing computer-based information systems in the Ministries and Departments of the Central Government. In Singapore, the Committee on National Computerisation (CNC) was appointed in 1980 to promote the use and development of IT in Singapore. Furthermore, the Civil Service Computerisation Group (CSCG) was appointed to study the information needs of the civil service (Suwandi & Chong, 1989). In Malaysia, the powerful National Committee on Data Processing (NCDP) was established in 1985 to co-ordinate and control computerisation in the public sector. In Ghana, the Government Consultative Committee on Computerisation (GCCC) was set up in 1988 to advise the government on various facets of public sector computerisation. Furthermore, the Data Processing Control Board (DPCB) promotes computerisation in public administration, builds up professional manpower resources in data-processing and approves the use of computers in the public service (Odedra, 1993). Similar efforts and investments can be observed in almost all developing countries.

On the other hand, despite such efforts and investments, the overall objectives of introducing information systems within the public administration remain unfulfilled. There is only sporadic evidence to suggest that the increased use of computers by development bureaucracies have actually improved performance and productivity (APDC, 1987; Peterson, 1991). The point to be noted in this context is that the widely acknowledged significance of information systems, and their potential role in accelerating the process of socio-economic development in developing countries, has always remained a controversial issue (Rada, 1985; Lind, 1986; Kiggundu, 1990; Avgerou, 1995). Almost every writer who has written about the application of information systems for development administration has talked of more obstacles and failures rather than success stories (Shio, 1981; Neelameghan and Tocatlian, 1985; Avgerou, 1990; Bhatnagar, 1990; Peterson, 1990; Walsham et al., 1990; Peterson, 1991; Madon, 1994; Walsham and Sahay, 1996). The factors that cause such obstacles and failures, often implicitly, and sometimes explicitly mentioned by these writers are:

- Rejection by the participants concerned because it is alleged that the policies have been

imposed without consultation.

- Failure to recognise the importance of socio-political factors during systems design and development.
- Inadequate scientific, managerial and technological support.
- Failure of the designers to identify the information needs of the users.
- The process of introducing and institutionalising information systems is poorly understood.
- Poor training and motivation of staff.
- Lack of political support.
- Lack of co-ordination between information centres.
- Lack of proper equipment for acquiring and storing information.
- Poor dissemination of the available information to the users.
- Present information systems are catering only for the elite scientists groups.
- Control measures and evaluative criteria have not been included in the design of information systems.
- Information systems and services are under-utilised.

The main theme emerging from this long list is a reminder that the majority of factors that cause obstacles and failures to successful implementation of information systems are in fact socio-political in nature, often explicitly, and some times implicitly. However, in practice, policy-makers invariably focus on issues related to information systems related education/training, infrastructure, and resource management (APDC, 1987; Rastogi, 1987). To this end, developing countries can never be accused of giving scanty consideration to the problems related to information systems related education/ training. Although the information technology scene in all developing countries is not uniform, human resources have always been a matter of great concern to almost all developing countries. Almost every discussion surrounding information systems and developing countries has given importance to human resources. In fact, this is one of the few areas of agreement, both at the national and international level. For example, in the International Workshop (IFIP WG 9.4, 1991), which was organised to discuss the problems of IT manpower for developing countries, many participants pointed out that unsuccessful application of information systems in a number of organisations is a result of the lack of trained information analysts (Pawar, 1992;

Woherem, 1992). At the same time, there is also a general agreement amongst participants that in terms of manpower there exists a quality as well as a quantity gap in almost all developing countries. To this end, different countries have taken different measures to reduce the gaps in terms of their manpower requirements. For example, encouraging the private sector to play an active role in the supply of manpower, introducing new education/training programmes appropriate to the national context, increased financial assistance to existing education/training institutions, appointment of various committees to advise the government, introducing scholarships to go abroad for further studies - to quote some of the popular measures adopted by different countries (Seshagiri, 1987; Bhatnagar, 1992; Ojo, 1992; Nordin, 1992).

However, as already pointed out, IS failures within the public administration of developing countries are not caused by a lack of IS related education/training alone. The public administrations in developing countries operate under different socio-political and economic realities (Felts, 1987; Bell and Sheppard, 1988; Kiggundu, 1990). Furthermore, in many developing countries, the public administration operates as a sub-system of the political system in which it operates (Chowdhury, 1990). It has more interactions with the political system than with the economic or socio-cultural system. Consequently, there is an increase in the intensity of politics and institutionalization of political process within the public administration (Knights and Murray, 1994). This naturally leads to the constitution of a number of conditions that actually constrain the process of information systems development. These are serious issues that have to be considered by those who wish to study the application of information systems for development administration. In fact, it can be argued that unless and otherwise issues related to these factors are resolved, IS related education/training has only a trivial role to play. In this context, Peterson (1991) differentiates processing applications from analysing applications, and points to the constraints in development bureaucracies as they move beyond processing applications to analysing applications. Furthermore, Peterson (1990) argues that introduction of computers in development bureaucracies is totally different from institutionalising computers within development bureaucracies, and suggests that the significance of a computer application is more important than its simplicity in institutionalising the application in a development bureaucracy.

In sum, success stories of application of information systems in developing countries to accelerate socio-economic development, are in fact so few when compared to expectations (Lind, 1986). It appears that the focus is mainly on potential benefits rather than success stories. If computer-based information systems are to contribute to socio-economic development, then their application and use within the development administration need to be better understood in terms of socio-political and socio-cultural factors within the public administration.

## **2.4. The Conceptual Framework**

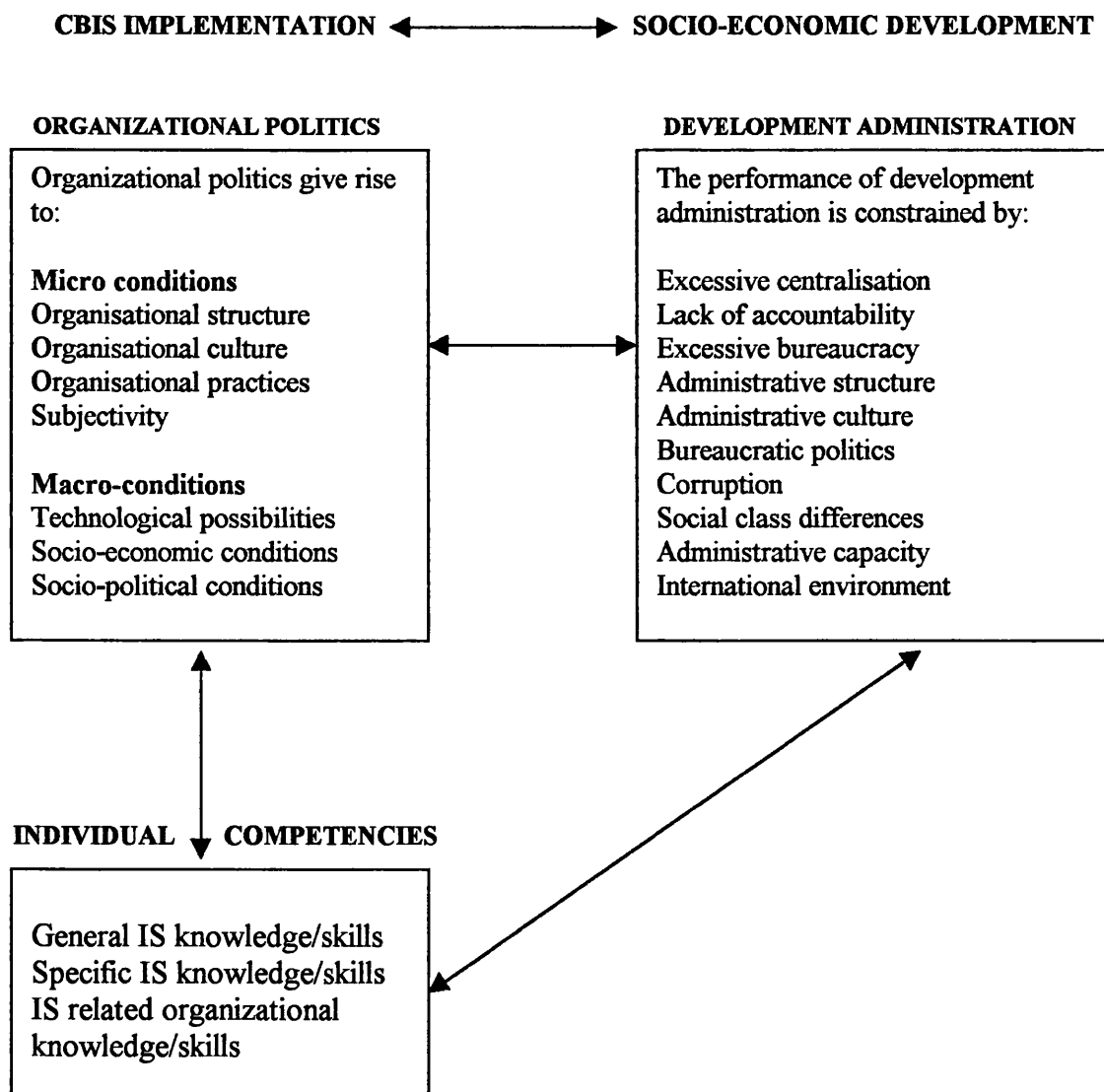
The review of literature in subject domains related to the current study was carried out primarily with an aim to build a conceptual framework within which the research can be conducted. To this end, the framework presented in Figure 2.2 establishes a conceptual link between three domains related to the current research. They are organisational politics, individual competencies, and development administration. It should be noted that the link between these three domains is established within the broad framework created by the relationship between CBIS implementation and socio-economic development. The model is based on the following concepts that became evident during the review of literature:

- Organisational politics give rise to micro (organisational) and macro (environmental) conditions that constrain the performance competent individuals associated with the application of information systems. These context specific conditions make certain courses of action feasible while constraining or ruling out others. Micro conditions are constituted by an organisation's structure, culture, practices, technological possibilities and by individual subjectivity. Macro conditions are constituted by the nation's socio-economic and socio-political conditions.
- The literature on IS related knowledge/skills suggest three broad areas required by all organisational members:
  1. Appropriate knowledge/skills to understand information systems in general.
  2. Appropriate knowledge/skills to understand the business and its environment.



3. Appropriate technological knowledge/skills to develop and deliver or to operate and use information systems.

- Many processes and factors have been identified as contributing to the poor performance of the development administration. They include excessive centralisation, lack of accountability among public servants, inflexible bureaucracy, inappropriate administrative structure, distinctive administrative culture, bureaucratic politics, corruption, prominent social class differences, lack of administrative capacity, and the influence of the international environment.



**Figure 2.2. Organisational politics, competency, and development administration**

It should be noted in this context that despite various efforts to improve the performance of development administration, barring very few exceptions, its performance has been dismal. The achievement of development goals in a short time has proved elusive for all except a small number of countries. Although the common assumption that development administration has totally failed is inaccurate, it is fair to argue that performances have been poor, particularly in relation to expectations associated with national independence. In the light of this, it can be suggested that almost all development administrations need to improve their performance substantially, and that they should deploy their resources more effectively.

## **CHAPTER THREE**

### **Research Method**

#### **3.1. Introduction**

Research is a search for knowledge to know and/or understand the real world. The nature of the real world - whether it is an ordered, systematic entity, or whether it is a flowing, unbroken whole - has always remained a great mystery (Habermas, 1972; Morgan, 1986; Gjertsen, 1989). Dichotomous assumptions about the real world have paved the way to dichotomous assumptions about how to approach the real world to search knowledge (Habermas, 1972).

Materialistic inquiry, generally referred to as positivism, starts with the fundamental assumption that principles of the real world are amenable to analysis and comprehension (Klein and Lyytinen, 1985; Rao, 1988; Crabtree, 1992). A materialistic inquirer aims at establishing cause-effect relationships in the phenomena around by structured observation (Walsham, 1993). Logically therefore, positivism suggests that behind the chaos of singular events there are unchanging, rational, coherent principles (Crabtree et al., 1992). In the search of knowledge, the positivist climbs a linear ladder to an ultimate objective truth.

An interpretative inquiry, on the other hand, starts from the position that reality is what people perceive it to be (Taylor and Bogdan, 1984; Walsham, 1993). This method of inquiry is also referred to as constructivism. The term constructivism implies that it is human constructions being studied, and it is constructions the researcher is creating (Crabtree et al., 1992). Logically therefore, interpretivism suggests that the real world is a response of the observer, and our knowledge of reality is a social construction by human actors (Walsham, 1993). While no two people share exactly the same real world, people who share a common culture see parts of the real world in a similar way. They are referred to as thought communities (Liebeneu and Backhouse, 1990). Clearly, value-free data cannot be obtained by constructivists, since they use their own preconceptions in order to guide the process of enquiry. During this process, researchers interact with the human subjects of the enquiry, changing the perceptions of both parties. Interpretivist methods of study aim to increase our

understanding of the world rather than knowing the world because there are no correct or incorrect view but different ways to view the world. As opposed to the positivist who climbs a linear ladder to an ultimate objective truth, an interpretivist enters an interpretive circle where the way to view the world is subjective (Crabtree et al., 1992)

Trying to compare the merits of the above two paradigms in detail is beyond the scope of this chapter - they are at best confusing too. On the other hand, both appear to be valuable in different realms, in different ways, and probably for different subjects of study. The materialistic method of inquiry may be appropriate for the natural sciences - but not necessarily for issues in the human realm. Affairs in the human realm transcend correlation and statistical significance. Therefore, it can be argued that to understand the complex and problematic nature of human behaviour and experience interpretivist method of inquiry may be more appropriate.

The selection of an appropriate research strategy to conduct meaningful research, therefore, will depend on our assumptions concerning reality (ontology), how to acquire knowledge of that reality (epistemology), and particular ways of knowing that reality (methodology) (Orlikowski and Baroudi, 1987; Craig Smith, 1988; Allan and Skinner, 1991). The aim of this chapter is to discuss the research strategy adopted for the current study and provide a rationale for the same.

### **3.2. Research in information systems**

Information systems are social systems, the scope of which extends beyond technology, and include organisational and behavioural aspects. Information systems, thus, emerge from the combination of knowledge from applied sciences (normal science) and social sciences (non-science or quasi-science) (Land, 1992; Walsham, 1993). On the other hand, applied sciences and social sciences are two distinctively different disciplines with fundamental differences concerning reality, types of knowledge which are considered valid, and methods of investigation (Galliers et al., 1992). The broader view of information systems, thus, brings with it added complexity, greater imprecision, the possibility of different interpretations of the same phenomena, and the need to take these issues into account when considering an

appropriate research approach (Land, 1987; Walsham, 1993). Furthermore, information systems is an extremely young discipline which has yet to attain a recognisable shape (Keen, 1987; Galliers et al., 1992). It has very few established themes, theory, and methods. While a number of researchers have attempted to identify some of the key issues in information systems requiring research, very little attention has been paid to the appropriateness of the research approaches to be adopted. These are serious problems that have to be overcome by those who wish to study information systems.

Many writers have written critiques concerning the use of traditional materialistic inquiry in the field of information systems (Land, 1987; Galliers et al., 1992). Those key characteristics and strengths of positivist approaches - objectivity, repeatability, reductionism, refutability, universality, predictability, and freedom from value - turn out to be weaknesses, or are at least problematic, when one considers research in information systems (Checkland, 1981). While rigorousness in, and validity of, research are something that every researcher must always strive for, rigorousness and validity in the context of information system are quite different from that of natural sciences. This leads us to the situation where the information systems researcher has to consider alternative research strategies and methods with appropriate philosophical bases, taking into consideration the nature of the research, and the phenomena under investigation (Galliers and Land, 1987). To this end, Galliers et al., (1992) suggest a taxonomy of alternative research approaches to information systems research (Table 3.1). The point to be noted here is that though a particular approach is likely to have its adherents who may argue for its universal applicability, an approach with universal applicability in the field of information systems is highly unlikely. On the other hand, some researchers advocate a combination of research strategies for studying issues in the field of information systems (Yin, 1989; Lee 1991; Layder, 1993; Gable, 1994). They view positivism and interpretivism as complementary, and argue that social reality is multi-dimensional, and therefore, a multi-strategy approach is required to elicit a richer picture of the real world. For example, the integrated framework established by Lee (1991) integrates the positivist and interpretive approaches into a single framework. The proposed framework consists of three levels of understanding (subjective, interpretive and positivist) and it fully recognises and incorporates the fundamental concepts of both approaches.

Approach	Description
Case study	An attempt at describing the relationships which exist in reality, usually within single organisations. It enables the capture of reality in considerably greater detail.
Action research	Applied research where there is an attempt to obtain practical results of value to groups with whom the researcher has allied him/herself while at the same time adding to the body of theoretical knowledge.
Phenomenological studies	An attempt at describing the relationships, which exist in reality which also, emphasises the role of the researcher and his/her interpretation of the topic of the study.
Futures research	Use of such techniques such as regression analysis and time series analysis or the Delphi method and change analysis, to extrapolate/deduce likely/future possible events or impacts.
Subjective/ Argumentative research	It is suggested to capture creative MIS research based more on opinion and speculation than observation. This kind of creative process makes a valuable contribution to the building of theories, which can subsequently be tested by more formal means.

**Table 3.1. Alternative research approaches to information systems research (Galliers et al., 1992)**

### 3.3. Methodology

The overall aim of the current research is to increase our understanding about the performance of individuals who are associated with the application of information systems within the public administration of developing countries. Performance of individuals on the other hand, as already discussed, is determined by individual competencies and the environment in which the activities of the individuals are taking place. The point to be noted in this context is that research in this domain is virtually non-existent. Therefore, achieving the overall aim of the current research involves trying to find answers to the following questions:

- What is the context of the current study?
- Why information systems are developed in this context at present?

- How information systems are developed in this context at present?
- Who are the organisational members associated with the development of information systems?
- Why do they participate?
- What are the activities performed by these members?
- How does the performance of these members affect the final information system?
- What information systems related knowledge/skills do they possess at present?
- To what extent they are using there IS related knowledge/skills?
- What are the factors that constrain them from using their knowledge/skills?

Addressing these wide-ranging issues presents an epistemological problem to the researcher for to a number of reasons. Firstly, the public administration in developing countries operates under different socio-political, socio-economic, business and technical realities. Secondly, organisational members and their activities are context dependent. Thirdly, the body of knowledge available through research in the advanced industrialised countries is of little use for the current study simply because the context being different. Fourthly, using this body of knowledge to guide the process of inquiry for the current study can be misleading. Finally, research in the domain of the current study is non-existent.

Many writers from the information systems research community point out that the most appropriate method available for a researcher under these circumstances, that is, where research and theory are at their early, formative stages, where the research issue appear to be very subjective, where there are no previous studies - is the in-depth case study method (Galliers et al., 1992; Walsham, 1993).

### **3.3.1. Case studies**

Case studies examine most or all the potential aspects of a particular unit or case (Merriam, 1988; Yin, 1989). In the context of research related to information systems, it is as an ideal method, when the major purposes of the research is to study concepts such as improving efficiency, improving effectiveness, information systems failures, information systems development approaches, impact of information systems on organisations, and so on

(Galliers et al., 1992). Case study research is also appropriate for *sticky, practice-based problems*, and this could be taken to include all aspects of information systems in an organisational context (Walsham, 1993). Galliers (1985) points to the strengths of the case study method as capturing reality in even greater detail than is possible using the survey approach, and dealing with an even larger number of variables than in the above.

On the other hand, there are criticisms too. The case study method is criticised for its weaknesses such as non-representativeness, lack of statistical generalizability arising from the work, restriction to a single event/organisation, the large number of variables and particular circumstances pertaining to individual situations, different interpretations which can be placed on reality by individual researchers, and so on (Lee, 1989).

However, these weaknesses of case study method seen from one ontological and epistemological point of view turn out to be strengths with changing ontological and epistemological point of view. For example, generalisation in the context of interpretivist tradition is quite different from that of the positivist tradition. There is no doubt that an interpretive research, based on case studies cannot offer generalisation in the statistical sense. On the other hand, it should be noted that there are no right or wrong theories in the interpretivist tradition but different ways to view the world. Researchers by declaring their beliefs and assumptions aim to create intersubjectivity, which in turn can offer generalisable concepts by means of logical inference (Craig Smith, 1988, Walsham, 1993).

### **3.3.2. Method of investigation**

If the case study method can serve as a possible research method, then, using the case study method, one has to find appropriate ways of investigation. The point to be noted here is that the current study is about the performance of individuals. Based on our ontological and epistemological beliefs - that the real world is socially constructed and it is human constructions that are being studied - it can be suggested that individuals, when involved in a particular activity in a particular context, interpret the situation, and act accordingly. Their interpretation is expressed in their action and practices. Researchers can interpret their actions, their constructions, and finally suggest positive changes for



the future. It should be re-emphasized at this point that it is human constructions that are being studied, and it is constructions the researcher is creating.

Different methods are available for an interpretivist to observe and interpret the activities of individuals. For example, soft systems methodology embodies a philosophy of organisational intervention that sees different individuals and groups as constructing interpretations of the world, the interpretations having no absolute or universal status. By constructing conceptual models of the human activity system, and by comparing these models with the real world, the researcher is able to understand the constructions of the actors (Checkland, 1981). On the other hand, Pettigrew's contextualist analysis embodies a philosophy which suggests that changes in context make processes emerge, and these processes in turn influence the context (Pettigrew, 1985). The researcher, by systematically studying and observing the processes, the context within which these processes have emerged, and the outcome, is able to interpret human constructions. Another methodology that gives explicit focus to human constructions is Hermeneutics.

### **3.3.2.1. Hermeneutics**

The word Hermeneutics is derived from Hermes, the Greek messenger god, and trickster, who carried messages from the gods to the people. His role was to interpret these messages from the gods and to make them understandable to humans (Crabtree et al., 1992). Though hermeneutics first began as the study of the translation and interpretation of sacred texts, today, it simply stands for the business of interpretation. The central task of hermeneutic analysis is the process of bringing a thing or situation from unintelligibility to understanding (Palmer, 1969). In this context, Gadamer (1976) suggests that trying to understand, take meaning from, or make intelligible that which is not yet understood is an essential aspect of our being in the world. A hermeneutic approach embodies the following assumptions (Crabtree et al., 1992, Addison, 1992):

- Participants of research give meanings to their actions, and these meanings are important in understanding human behaviour. Meaning is expressed in action and practices in addition to verbalising.

- Meanings are made possible by background conditions.
- The meaning and significance of human action is rarely fixed, clear, and unambiguous.
- Interpretation is necessary to understand human action.

In addition to these assumptions, the current research also draws inspiration from some of the practices pointed out by Addison (1992) that are central to hermeneutic researchers:

- Immersing oneself in the participants' world in order to understand and interpret the participants' everyday practices.
- Looking beyond individual actions, events, and behaviours to a larger background context and its relationship to the individual events.
- Entering into an active dialogue with the research participants, and his/her own values, assumptions, interpretations, and understandings.
- Maintaining a constantly questioning attitude in looking for misunderstandings, incomplete understandings, deeper understandings, alternative explanations, and changes with time and context.
- Addressing the practical concerns of the researcher and the research participants against a larger social, cultural, historical, political and economic background.

Accordingly, hermeneutic researchers approach a particular problem from a concerned, involved standpoint; immerse themselves in the participants' world; analyse human actions as situated within a socio-cultural and historical context; offer a narrative account of how a problem developed and is maintained; and offer directions for positive change.

With respect to research in information systems, Boland (1985) suggests that:

*... the use, design and study of information systems is best understood as a hermeneutics processes ... in using an information system, the available output is a text that must be read and interpreted by people other than its author. This is a hermeneutics task. In designing an information system, the designer reads the organisation and its intended users as a text in order to make an interpretation that will provide the basis for a systems design. This is also a hermeneutics task. In studying information systems, social scientists read the interaction during systems design and use in order to interpret the significance and potential meanings they hold. Hence, doing research on information systems is yet another hermeneutic task.*

It should be noted in this context that hermeneutics has a strong focus at the level of the individual, and individual acts of interpretation against a larger socio-political, socio-economic and historical background. Consequently, the study of the context becomes critical for hermeneutic researchers.

### **3.3.2.2. The context**

The study of the context is critical for any kind of investigation, especially for interpretative studies. Context locates events in space and time and gives them a past and a future, as well as the present that we see. It gives us the language to understand them, the codes to decode them, and the keys to their meaning (Morgan, 1988; Beardwell, 1994). Moreover, an event itself is embedded in its context: it is part of the web and cannot, therefore, be meaningfully examined separately from it. We cannot just wrench an event from its context and examine it in isolation.

There are various methods available to study and describe the context: Web Models as described by Kling (1982), contextualist analysis as described by Pettigrew (1985), structuration theory emerging from social sciences (Bryant and Jary, 1991) - all these methodological approaches provide valuable analytical tools to increase our understanding about the context. For example, Web models draw broad boundaries around the focal computer system and examine how its use depends upon a social context of complex social actions. The models define this social context by taking into account the social relations between the set of participants concerned with the information system, the infrastructure available for its support, and the previous history within the organisation of commitments made in developing and operating related computer-based technologies. On the other hand, Pettigrew's contextualist analysis involves identifying vertical and horizontal levels of analysis and the interconnections between those levels through time. While the vertical level refers to the interdependencies between levels of analysis based upon phenomena at a further level, the horizontal level of analysis involves the connection between phenomena in historical, present and future time. One of the principal concepts of structuration theory is that of a duality of structure, whereby agents and structures are not two independently given sets of phenomena,

but represent a duality whereby structure is drawn on in human interactions but, in so doing, social structures are reproduced.

The usefulness of all the above approaches in increasing our understanding of the context is beyond questioning. In fact, all these approaches have been extensively used by information systems research community to describe the context (Walsham, 1993). However, studies using any of these approaches to understand the actions of individuals associated with the application of information systems against a larger background context appear to be non-existent. To this end, the method described by Beardwell (1994) is considered particularly appropriate to the current study. When discussing about different strategies and factors that have to be considered in human resource development, the author acknowledges the prime importance of context, and uses the following approach to describe the context in relation to human resource development:

- **The immediate context** of human resource development is organisations. The nature of organisation and the way it is managed therefore constitute the immediate context. Because an organisation is a system of interdependent human beings, some of the critical elements that go to constitute the organisational context are: a) its ownership and source of authority; b) the purpose it is intended to achieve; c) the tasks that flow from these; d) the people who constitute it; e) the relationship between them; f) the relationship between people and tasks; g) tools and technology; and h) its boundary and relationship with what lies outside it.
- **The wider context** in which organisations operate could embrace an indefinite number of topics (Morgan, 1988). Clearly, covering such a vast range is a very difficult task for any researcher. Beardwell (1994) suggests that under these circumstances it is more appropriate, first to identify what we consider to be most important sources of influence upon the topic of study; and, second to explore these influences in a little detail.

### 3.4. Study design

The specific study design that is described in this section to address the overall aim of the current research is based on the concepts, which were presented in Section 2.4 of the previous chapter. The body of theory, researches, and practices that support these concepts were discussed in chapter two. The current study is performed through the following steps:

- Step one:** Select the country to conduct empirical work.
- Step two:** Select case studies.
- Step three:** Describe the macro and micro environmental conditions.
- Step four:** Collect data related to the case studies.
- Step five:** Group data in order to interpret the activities of organisational members.
- Step six:** Check data and repeat step 4 and 5.
- Step seven:** Interpret the activities of organisational members taking their IS related knowledge/skills and the environmental conditions (conditions that are created primarily by organisational politics) into consideration.
- Step eight:** Relate the performance of individual members to the success and failure of information system.
- Step nine:** Offer directions for positive changes for the future.

In this context, it is important to note that an interpretive study, which is adopting a hermeneutic approach, does not, and cannot follow any structured or algorithmic approaches as portrayed in the proposed study design. In the light of this, the current research design, presented to be consisting of nine linear steps should be considered only as a way of simplifying and documenting a complex set of research activities that are interrelated, interdependent and iterative.

#### **Step 1: Select the country to conduct empirical work.**

The country chosen to conduct the research is India. India presents an interesting case for the current study for the following reasons:

- India is a very large developing country.
- India's software exports by the private sector have achieved well-publicised success.
- Today, India is going through a process of restructuring its economy to emphasise competition and integration with global markets.
- The public administration in India has always remained an integral and inseparable part of the development process.
- Today, the Government of India is making significant efforts and investments to improve the performance of the public administration by introducing large computer-based information systems.
- There is a separate organisation - the National Informatics Centre (NIC) with more than 3000 professionals to design and develop computer-based information systems for the public administration.
- India has also a wide spectrum of educational/training institutions that offer information systems related education/training. Some of these institutions are internationally recognised.
- The public administration of India operates as a subsystem of the political system in which operates and has more interactions with the political system than any other system.
- The application of computer-based information systems within the public administration of India has left much to be desired. Almost all information systems within the public administration have numerous, serious deficiencies.
- Finally, the researcher has been to India previously on a number of occasions. He is familiar with the people and their culture.

### **Step 2: Select case studies**

Two case studies were chosen within the public administration of India to study the performance of different organisational members associated with the application of information systems.

1. The first case study, which is described in chapter six, is concerned with the introduction of a computer-based information system in the State of Tamil Nadu to administer a social welfare scheme. This particular information system appears to have gained so much

popularity, that at present, almost all the states in India that have similar welfare schemes seem to have adopted the same system. At the time of the study, the information system in the State of Tamil Nadu has been in operation for almost two years.

2. The second case study, which is described in chapter seven, is concerned with the development of a computer-based information system to administer the issue of import licences to registered exporters to import raw materials for export production. The Office of the Director General of Foreign Trade (DGFT) introduced this scheme, known as the Duty Exemption Scheme. The case study describes the development and operation of the computer-based information system within the Office of the DGFT in Tamil Nadu. This information system has also been in operation for almost two years at the time of the study. These two case studies were specifically chosen for the following reasons:
  - The systems analysts involved in both case studies were willing to share information, spare unlimited time to discuss various issues, and introduce all the organisational members who are associated with the application of information systems to the researcher. In a country like India, where the environment can be suggested to be much personalised, this was considered as one of the most important factor in selecting the case studies.
  - While the first case study is concerned with the State Government, the second is concerned with the Central Government. Informal discussions with professionals in India revealed the need to study both Central and State Government to obtain a holistic picture.
  - While the first information system is concerned with the poor, the second is concerned with rich businessmen. These differences are bound to have a marked effect on the activities of associated organisational members.
  - Both information systems are explicitly related to the process of socio-economic development. While the first is related to major social transformation, the second is related to economic transformation.
  - Both systems have been developed by the NIC and involved the participation of a number of organisational members who are working at different administrative levels within the public administration.
  - The researcher and the people of Tamil Nadu speak the same language – Tamil. This

made the researcher to be confident and comfortable.

### **Step 3: Describe the macro and micro environmental conditions**

The current study describes the context by using the method adopted by Beardwell (1994), that was discussed in this chapter under section 3.3.2.2. This particular method of describing the context in terms of wider and immediate context fits in neatly with the current study. On one hand, it presents a conceptually clear picture, which the researcher finds easy to relate to the current study. On the other hand, the researcher feels more confident in using this method because it has been used earlier under similar circumstances. In this context, the nature of the public administration and the way it is managed constitute the immediate context (micro), and the nation (India) in which the public administration functions constitute the wider (macro) context. The current study describes the macro context in terms of its historical, socio-cultural, political, socio-economic, technological and educational dimensions. It describes the micro context in terms of its structure, work practices, administrative culture, and technology dimensions (Table 3.2). While chapter four describes the macro context, chapter five describes the micro context.

### **Step 4: Collect data related to the case studies.**

Data was collected from almost every organisational member who was associated with the application of computers to the Social Welfare Scheme and the Duty Exemption Scheme (Table 3.3). The main objectives behind the data collection were to:

- Understand the process of systems development.
- Understand the activities of different organisational members associated with the process of systems development.
- Obtain the views of members about the information system as well as their views about other members who were associated with the process of systems development.



Research element	Level and units of analysis	Research strategy	Data sources
Context	<b>Macro conditions</b> Historical factors Socio-cultural features Political environment Socio-economic conditions Technological trends Educational features	1. Secondary data analysis 2. Primary data to some extent	Govt. publications Research studies Working papers Government Reports News papers/Journals Colleagues
	<b>Micro conditions</b> People Functions Structure Culture Technology	1. Secondary data analysis 2. Primary data to a good extent	Govt. publications Research studies Working papers Government Reports News papers Journals Colleagues

**Table 3.2. Study of the macro and micro context**

Research element	Unit of analysis	Data collection	Data sources
Activities of organisational members	Case study 1: The Social Welfare Scheme: The District Collector's Office – Madras	Informal discussions Direct observation Semi-structured interviews	Systems analyst (DIO) Systems analyst (SIO) The District Collector Staff at the Tahsildar's Office Pensioners DRS Tahsildar
	Case study 2: The Duty Exemption Scheme: Office of the DGFT – Madras	Informal discussions Direct observation Semi-structured interviews	The systems analyst The DGFT Exporters The JDGFT Controllers Dealing Hands

**Table 3.3. Performance of organisational members**

The data related to the case studies were collected on two occasions. First, when the researcher visited India for a period of two months in June 1994, and then during his next visit in June 1995, which lasted for a period of three months. As already pointed out, in 1994, both information systems have been in operation in the State of Tamil Nadu for almost two years.

In 1994, during the first visit, an overview of the systems development process was first obtained from respective systems analysts. Most of the questions that were put forward to the analysts were open-ended. For example, tell me how did this project start? Similar questions were designed in a particular sequence, which enabled the analysts to convey a great deal of information about the new system in terms of its initiation, analysis, design, operation, and maintenance. All information revealed by the analysts were noted down in paper. Recording of interviews was not considered for specific reasons. During the process of getting an overview of the system, the researcher contacted respective analysts on a number of occasions, primarily to clear doubts and obtain a clear picture. The point to note in this context is that at this point of time, the relationship between the analysts and the researcher was turning out to be more personal and informal. Hence, it is very difficult to quantify the meetings or interviews with the analysts (Table 3.4). The other members associated with respective information systems were contacted with the help of the analysts when the researcher had a clear picture of the systems development process and the current functions of the new systems (Table 3.4). Most of the questions put forward to these members were also open-ended. Their views and comments were recorded, again in paper. The point to note here is that, during the first visit, the researcher was primarily concerned about general information.

The data collected during the first visit were analysed and studied for almost a year until the next visit in June 1995. At this time, the case studies were beginning to reveal useful information. However, there were doubts too. Accordingly, during the second visit, respective members were contacted with specific questions. Although the researcher found it difficult to get answers for these specific questions, the repeat interviews confirmed the researcher's understanding about specific issues under study. Overall, with the exception of some top people like the Collector and the DGFT, each interview lasted more than one hour

and the interviews were done primarily in Tamil.

Organisational members	Number of Interviews in 1994	Number of Interviews in 1995
The District Informatics Officer	6	5
The State Informatics Officer	3	2
The District Collector	2	1
Staff at the Tahsildar's Office	5	3
DRS Tahsildar	2	1
Pensioners	2	2
Revenue Inspector	1	0
The Senior Systems Analyst	7	6
The DGFT	1	1
Exporters	5	5
Dealing hands	5	6
Controllers	3	2
JDGFT	1	1

Table 3.4. Number of interviews with organisational members

### Step 5. Group data in order to interpret the activities of organisational members

It was established in chapter two that the application of information systems can be conceptualised as a set of logical tasks. Furthermore, these tasks consist of a number of activities of different organisational members. Based on these concepts, data was grouped in a two-dimensional matrix (Figure 3.1). Each cell in this matrix contained the activities of a particular individual, his or her own views about the system, and the views of other members that are related to the activities of this particular individual (Figure 3.2). For example, cell A1 contains data about the activities of Member 1 during the stage of project initiation, along with his or her own comments/views about the system as well as the comments/views of other members.

	Project Initiation	Systems Analysis	System Design	System Operation
Member 1	A1			
Member 2				
Member 3				

Figure 3.1. Organisational Members and Activities

### Cell: A1

Stage:	Project initiation
Member:	Member 1
Activities:	Selected the particular project for computerisation. Requested the systems analyst to incorporate specific features in the new system.
Views:	“Member 1 did not state his requirements clearly at the time of initiation” systems analyst “The systems analyst does not know his job” Member 1.

**Figure 3.2. Project initiation and Member 1.**

### **Step 6: Repeat steps 4 and 5**

Steps 4 and 5 were repeated whenever there were obvious discrepancies to the story line.

### **Step 7. Interpret the activities of organisational members**

Hermeneutics was found the most appropriate method for interpreting the activities of organisational members. This is due to two reasons: 1) The current study focuses on individuals and that hermeneutics gives explicit focus to individual constructions. 2) There are interesting case studies in the information systems literature, which have used hermeneutics to interpret the activities of individuals. For example, Boland and Day (1989); Davies and Lee (1992); Addison, (1992). The researcher found these studies to be providing useful guidelines to conduct the current study. Furthermore, the empirical work is being carried out in India. Consequently, the researcher is able to understand the actions of individuals better.

Using our ontological assumptions, the activities of individual members are interpreted in chapter nine, taking into consideration the macro and micro context, and the IS related knowledge/skills of respective individuals. During this process, the comments and opinion of other members are also used as guidelines.

### **Step 8. Relate the performance of individuals to the success and failure of IS**

Describe how the activities of different organisational members have affected the effectiveness of the final system. The views of customers and/or beneficiaries are used to justify any specific claims. During this process, the following concepts emerge:

- A particular member had specific IS related knowledge/skills - the environment did not impose any constraints – he/she demonstrated a particular ability – this improved the effectiveness of the final system.
- A particular member had specific IS related knowledge/skills - the environment did not impose any constraints – he/she did not demonstrate any ability – this affected the effectiveness of the final system.
- A particular member did not have specific IS related knowledge/skills – he/she did not demonstrate any ability although the environment did not impose any constraints – this affected the effectiveness of the final system.
- A particular member had specific IS related knowledge/skills – the environment did impose constraints in using knowledge/skills – consequently, he/she did not demonstrate any ability – this affected the effectiveness of the final system.

### **Step 9. Offer directions for positive changes for the future.**

The current research is based on the concept that competent individuals and the right environment to direct individual efforts towards the achievement of a common purpose are one of the prerequisites for the successful implementation of information systems. By understanding the activities of a particular individual in a particular context, and by relating these activities to his or her IS related knowledge/skills and the context in which the activities are taking place, the current study offers directions for positive changes for the future.

## **3.5. Conclusion**

This chapter has argued that interpretive methods are most suited to address the overall aim of the current study because information systems are social systems. Using the case study

method as the research strategy and the hermeneutic approach as the method of investigation, it aims to interpret the actions and constructions of organisational members associated with the application of information systems in a particular context. By relating their performance to their information systems related knowledge/skills and the environment, it offers positive changes for the future.

## **CHAPTER FOUR**

### **The Macro Context: India**

Many general descriptions of India usually present only a partial and woefully incomplete image of India. The familiar one that dwarfs all others is that of a very poor country, with high rates of illiteracy, infant mortality, unemployment, and, most of the other human development indices being deplorably low (Balasubramanyam, 1984; Manorama, 1997). On the other hand, India has 5,000 years of civilisation; a civilisation that had reached the summit of human thought (Palkhivala, 1974). The aim of this chapter is to present a more balanced, and perhaps a holistic view of the macro context of the current study, by viewing India from its historical, socio-cultural, political, socio-economic, technological and educational dimensions.

#### **4.1. Historical background**

India is a vast country, almost a sub-continent. The regions that compose India are extremely heterogeneous in their resource endowments, climate, languages, and infrastructure (Balasubramanyam, 1984, Manorama, 1997). However, when the Portuguese and Dutch and British set up their trading stations, India consisted of a multiple of countries, each with its own government (Smith, 1958). In the course of time, the British became dominant and established themselves as the paramount power. In 1858 and in laws passed in later instalments, India was effectively taken over by the British Crown.

During the British rule, the government of India was centred on London, where a Council assisted the Secretary of State. Almost all the people involved in the apparatus of government were British. The highest positions in the administration all belonged to what was known as the Covenanted Civil Service (Mabbet, 1968; Edwardes, 1963). The country was divided into provinces, each of which had its own council. Most of the people in this pyramid of councils were also British officials. The Indians were not allowed to take part either in politics or in administration. At the beginning of the British rule, it was considered that the chief business of government in the country was the collection of revenue and the preservation of law and order (Griffiths, 1957). The subjects gave up the one, and got the

other in exchange. By the end of the century, the government was concerning itself with a wide variety of other matters, which had not existed before; road building, education, agricultural modernisation, and so on. The chief source of revenue was the taxes. Income tax, and other taxes were introduced more and more, and a mixture of different methods was worked out by British officials in different places since the collection of taxes by the Collectors raised the biggest problems (Edwardes, 1963; Mabbet, 1968).

In 1885, there rose an organisation in India called the Indian National Congress which took a very strong interest in politics, and made certain specific demands for the reform of the constitution of India, giving a voice to the Indians in running of the country (Griffiths, 1957; Edwardes, 1963). It was largely in the 1920s that a new, uncompromising generation of leaders appeared within the Congress, like Gandhi and Jawaharlal Nehru, who were squarely and firmly committed to getting complete independence without delay and without half-measures (Smith, 1958; Mabbett, 1968). In the course of time, the movement of *nationalism* also became more like a mass movement. In 1935, the British government had given India a new constitution, which put the day-to-day running of government into Indian hands, with the promise of more power to come later. New developments in the national and international front compelled the British to give independence to India, and India became independent on August 15th, 1947 (Smith, 1958).

Today, India is celebrating her fifty years of independence with nearly a billion people. India's development over the past half-century has been unique and commendable in many ways. Yet the record is disappointing in relation to what the country set out to achieve and could certainly have been accomplished (Manorama, 1997; Verges, 1997).

## **4.2. Socio-cultural context**

India is a new nation in which an old society is presently undergoing significant changes (Srinivas, 1966). To understand the socio-cultural context of modern India, it is necessary to take a brief look at the traditional Indian society first, and then look at the social changes that are taking place today within this society. This is because social changes in India occur through adjustments and not through displacements (Haragopal and Prasad, 1990).



India is primarily a Hindu country; 83.5 percent of the total population are Hindus (Manorama, 1997). Hinduism is the centre around which the whole of Indian social life rotates (O'Malley, 1964; Lannoy, 1971). The most significant feature of Hinduism is its extraordinary reliance on, if not inseparability from, three elements of social structure: caste, village community, and family system (Srinivas, 1966). A caste system is one whereby a society is divided up into a number of self-contained and completely segregated units (castes), the mutual relations between which are ritually determined in graded scale (Hutton, 1963). India is a land of villages. The village is the unit of communal life in India, and each village forms a separate community, a self-centred and largely self-supporting society (O'Mally, 1964). In almost all villages, one caste, either through numbers, riches, or hereditary status, is dominant. The family may be described as the fundamental unit of Indian society (O'Malley, 1964; Lannoy, 1971). Assessing the affection and sentiment in the Indian family is not an easy task. It is this intensity that determines the logic of obligations and adherence of influence. The father, who is the head of the family, represents some sort of authority and every member of the family must try to keep him happy. He is the decision-maker.

British rule, followed by India's independence, have produced significant changes in Indian society and culture, as new technology, institutions, knowledge, beliefs, and values were introduced. These changes are a result of new contradictions emerging in social, cultural and political life of the society (Haragopal and Prasad, 1990). With the promulgation of the Constitution on 26 January 1950, the individual citizen and not caste was declared the basic unit of Indian society. As a result, the role of caste system is changing. However, many argue that caste appears to be changing only in its external forms but not in content (Bhatt, 1985; Haragopal and Prasad, 1990). Today, it not only performs preservative role but also competitive role (Bhatt, 1985). The Indian family system, like caste, is resilient, and has shown great adaptability to modern forces. It is still true, however, that significant change have taken place. The dominance of head of the family is being questioned both by the wife and children. There is greater incidence of divorces, indicating an emerging crisis in family relationships. Today, the urban Indian scene is socially complex, with a mixture of communities of all classes living in loosely structured agglomerations (Nair, 1990). The most

affected groups are the middle classes and industrial proletariats. Improved global communications tend to make Western models the standard aspiration amongst the urban middle classes, far higher than the financial resources in India permit. The elite households have become articulators of the values of a highly competitive educational and employment system. Getting children admitted to good schools, supervising their curricular and extracurricular activities, and worrying about their future careers absorb the energies of parents.

The Indian society, largely, favours the game of chance over the game of competition. Life itself is considered one vast lottery in which the individual is subordinate to the collective. Implicit in their submission is the belief that not by any action of his own can a man attain a goal that is intrinsically beyond his reach (Lannoy, 1971). The individualistic orientation is one of the other dominant components of Indian social structure, i.e., - there is not much scope to accept other individuals as meritorious and much less, as equals (Haragopal and Prasad, 1990). The other important social characteristic is the process of deification of authority (Sharma, 1982). The ideology deifies head of the family, caste-head, Brahmin, the teacher and such other symbols. Any challenge to these symbols is considered a serious violation. The process of internalisation and accommodation have been very well developed and refined as a part of socio-cultural life of the society (Kosambi, 1981). Wherever contradictions become sharp, there are attempts to weaken them and internalise the opposite. To this end, it is observed that mode of production in India changed through adjustments and not through displacements (Haragopal and Prasad, 1990).

### **4.3 Political context**

India is a union of 25 States and 7 Union Territories. The Constitution lays down that India is a democracy, and provides a parliamentary form of Government for the Union as well as for the States. Accordingly, India has two tiers of government: the states, which run many of their own affairs, and the centre, with its federal government, with overriding powers throughout the country (Bhambhri, 1971; Vivekananda, 1981). The methods of electing the Government of the Union and the State are based on adult franchise. The Head of the country is the President. There is a parliament at the centre, with the Prime Minister and a

Cabinet. The cabinet formulates the internal and foreign policy of the Government. Besides the Prime Minister and the Cabinet Ministers, there are a number of Ministers and Deputy Ministers in charge of the various ministries that cover different sectors of the activities of the nation in serving the people. The Constitution has divided the subjects for law making between the Centre and the States. The State Legislature in each state is called the Legislative Assembly, for which people voted. The head of the state is the Governor, who is appointed by the President. The Governor is assisted by council of Ministers with the Chief Minister at its head. Today, the key issues relating to the political context of India is characterised by fragmentation, non-independence, and tensions between political parties and the bureaucratic machinery.

### **4.3.1. Fragmentation**

Apart from exceptional areas, every inch of India forms part of a District. Districts are created by State governments for administrative convenience. They have no independent existence on their own, and their boundaries are artificial. Most districts are sub-divided into Tahsils or Taluks, each containing 200-600 villages (Khanna, 1989). Rural areas in districts are divided into development blocks, usually covering around 10 villages. Adoption of the socialist ideology in socio-economic development combined with the rationale for decentralised planning gave birth to a new system of rural local government, called Panchayati Raj (Datta, 1985; Singh, 1989). The twin objectives of increasing agricultural production and removal of economic inequalities were transformed to Panchayati Raj Institutions (PRI) as agencies of the state apparatus (Singh, 1989; Rao, 1989). A major policy change that should have a hearing both on development and governance is the Constitution 64th Amendment Bill introduced in 1989 to provide constitutional status to Panchayati Raj Institutions (PRI) (Ghosh, 1989; Chandrasekar, 1989).

However, barring a few exceptions, legislation like the Panchayati Raj has done little in terms of empowering lower levels of the administration or politicians. Political and bureaucratic resistance at the state level to share power and resources with local-level institutions is often cited as the single most important reason (Rao, 1989; Singh, 1989). These writers also condemn related legislation on the ground that they enable the centre to enact legislation

concerning panchayats when such a thing should be left to the state governments, and that it provides access for the centre to the panchayats by means of direct financing of panchayats. It is also alleged to provide the basis for centralisation of power and not for decentralisation (Chandrasekar, 1989). Many argue that the decentralisation process must begin with the centre shedding its powers to the states, to be followed thereafter from the state governments to the PRIs. However, today, the fact remains that Panchayati Raj has brought politics to the village level, and the villager knows that his vote counts at the elections of the Panchayat.

### **4.3.2. Non-independence**

The Indian leadership, which fought for national independence, saw in federation a needed device to achieve their twin objective of national integration and economic development. Therefore, the framers of the Constitution devised a system in which the central government was expected to provide leadership to the states in matters of national importance (Maheshwari, 1981). Soon after Independence, and until the General Elections of 1967, India's central government effectively dominated the constituent states. According to Bhambhri (1991), this condition existed not because of any constitutional device, but because of the presence of three unique factors. They are 1) Nehru's leadership; 2) the domination of a single political party over both the central and state governments; and (3) centralised economic planning. The post-1967 election period saw the creation of a significantly different political milieu. Today, the trend is toward a politics of coalition - heterogeneous political groups are forced to forge unstable governments, which often collapse under the weight of their heterogeneity and internal contradictions. Thus the patterns of centre-state relations today depend on the relative power positions of the major political parties (Bhambhri, 1991).

### **4.3.3. Political parties and bureaucratic machinery**

Political parties, as organised media for the conduct of public affairs, play a vital role in the parliamentary set-up of the country (Bhambhri, 1991). On the other hand, defects of the political party system within the Indian democracy have been bitterly criticised in many quarters (Bhambhri, 1971; Vivekananda, 1981). Since independence, political parties have grown in numbers like mushrooms. These political parties emerge rapidly without any rigid

doctrinaire approach; subsequently, the parties exploit the existing social divisions or cleavages in the society in order to survive. When discussing about the political parties in India, Rudolph and Rudolph (1967) point out:

*"When an organised caste community is relatively homogeneous and cohesive and its common interests are still diffused and varied, it is likely to form a partisan attachment to a particular party and even to form and operate a political party of its own".*

Only a few political parties in India are well organised and fewer still are working at the national level (Brass, 1965). Most of the national parties do not have any party discipline, which can be enforced on the rank and file of the organisation. Certain reactionary forces within the party do not have any scruples to play their own politics irrespective of party ideologies or commitments even in situations where their party is a partner of a coalition government (Bhambhri, 1971; Vivekananda, 1981). Today, political parties, instead of selling their programmes and policies try to measure the constituency in terms of religious or caste arithmetic and search for candidates who qualify in that arithmetic.

The political parties maintain liaison with interest groups in the country and in turn get support from them (Vivekananda, 1981). The administrative machinery is fully used for party's interests by party leaders (Hartman, 1971; Vivekananda, 1981). No level of the administrative hierarchy is free from party pressures; the most infected by it is the district administration where one could easily notice a "give and take" between local party leaders and administrative personnel. For speedy action and for accelerating the administrative process, businessmen and locally influential people approach local party leaders who act as a link between the administration and the affected interests. Administrators in the government know that behind the pressures of local politicians is the support of higher level politicians like Members of Legislative Assembly (MLA), Members of Parliament (MP), and ministers.

Indian political field is also plagued by the presence of pressure groups (Vivekananda, 1981). These pressure groups are not attached to certain limited interests but rather have varied ramifications. Divisive forces like race, status, caste, religion and communal, linguistic, regional affinities and business interests are quite active. Suggestions advocated by certain groups, either for or against some policy, have concealed motives. The leading members of

the pressure groups by and large are by-products of certain important organisations connected with business houses. On the other hand, a considerable proportion of the members of the Indian Parliament have close links with business houses and landlords and are equally well associated with caste, religion, linguistic and regional movements.

The price of successful politics is very high in India (Bhambhri, 1991). The bulk of it has to be raised by each politician rather than be redistributed from a central party fund. The spiralling cost of winning elections and of nursing a constituency between elections is one major source of pressure on bureaucrats to be corrupt - pressure to which the transfer mechanism make them especially responsive. The Indian democratic system depends on the effective leadership of the Prime Minister, but coalition governments may be leaderless governments. The Indian political system expects the minister to provide leadership to his department and exercise effective control over the bureaucracy. However, a minister who is not sure of how long he will remain in the cabinet is unable to exercise such control. Moreover, he is very busy in manoeuvring his own survival and hence cannot guide, direct, and control his department.

#### **4.4. Socio-economic context**

India got Independence in a difficult situation: long colonial exploitation, ravages of the World War II, and partition of the country into India and Pakistan (Sen, 1983; Balasubramanyam, 1984). However, the dawn of Independence paved the way for taking steps to take the country out of the deep-rooted socio-economic crisis (Balasubramanyam, 1984). Since 1950, India's approach to socio-economic development has been within a framework of planning. The Government of India established the Planning Commission in 1950 - an autonomous, advisory and expert body - for assessment, utilisation and augmentation of material capital and human resources as well as for evolving a pattern of priorities, planning techniques, policies and methods to appraise and evaluate plans progress (Balasubramanyam, 1984; Singh, 1991). Broadly, the principal long-term objectives of Indian Five-Year Plans have been 1) rapid economic growth; 2) full employment; 3) self-reliance; 4) social justice; and 5) modernisation.

On the other hand, despite such measures, India's sheer size and diversity, her commitment to democratic socialism, the philosophy of a mixed economy, centralised economic planning, inward-looking Import-Substituting Strategy, export pessimism, over-bureaucratisation, and so on did exact a price: relatively slow and chequered socio-economic progress (Wadhva, 1994). Much more disconcerting was the fact that despite the growth in output, which the country has achieved, malnutrition, hunger, and unemployment continued to be the lot of a substantial number of the population.

All most all Committees set up in the 1960s to review the effectiveness of the government's economic policies referred to the need for economic reforms (Wadhva, 1994). Major policy initiatives were taken by the Government of India to bring about macro-economic stabilisation through fiscal discipline combined with a programme of reform of trade, industry and public sector policies (GOI, 1991; Bhagwati & Srinivasan, 1993). The Government realising the fact that controls breed inefficiency, corruption, and encourage smuggling, wanted to reduce the scope of licensing and bureaucratic regulations and controls that came in the way of Indian trade and Industry taking full advantage of the opportunities offered by the global economy (Singh, 1995).

On the other hand, the fact is that after eight five year plans, anything from 25 to 40 per cent of the population is still below the poverty line. The human development indices are deplorably low, placing India at the 126th position in the world table, far below many countries in East, Southeast, and West Asia and Africa that came to Independence much later (World Bank, 1993). The fertility rate remains high over large parts of the country, with correspondingly high rates of infant mortality, illiteracy and school dropouts. Unemployment is nagging problem with larger cohorts entering the labour market each year than the economy is able to absorb. Despite the constitutional injunction to provide free and compulsory education to all children up to the age of 14 by 1960, this goal is far from realisation. Likewise, the situation with regard to preventive, public and primary health, drinking water, sewage and sanitation, and housing is far from satisfactory. Another feature of the Indian social landscape is the wide disparity in incomes and standards of living between the various regions. For example, on the basis of net domestic product figures, some States are assigned to the high-income bracket, while others States belong to low-income

group.

It should be noted in this context that globalization has always been a matter of great concern to the policy-makers of India. For example, all the Five-Year Plans have repeatedly discussed the issue of globalization. To this end, in 1974, when the Government of India introduced FERA (Foreign economic regulation act) in order to bring global economy to India there was no going back for the economy. Today, the effects of Globalization have been enormous, and consequently, India's socio-economic front is witnessing a number of changes. Some of the manifested aspects of globalisation that India witnesses today include:

- Growth and decline take place simultaneously within some regions due to the tensions those results from participation in global operations and the local socio-economic context of the region.
- India's people and places have enhanced links with other parts of the world than ever before through issues such as trade, energy, employment, and communication.
- Indian local market is affected by overseas market and is unable to face the competition and standards.
- Significant changes are taking in the distribution of income levels due to rapid urbanisation.
- New structural adjustments are emerging in the form of new patterns and processes.
- Overseas market is maintaining its own quality, which is unable to satisfy the local population.
- India is moving towards economic diversification, particularly in the areas of light industrial development, manufacturing, financial services etc.
- Environmental resources are being exploited tremendously without sufficient concern for the long- term conservation of those resources.
- In terms of international trade, collective groups for trading purposes are emerging.
- Of all the 1000 odd Public sector companies nearly 200 of them are running in losses and are closing down unable to face strict regulations and quality standards.
- There is cultural shock as overseas products are new to the average Indian.
- The local unemployment and poverty level have increased.



## **4.5. Technological context**

India has had a strong scientific and technological culture (Rahman, 1984; Seshagiri, 1987). India's performance today suggests that it has the broadest and best-developed technological capabilities in the Third World (Lall, 1995; Singh, 1995). Since 1947, India has embarked on a programme of large-scale industrialisation, converting itself from a primarily agriculture-based economy into a highly industrial one (Gupta 1981; Bardhan, 1984).

Government technological policies until the early-1980s were shaped by Prime Minister Nehru and his daughter Indira Gandhi (Lall, 1982). Their governments, having a socialist vision of Government-owned enterprises controlling the national economy, have exercised pervasive, continuous but variable controls on practically every aspect of technological activity (Lall, 1985). Such controls stimulated a great deal of technological effort, and have enabled the country to build up a diverse and a fairly sophisticated base in industrial technologies (Desai, 1982; Lall, 1987). At the same time, the same set of policies have also fostered widespread areas of inefficiency and technological backwardness, and related policies (to promote public-sector enterprise, small-scale-industries, and national ownership) have prevented a full realisation of the technological capabilities that have been painfully built up in the country (Desai, 1982; Lall, 1987). Today, India is ranked fifteenth among the nations of the world in terms of industrial output, and her recent entry into the world markets as an exporter of non-traditional manufactures, has elevated her to the ranks of the developing countries collectively labelled as the Newly Industrialising Countries (Bardhan, 1984).

### **4.5.1. Information technology in India**

Policies concerning the information technology industry until the middle of 1980s have been shaped by India's overall industrial and technology strategy that emphasised the development of indigenous scientific, technological and industrial capabilities (Evans, 1992; Harindranath & Liebenau, 1995). Rajiv Gandhi, at age 44, was India's, and perhaps the world's, first high-tech head-of-state. As a pilot, he believed in technology. Since coming to power in 1984, the Government of Rajiv Gandhi singled out electronics for a series of policy reforms, and began

to promote the growth of the private sector in computing (Singhal & Rogers, 1989). The new computer policy announced by the government of Rajiv Gandhi in 1984 liberalised imports of computer components - encouraged subassemblies and kits through reduced duties (DoE, 1984). Government departments came under great pressure to adopt computers to monitor public projects, facilitate information processing, and enhance their decision-making capabilities (see section 5.6.1. in the next chapter for a detail description of the adoption of computers by government departments). Since the government of Rajiv Gandhi in 1984, every government that came to power placed even greater emphasis on the growth of the information technology sector (Harindranath & Liebenau, 1995; Singh, 1995). Today, the information technology industry can stand up to be counted amongst the industries, which are contributing to growth of the Indian economy. In fact, the industry is the most exciting area of the economy at present. It is under the twin influences of technological changes taking place all over the world and policy initiatives taken by the Government. There is not a single segment in the industry which has not grown, on the contrary, there is not a single segment which has grown less than 25 percent (Data Quest, August 1995). To this end, India's capability in software development is globally recognised (Vittal, 1995; Heeks, 1996). Today, the growth rate combined with the size of the market is simply attracting the multi national corporations.

Considerable misunderstandings about computerisation was deep rooted in India during the seventies, demonstrated by nation wide strikes organised by different employee Unions (Seshagiri, 1987). Since then, considerable amount of efforts have been made to educate the public as well as the politicians, probably with positive consequences (Singhal & Rogers, 1989). To this end, the workers today, by and large agitate only for proper consultations, and their retraining at the cost of the organisation. On the other hand, a large number of analysis reports on the implications of computers on employment combined with Parliament forums on Science and Technology has brought about a favourable political environment. As a result, the spread and influence of computers in the Indian society has come a long way in the last few years (Seshagiri, 1987; Varadan, 1988).

Today, computer systems are used in India for a variety of purposes by an enormous pool of users such as well-established capital-goods sector, consumer electronics, pharmaceutical

industries, large transport and distribution networks, growing financial systems, service organisations, and public administration and social applications (Table 4.1). It is even suggested that such a trend may soon make India join the league of Southeast Asian nations, which spend 1-2 percent of their GDP on information technology related products and services (Bhatnagar 1995).

Segment	Usage (%)
Exports	21.24
Government	16.68
Manufacturing	16.54
Banking	9.21
R & D and education	8.43
Telecom	2.78
SOHO	5.00
Energy	1.83
Other services	3.94
Others	14.35

**Table 4.1. Application areas (Source: Data Quest: August, 1995)**

Several large On-line transaction processing systems have been implemented in India; these include the Indian Railways' passenger booking system, Indian Airlines' passenger reservations and departure control system, betting systems and race courses etc. In addition, a few large vehicle manufacturers have also introduced systems for shop floor control, inventory control and purchasing. Some banks have introduced ATM services to a limited extent and several state transport corporations have computerised bus reservation systems. The tremendous freedom made available to the Indian banks in modernising their operations by the computerisation agreement signed by the Indian Banks' Association with Unions during October 1993 have made the Indian Banks to invest in a big way in information technology. The National Informatics Centre (NIC) has developed several social applications in rural health care, rural development, employment and labour market, public distribution of food and civic supplies, education administration, natural resources management, district administration, and public information (see Annex 5.4 and 5.5. in the next chapter for a

comprehensive list of applications developed by the NIC for government departments).

While India can no doubt be proud of its performance, there are constraints too. The adoption of computers by different organisations in India is constrained today by a number of factors, such as:

- **Computer culture:** Perhaps India's major stumbling block is the absence of a computer culture. Barring very few exceptions, such as the scientific research institutions and the military community, using computers to facilitate management decision-making is relatively a new concept (Singhal and Rogers, 1989).
- **Government bureaucracy:** India still has the largest and most inefficient government bureaucracy in the world. Slow government procedures prevent faster absorption of computers both within and outside government departments (Hanna, 1994).
- **Limited manpower:** There are a number of studies showing a wide gap between the available versus required manpower resources (Pawar, 1992; Bhatnagar, 1992). In addition, hundreds of graduates migrate to the US each year.
- **Language:** While computer literacy, largely, is directly related to proficiency in English, only two percent of India's population speaks English (Singhal and Rogers, 1989).
- **Lack of R&D:** There is a lack of collaboration between government, industry, and academic institutions (Mitra and Mandke, 1995).
- **Electric Power:** The demand for power has been far ahead of the supply in almost all states in India. Fluctuating voltage and sudden power-cuts have become norms. With liberalisation, entry of private, and foreign companies into the power sector is expected to change the present situation significantly (Budget Speech, 1997-98).
- **Telecommunications:** India faces a dilemma in seeking to fill the gap between supply and demand for telecom services, including the more advanced data and value added services. The set up of data communications and network-based value-added services is rudimentary (Hanna, 1994; Cheung, 1996). Even by developing country's standard, India has one of the lowest telephone penetration rates at just 1.4 telephones per 100 people. The official waiting list, which usually underestimate the true demand is about 2 million people (Cheung, 1996).

## 4.6. IT Education/Training

The 1984 computer policy with its liberal framework created a parallel acceleration in the demand for a large number of personnel with varying IT related knowledge/skills (Data Quest, June 1995). The first meaningful discussions on the demand/supply and quantity/quality mismatch started around 1985. The appointment of various committees from time to time to find ways to reduce the quality/quantity mismatch led to the realisation, amongst others, that the formal Government educational/training institutions alone would not be able to deal with the manpower requirements. It was obvious that the non-Government sector would have to play a significant role (Bhatnagar, 1992; Pawar, 1992). Accordingly, major policy initiatives were taken by the government of India to encourage both government and private sector to start a variety of IT education/training programmes (Seshagiri, 1987). Today, there appears to be a wide spectrum of educational/training institutions in India, which offer IT related education/training, and their number is on the increase. In fact, recent studies on manpower requirements tend to suggest that the demand in terms of quantity could be easily met with the existing infrastructure, though quality still remains a controversial issue (Chopra, 1993). To this end, it is important to note that, barring very few exceptions, almost all institutions which offer IS related education/training are primarily engineering/technological institutions (Mitra and Mandke, 1995). Informal discussions with faculty members suggest that the majority of teaching staff hold engineering degrees.

The phenomenal expansion in the number of both formal and non-formal institutions has inevitably given birth to a variety of educational/training programmes with different titles and duration. However, the fact that someone holds a particular degree/diploma from a particular institution is no guarantee that he/she can be equated with someone else with the same degree/diploma gained from a different institution. The current study classifies the variety of educational/training programmes available in India today under four broad categories, according to their orientation:

**Computer science courses:** Computer science courses, ranging from Diplomas to Ph.Ds, are suggested to be rich in concepts, but with minimum preparation towards application (Data

Quest, June 1994; Mitra & Mandke, 1995). As the title suggests, they focus heavily on the technological dimension of information systems i.e., hardware and software. They principally teach how computers work. Many of these courses enjoy monetary support from the Department of Electronics. Depending on the entry requirements, duration of the course, modules taught, and the nature of jobs on offer to graduates at the end of their studies, computer science courses can be classified into Diploma courses, Bachelor degrees, Master degrees, and research degrees.

**Computer application courses:** Different studies on IT manpower requirements have repeatedly pointed out that the type of specialists organisations in India require most today are systems analysts and programmers - of these two categories, systems analysts are more difficult to get (Bhatnagar, 1992). Perhaps the most recent study has indicated that the demand for personnel with appropriate knowledge/skills to design and develop computer applications suitable to the Indian context is very large and expected to grow rapidly (Hanna, 1994). In fact, computer application courses emerged in India during the 1980s due to the lack of preparation towards the application of computers by computer science courses. However, today, these programmes are criticised for overemphasising on software skills while ignoring the knowledge component (Mitra and Mandke, 1995). For example, most of the degrees on computer application have failed to produce systems analyst. Graduates who have completed these courses are employed as programmers (Bhatnagar, 1992).

**Computer awareness courses:** Computers as a subject in other degree curricula are not a common phenomenon even today in India. However, a notable feature in most of the management courses today is that information systems form a significant part of their study. For example, the Post-Graduate Programme in Management offered by the IIM, Ahmedabad, not only incorporates 'Computers and Information Systems' as a compulsory module in the first year for all students, but also offers an advanced version of this module as an elective in the second year for interested students. While the compulsory module aims to expose students to developments in computer technology and the working of a computer system, the elective aims to provide basic knowledge about computer hardware and software which will enable managers to evaluate computer systems.

**Short-term courses:** Barring very few exceptions, short-term education/training is the

exclusive preserve of non-formal institutions. While training on a specific platform for specific applications remains a universal requirement of most user departments, formal institutions do not appear to have geared to meet such requirements. Some of the large and popular non-formal training institutes in India such as NIIT, APTECH, INFOTECH and so on claim that students with formal degrees only have theoretical knowledge of computers which is of no use to the business community. The business community needs people who have a good working knowledge of different application packages and who are in a position to commence work immediately. However, university graduates with formal degrees are good only in systems software, but not in applications software. Today, short-term training is a thriving business in India not only because students with formal degrees want to expose themselves to the latest application software, but also due to the retraining needs of the business community arising due to technological changes.

Finally, any discussion about IT education and training in India is not complete without some form of discussion about the IT Task Force. The IT Task Force was set up by the Government of India in the year 1998 under the leadership of the Prime Minister of India. The chief Minister of Andhra Pradesh, Chandra Babu Naidu is the chairman of the committee. The committee consists of the Union Minister of Science and Technology, Union Secretary of Science and Technology, Chairman of the NIC, and a leading businessman from the IT industry. The main objectives of the Task Force is to:

- Develop IT in India to benefit the common man
- Promote India's IT capabilities on a global scale
- Promote IT education and training in India

Today, due to the efforts of the Task Force, the Indian Institute of Information Technology (IIIT) has been established in Hyderabad. The institute is conducting a number of software and hardware related courses at present. However, on the other hand, the composition of the committee as well as the nature of courses that are being conducted at the IIIT at present tends to be more IT related rather than IS related. In the light of this, what the task force is able to achieve in terms of IS education and training remains to be seen.

## 4.7. Summary

This chapter has described India's historical, socio-cultural, political, socio-economic, technological and IT related educational dimensions. The aim of this description is to interpret the activities of different organisational members associated with the application of information systems within the public administration, against these macro contextual conditions. To this end, this chapter has established that:

- India was never a united political entity. It was the British who welded India into one country. It is only after national Independence that Indians have started to rule their own country as a single political entity. This is a very complex task when one considers the heterogeneous nature of regions that compose India.
- In one form or another, the Indian society has always remained a stratified social system. Throughout history, there have always been caste disputes, there have always been a lot of pushing and jostling in the attempt to go ahead, and there have always been struggles towards upward mobility.
- Politics and corrupted politicians are integral parts of most administrative activities. The administrative machinery is fully used to gain political advantages. A good number of politicians are known for corruption, murder, banditry and illiteracy.
- India is now in the process of liberalising its economy. Consequently, the environment today is more competitive. On the other hand, malnutrition, hunger, and unemployment continue to be a nagging problem.
- The spread and influence of computers in Indian society is on the increase. However, there are constraints too.
- Baring very few exceptions, all most all information systems related educational/training programmes in India today either overemphasise on the theoretical and/or practical issues of computer science or they concentrate on 'keystroke' level of training for using



application packages. In other words, they impart knowledge/skills in the area of information technology rather than the use of information technology in business, which is totally a different subject in itself. Hence, they fail to address other dimensions of information systems such as technology customisation and adaptation issues, management and operationalisation of technology and so on. Moreover, they have completely neglected knowledge/skills needed by users for information analysis, information systems management, technology management and so on. Informal discussions with academics suggest that it is the same computer science curriculum taking different names and forms for different courses without many changes in underlying concepts. Even those courses that claim to produce systems analysts have more number of modules that are related to programming and computer architecture than modules related to systems analysis. Even management science students are exposed to more of technology rather than concepts related to technology.

## CHAPTER FIVE

### The Micro Context: The Public Administration in India

#### 5.1. Introduction

The aim of this chapter is to increase our understanding about the public administration in India - the micro context of the current study. The present public administration in India has been shaped by two different sets of influences: British traditions of the past, and the democratic welfare state of the present (Dwivedi & Jain, 1984). Over a period of time the British Government in India had devised a system of public administration which unified the whole country under a single line of command. The administrative system was marked by a few features, the most distinguishing among them being, a strong central government which exercised effective control over the lower level of government, an elitist structure of civil service (Indian Civil Service - ICS), and the overriding importance accorded to the district and its presiding officer, the District Collector (Maheshwari, 1981). Such features were required to achieve some important objectives of the colonial government such as the maintenance of law and order in the country, the collection of revenue necessary to meet its expenditure, the retention of strategic powers in the hands of the British civil servants, and the subservience of public administration to the paramount needs of Great Britain (Khanna, 1968; Maheshwari, 1981).

With the ringing out of the colonial rule in 1947, Independent India inherited the administrative system with those features that were originally incorporated by the British to perform regulatory functions in a dependent country. However, as the state became obliged to take up a vast array of new functions, mostly in developmental and promotional fields, in fulfilment of the promises made by the national political leadership in the course of India's struggle for independence, those original objectives of governance ceased to be either valid or sufficient in themselves. The value of the transferred public administration in the altered socio-political circumstances was repeatedly questioned by prominent national leaders (Khanna, 1968; Rao, 1989). Such distrust in, and belief in the unsuitability of public administration led the Central Government of India to take various measures to reform and revamp the administrative system of the country.

On the other hand, the public administration of India has always remained an integral and inseparable part of the development process in India. The Five-Year Plans have repeatedly emphasised its role in socio-economic development in terms of managing the infrastructure; speedy disposal of matters; and responsiveness to developmental needs (Singh, 1991). At the same time, each Five Year Plan document also devoted a chapter to suggest measures to make the public administration a fit instrument of development (Nahbi, 1997). Thus, the quest for an effective administrative system began in India with the growing realisation about the serious inadequacies of public administration in terms of the tasks set before it. The search for ways to mend these inadequacies resulted in significant enrichment and extension to both its concept and content (Maheshwari, 1981; Sahni and Vayunandan, 1992).

## **5.2. Administrative reforms**

Administrative reform in India owes itself to three principal sources: it has come as a by-product of the general political process – or, has emanated from bodies specifically charged with the responsibility of suggesting administrative reform – or, the Central Reform Agency which is an integral part of the machinery of government (Maheshwari, 1981; Muttalib, 1985). Administrative reformers raised, and offered to, a large number of questions covering both the traditional administration and development administration. According to Maheshwari (1981), the more important ones are:

- How should the machinery of government be reorganised?
- How should procedures of work be improved?
- How should financial administration be conducted in the context of planning?
- How should planning be organised at different levels of government?
- How should better co-ordination be secured between various agencies?
- What should be the relationship between ministers and civil servants?
- How should the various processes of personnel administration such as recruitment, training, placement, performance appraisal, promotion, salary-fixation, etc., be improved?
- What should be the staffing policies in the government, particularly at the senior level?
- How should the grievances of the public personnel be redressed?

- How should corruption be controlled in public administration?
- How should citizens' grievances be redressed?
- How should waste and extravagance in public administration be controlled?
- How should public undertakings be organised?
- How should project planning be organised and control mechanisms designed?
- How should plan progress be monitored and programme evaluation be carried out?

In sum, India can never be accused of giving scanty consideration to the problems of change in its administrative system. In fact, overseas commentators of the Indian Administrative system are easily impressed with the large stock of knowledge about what needs to be done to make the country's public administration a fit instrument for the tasks set before it (Braibanti, 1993).

On the other hand, not many in India would claim that the country's administration is in reasonably good health. In view of the scale or volume of know-how available in the field of administrative reforms, the impact has been rather marginal (Muttalib, 1985; Sahni and Vayunandan, 1992). The citizens by and large regard the public administration as unresponsive, wooden, at times even inhuman (Maheshwari, 1981). Today, almost all political parties in India unanimously agree that public administration is inefficient, wasteful and insensitive to citizens' convenience. Lack of commitment on the part of both political leadership and senior bureaucracy is often cited as the single most important reason for the failure of reforms - though this group misses no opportunity to call for institutional and behavioural changes in public administration (Maheshwari, 1981; Rao, 1989). While the political leadership is more in love with apparently spectacular and publicity yielding events, the senior bureaucracy is over-committed to the prevalent administrative ethos, and unless it is powerfully pressurised will either not move, or move slowly, even in circles. The next reason on the list is resistance. Though resistance is a universal phenomenon, it is much more intense and resolute in the case of public bureaucracy, especially when it fears an adverse effect on its own status and role. Another impediment to administrative reforms is that the machinery of public administration is too sprawling to come under effective scrutiny and control. The growing unionisation among the public personnel themselves is an other obstacle, which tend to make reforms difficult. Barring very few exceptions, not many areas

have benefited through administrative reforms. Some of the areas, which have not benefited through reforms, and which are very relevant to the current study are a) Decentralisation; b) Training; and c) Corruption.

### **5.2.1. Decentralisation**

The partition of the country at the time of Independence resulted in a fearful constituent assembly opting for a strong centre (Rao, 1989; Singh, 1989; Mukarji, 1989). The planning regime that came into being acted as a powerful centralising force. Central planning was backed by central financing. The union began doing much of the states' work, and the states in turn did the same in respect of the districts. In this way, centralisation at the national level reinforced centralisation in the states (Datta, 1985; Mukarjee, 1989).

It was later realised that the upward shift of functions, from the districts to the state and from the states to the union, has not in the least contributed either to strengthening the centre or to be making planning more effective (Mukarjee, 1989). These developments made various regimes to think in terms of reversing the upward trend; decentralising functions from the union to the states and from the states to the districts. Improvements in productivity through speedy absorption of technology as well as better allocation and utilisation of the available resources and greater impact of such productivity improvements on the living conditions of the weaker sections of the population were sought to be achieved through decentralised planning (Rao, 1989; Singh, 1989).

However, despite various efforts to promote decentralisation such as the establishment of local government, the expansion of Panchayati Raj Institutions and so on, barring few exceptions, the performance in respect of decentralised planning has been dismal (Datta, 1985; Ghosh, 1989; Chandrasekar, 1989). This can be ascribed to one or more of the following reasons: a) Political and bureaucratic resistances to share power and resources; b) Technological changes introduced were exogenous; c) Rural elite were not interested in programmes which benefited mainly the poor and the under privileged; and d) Initiative for institutional changes came from the central leadership.

### **5.2.2. Training**

Training has always been looked upon as a decentralised administrative reform by reformers in India (Maheshwari, 1981; Sanwal 1988). It was believed that individual civil servants would get better equipped to perform their functions, which would cumulate into over-all efficiency in public administration. Such a view gave birth to a large number of training institutions, within, or on the periphery of, the public administration. Today, all members of the civil service have to undergo some form of training – both general and IT related; the frequency and duration of which vary according to the nature of their job.

On the other hand, post-training evaluations indicate that only a very few individuals have introduced changes in their departments based on the training programme (Sanwal, 1988).

Many writers believe that though a training programme promotes varying measures of personal enrichment its contribution to the over-all efficiency of the organisations to which trained civil servants are posted is rather questionable (Maheshwari, 1981; Sanwal, 1988). This is because the system inevitably overtakes trained personnel - in the process rendering largely ineffective whatever they had learnt in their training. However, it should also be noted at the same time that the training programmes as conducted at present are not free from weaknesses and shortcomings. The greatest single criticism made is that they have a low degree of relevance because they do not fully take into account, and get linked with local politico-administrative realities (Sanwal, 1988). Other serious shortcomings of in-service training programmes are: a) Lack of real interest and commitment on the part of top political leadership and senior bureaucracy; b) Attitudes of civil servants; c) Lack of motivation; d) Poor methods of selection of trainers and trainees; and e) Irrelevant training programmes.

### **5.2.3. Corruption**

Another area where administrative reforms have failed to work is corruption. This is partly due to some people having a vested interest in keeping public administration in a state of disarray and disjointedness (Maheshwari, 1981; Sahni & Vayunandan, 1992). At the same time, today, the rich businessman, the politician and the civil servant have by and large learnt to accommodate each other. The middle class, too, has acquiesced into the system although

it continues to be a sharp critic of the administration. The hardest hit is the poorer class. Today, for a large number of common items of work done by public functionaries the amount of illegal gratification has been standardised in many parts of the country.

### **5.3. Administrative structure**

The Union (Central) Government operates through its Secretariat. The Secretariat is the principal executive instrument of the Union Government, and is responsible for co-ordinating the multifarious activities of national importance and assisting in the formulation of foreign, economic, social, and financial policies (Bhambhri, 1971). The Secretariat is divided into Ministries among whom the various subjects of governmental activity are distributed according to administrative convenience. The major ministries in the Government of India as of 1996 numbered thirty-nine (Manorama, 1997). A ministry may be made up of one or more allied departments or may not have any separate department as such. A ministry is headed by a minister, assisted by a secretary who has under him additional secretaries, joint secretaries, directors, deputy secretaries, under secretaries, and the section officer who heads a section comprising assistants, upper and lower division clerks, typists, and so on (Table 5.1) (Khanna, 1968). Such a hierarchical structure is believed to assist the minister in policy making, the overseeing of policy execution, the evaluation of plans and programs, and to undertake activities necessary for performing these functions (Maheshwari, 1990).

While the policy-making organ of the government is the Secretariat, execution of policies and programs are left to another set of organisation, the attached and subordinate offices. These offices are an outgrowth of a belief in the dichotomy of policy and administration (Maheshwari, 1990). An attached office is a repository of technical knowledge on a particular subject that a ministry utilises in its tasks. Below the attached offices are the subordinate offices. These field establishments execute the policies and programs of the government of India. Thus, an overriding belief in the desirability of structural separation of policy making and administration has led to the creation of an organisation that is concerned exclusively with policy making and another that is charged with implementing responsibilities.

<b>Position</b>	<b>Functions</b>
Secretary	<ul style="list-style-type: none"> <li>* principal adviser of the minister in matters of policy and administration</li> <li>* responsible for efficient and economic administration of his department and the attached and subordinate offices and other organisations which it controls</li> <li>* represents the departments before the Parliamentary Committees.</li> </ul>
Additional/Joint Secretary	* in-charge of a wing with full authority to dispose of business arising in his charge
Deputy Secretary	* controls a division comprising two branches
Under Secretary	* in charge of a branch comprising two sections
Section Officer (Superintendent)	<ul style="list-style-type: none"> <li>* supervise a section</li> <li>* take decisions on simple cases</li> </ul>
Assistant	* decide precedence, examine the relevant rules and orders and make suggestion for the disposal of references
Upper Division Clerk	* look into simple cases and assist in their disposal
Lower Division Clerk	* purely routine clerical duties

**Table 5.1. Personnel and functions (Khanna, 1968)**

Similar to that of the Union Government, the business of a State Government is also transacted in Secretariat Departments (Majumdar, 1987). A Department is a unit of administration among which the business of the government is distributed in accordance with the statutory rules. The Planning Department in the States came into existence after independence. It is the function of the Planning Department to scrutinise the departmental planning schemes in the context of priorities fixed by the Planning Commission.

The Indian district administrative system is considered to be a vital part of Independent India's administration for the speedy and proper implementation of all programmes for the development of the district and the welfare of the people, particularly those living in rural areas (Mehta, 1989). The structure of the district administration consists of a number of agencies of government working at the district level, including the Collector/Deputy Commissioner, the Superintendent of Police, field representatives of various departments and other departments, community development personnel, municipal councils and institutions of



Panchayati Raj. Each of these agencies performs separate functions but at the same time attempt to co-ordinate their work mainly through the Collector/Deputy Commissioner, who is the apex authority of district administration. The Collector/Deputy Commissioner has the overall responsibility for directing all the component parts of the machinery of district administration towards the common objectives of the government. Therefore, the District Collector can be considered as the linch-pin of the district administration (Fonseca, 1978).

#### **5.4. The civil service**

The Indian Constitution provides for the establishment of a Public Service Commission for the Union, and similar bodies for the State, for the recruitment of personnel to all civil services (Bhambhri, 1971). Civil servants in India hold office at the *pleasure* of the President of India. The Constitution provides security of service and length of service to all members of the services. They cannot be removed or dismissed by an authority subordinate to that by which they were appointed. Based on the level of responsibility, qualifications required, years of service and so on, the civil service is classified into: 1) Group A: Higher civil servants; 2) Group B: First-line supervisor; 3) Group C: Clerical Job; and 4) Group D: Messengers, peons. In 1980, out of every one hundred central government employees, 1.30 were in Group A, 2.20 in Group B, 54.79 in Group C, and the remaining 41.71 in Group D (Maheshwari, 1990). It is usual for civil service posts in India to be assigned to the different Services; the members of these Services are then assigned to one or other of the Offices. Individuals enter a Service, and move between the different Offices assigned to their services, taking up more senior posts as they get older. Each service offers a complete working career, once entry has been confirmed.

By and large the majority of civil servants are highly unsatisfied with their pay scales. For example, the joint consultative machinery (JCM), the union which represents 95 percent of the Central government employees rejected the new package announced by the fifth Pay Commission in July 1997, and called for an indefinite strike - pointing out that the package will benefit only the top echelons of bureaucracy (Times of India, July 19, 1997).

### **5.4.1. The Indian Administrative Service (IAS)**

With the transfer of power to the hands of Indians in 1947, the former Indian Civil Service, which had been staffed mainly by British officers, had to be replaced by a new all-India service - common to both Central and State Government with ultimate control vested in the centre. It should be noted that India, constitutionally entrenched the practice of central recruitment of all-India services. The officials were placed in charge of District administration and the top ranks of the administration of the State secretariats (Maheshwari, 1990). In the course of fifty years of independence, the Indian Administrative Service (IAS) has emerged as the elite corps who staff key positions close to the President and the Prime Minister as well as the other highest level positions. They are the elite of India's elite - the top strata of civil servants - numbering about 5000 - in effect rule the country of about one billion people. They are charged with co-ordinating cabinet policies and formulating administrative projects. Since they are generalists, they are found managing all sort of things; especially the central secretariat, the state secretariats, and district administration - are almost their exclusive preserve (Bhambhri, 1971). They are a significant factor in India's administration not only because they occupy all the key posts, but also because their strength is increasing in numbers.

At one time, the IAS used to be the exclusive preserve of India's most prominent families. However, these days, such elite is not so interested in the service. They prefer going abroad to earn advanced degrees or taking jobs with multinational companies (McGirk, 1997). The shunning of the IAS by India's brightest and snobbiest is beginning to change the fabric of the country's bureaucracy (McGirk, 1997). As fewer officers are drawn from the upper strata of Indian society, old timers say, the service has become increasingly politicised and increasingly dishonest. Officers, who are supposed to be close to the people, hang around Ministers and party bosses. Prime Minister Rajiv Gandhi highlighted the unconscionable leaks of development funds and drew attention to the fact that hardly 15 paise of every rupee spent reached the intended beneficiaries (100 paise = 1 Rupee). In fact, the lure of corruption begins right at the gates of the IAS academy. The list of new arrivals is keenly awaited by industrialists, high-ranking civil servants and government ministers. Bureaucracy represents power, and these people all want to seek an alliance with this power (Matthew, 1997).

The IAS is based on the assumptions that: 1) civil servants implement faithfully all policies and decisions of ministers even when they are contrary to the advice tendered by the service; 2) civil servants enjoy full freedom to express themselves frankly in tendering advice to their superiors including ministers; and 3) civil servants observe the principle of political neutrality, impartiality, and anonymity (Maheshwari, 1990). However, many IAS officers say that they are bending all the time before their political bosses. Since it is virtually impossible to sack an IAS officer, politicians often use the threat of transfer to bend administrators and even make them comply with unethical or downright illegal orders. On the other hand, how and why officials are transferred from one office to another have far-reaching consequences for the effectiveness of the public administration (Wade, 1984). Many writers point out that personnel transfers constrain the extent to which development departments push forward with their objectives.

The Lal Bahadur Shastri National Academy of Administration (LBSNAA) conducts training programmes for public officials in either central or state governments. Their major programmes are directed at the training of new entrants to a number of cadres, which staff the institutions of these governments. The Academy's courses convey a great deal of information, details of formal rules and regulations, legal statuses, and details of procedures (Mars, 1994). The academy has a distinguished and experienced faculty of over 40 members, drawn from the academic stream as well as from the different Services (LBSNAA, 1996). The academy's research units include the Centre for Co-operative and Rural Development, Centre for Sustainable Development, Centre for Micro-Planning and Regional Studies, Land Reforms Unit, and Village Study Unit.

The academy has a Training Unit of the National Informatics Centre with a well-equipped Computer Laboratory. There are over 200 computers on campus, all of which are linked through a fibre optic LAN. Connectivity to INTERNET has also been provided to all computers. Candidates are given a general, short-term, skill-based training on the use of computers, which make them aware of some of the capabilities of computers and that of some popular application packages. In addition to this initial IT training at LBSNAA, the IAS officers also have the opportunity to attend to some of the IS related training

programmes offered by the NIC, which the NIC claims to have been designed specially for IAS officers (Table 5.2)

Name of course	Duration (Days)
Introduction to Information Technology	5
Computer Applications in Government	5
Trends in Information Technology	5
Windows and Office Productive Tools	5
Working with Spreadsheet	3
Unix and Office Productivity Tools	5
Networking: Basic Concepts and Services	3
Informatics for Rural Development	3
Role of IT in Environmental Planning & Management	5
Commerce Informatics	2
Health and Family Welfare Informatics	3

**Table 5.2. IS related Training for IAS officers (Source: NIC Training Calendar, 1997)**

On the other hand, the other strata of civil services receive their training from different sources, depending on their grade, nature of appointment, and the State where they are posted. For example, the Sardar Patel Institute of Public Administration (SPIPA), Ahmedabad, was started in 1962 by the Government of Gujarat to provide pre-service training to newly recruited clerks of state government. Today, SPIPA provides both pre-service and in-service training programmes to a variety of government officials - on a variety of subjects such as General Administration, Rural Development, Decentralised Planning, Computer, Language, Management, Organisational Behaviour, Issues of National Importance and so on.

However, despite all such efforts, training has achieved only limited amount of success within the public administration in India (Khanna, 1968; Sanwal, 1988). As far as the upper strata are concerned, there is a divergence between the training needs of Government, and the actual training being provided (Sanwal, 1988). The lower strata of civil services are

handicapped for lack of adequate, suitable, and proper training (Khanna, 1988). This results in employees of the civil services who lack a thorough knowledge of their job, and how to do it with efficiency, ease and speed.

## **5.5. Administrative culture**

The study of public administration, in general, has tended toward domination by mechanistic and structuralist assumptions (Peters, 1991). Despite numerous critiques, structure remains the dominant explanation for performance and policy decisions in the public bureaucracy. This dependence upon structures is seen most clearly in the literature on administrative reform which argues -sometimes explicitly as well as implicitly - that if government could get their structures right, then they would function effectively and efficiently. However, the concern with structures does focus attention upon only a single component among the numerous factors shaping the complex reality of public administration. One of the factors that need to be understood is administrative culture (Sharma, 1990; Rao and Sofi Ali, 1991). An administrative culture can vaguely be defined as an ambiguous system of tentative beliefs, expressive symbols, subjective patterns of values and a constellation of cognitions that issue in administrative attitudes, bureaucratic behaviours and hierarchical relationships (Sharma, 1990). In operational sense, administrative culture represents an aggregate of traditions of organisations, which embody the spirit of its institution. Therefore, careful analysis of administrative culture can reveal a specific pattern of rational and irrational values, sentiments and attitudes, feelings and aspirations, which define situations in which administrative actions take place. Rao and Ali (1991) argue that administrative culture does not change easily. It compels people and their institutions to value certain things, influence their attitudes and prescribe their behavioural patterns. The authors go to suggest that a traditional and conservative society, like the Indian society, permit its culture to change only when the new attitudes and behaviour bring with them tangible benefits resulting in prosperity, human welfare and happiness.

Different studies on Indian public administration reveal strikingly distinctive features of this unique administrative culture (Wade, 1984; Jain, 1989; Malaviya, 1990; Shukla, 1991; Rao and Sofi Ali, 1992). They include: excessive self-importance - indifference towards the

feelings of individuals - slow-moving, holiday-oriented working pattern -unnecessary paper work - a mania for regulations and a rigid adherence to formal procedures - ready susceptibility to personal pressure and intervention - treating administration as a secret -no appreciation of the citizen's viewpoint - limited attention to service - a citizen is perceived as a 'subject' and not as sovereign - lubrication required in the form of payment: this is common in those areas of government activity involving a large number of transactions, for example, the issuance of drivers' licences, the settlement of minor criminal charges, the acquisition of seats or freight space on railway cars, to mention some of the most frequent encounters - preoccupation with activities or particular units of administration, and an inability to consider the government as a whole - exercises in public relations are aimed more at publicity and propaganda - inflexible personnel policies - uncertainty and variance in the application of rules and regulations - when confronted with a difficult decision, the Indian bureaucrat seldom makes any attempt to tackle the problem with initiative and imagination - a psychology of evasion wherever possible - using power for personal gain - militant unionism - political transfers - lack of a competitive spirit and inability to take risk, especially by the middle and lower level employees - excessively hierarchical management - absence of any sense of accountability among senior administrators - no mutual trust between government units or even employees within a particular department - barriers of communication between the higher and lower bureaucracy - twisting and bending to the political dictates to the minimum extent necessary while retaining many of its dysfunctional characteristics.

## **5.6. Decision-making**

Decision-making within the Indian public administration has always remained a controversial issue (Rangnekar, 1973). A good section of the clientele is not satisfied with the administrative decisions taken, and the time taken to make such decisions (Sahni & Vayunandan, 1992). People often feel that the decisions made in the administration are irrational and lopsided and protect the interest of one and not of others. For example, Majumdar (1987) points to a case where a routine matter like preparation of gradation list and confirmation of officials has taken six years in finalisation, while seven years was taken for reaching a decision with regard to a routine police inquiry into an incident of firing. Irrespective of the cause, it certainly affects the image of the administration.

A case study conducted to investigate the efficiency of the existing hierarchical structure in Indian public administration provides a clear picture of how a file travels through various levels (Majumdar, 1987). Findings of this case study reveal that the travelling of a file/case through various levels in hierarchy for a decision does not necessarily make the decision analysis richer. In fact, a decision taken at higher levels is practically a mere formal approval of the proposal suggested at lower level. Moreover, it is the lowest level that makes the highest, original contribution. What comes out to be more important is the fact that some of the routine matters may very well be disposed of at lower levels where officials are quite worthy of handling such cases while the top level officials should be kept free for dealing with more challenging and creative tasks. Unfortunately, the reality is that there is almost total absence of decisions at lower levels, where contribution is substantial. On the other hand, it helps develop among the middle and senior levels an attitude of over-dependence and averseness to take responsibility. The study confirms earlier findings that, in India, it is as important to learn ways of avoiding decisions as it is to learn ways of decision-making in America" (Rangnekar, 1973).

Many writers suggest that decision-making in the Indian public administration reveal that unusual delays in the decision-making process is caused by all kinds of checks that are prevailing in the system, controls, and blocks like audit, parliamentary and constitutional provisions including administrative laws, regulations, and so on (Banerjee, 1985; Mehta, 1989). Despite the above - which would seem to call desperately for simplification of procedures - the procedures continue to be long-winded and cumbersome. One direct outcome of it is that the administration often asks for large masses of data and information which bear little relevance to the issue at hand, and there is neither the means nor the machinery to process or use these data in decision-making. Moreover, the present system does not promote an informal relationship of mutual trust between superiors and subordinates, which alone could pave the way for faster decision-making. In fact, the present system promotes the opposite (Mehta, 1989).

### **5.6.1. Decision-making and information systems**

The first significant initiative for introducing computer-based information systems within the public administration came from Rajiv Gandhi in 1984 (Singhal and Rogers, 1989). He believed that the Indian public administrative system should be persuaded to transact most of its business through computers. Emphasis was placed on government departments to adopt computers to streamline their work procedures and to enhance their information-processing capabilities. Accordingly, one of the major features of technology policy in the mid-1980s was to actively promote computer applications which had a perceived catalytic effect on development (GOI, 1985). The National Informatics Centre was brought into the picture to play a promotional role in creating computer awareness and for developing and implementing computer-based information systems for decision support in public administration. To this end, the Planning Commission took account of the allocation requirements and the general targets for the plan period. Special expert committees were then established to examine specific areas and to make recommendations for computer applications (Madon, 1994). The NIC then provided the hardware, software, design, development and maintenance at the central, state and district levels.

To this end, there is no doubt that the NIC has developed some innovative systems for different sectors such as rural development, natural resource management, district administration, public information and so on. There is also no doubt that some of these systems have improved the availability of information at central agencies, though the accuracy and completeness remains a controversial issue (Hanna, 1994). Furthermore, some major issues, such as the overall appropriateness of these systems in a particular context, their effectiveness and efficiency, their relevance to a particular need, and so on are highly debatable. Looking at few examples such as Computerised Rural Information Systems Project (CRISP), District Information Systems Programme (DISNIC), and Geographic Information Systems (GISNIC) might be useful (Annex 5.3).

However, today, despite all such setbacks, more and more Government Ministries and related Departments are undertaking a variety of computerisation projects, which range from simple word processing systems to complex on-line wide area networks integrating micro-



level data originating in the field offices with the headquarters. While Annex 5.1 presents some of the important computer-based information systems implemented by the National Informatics Centre in major sectors of the Central Government such as Agriculture, Administration, Energy, Finance and Commerce, Science and Technology, Social sector and so on, Annex 5.2 presents some of the important computer-based information systems in major sectors of State Governments (NIC Service Profile, 1994). Overall, in the past ten years, there has been considerable growth of computer applications within the Indian public administration. To this end, today, the public sector accounts for approximately two-thirds of the market for computer systems (Hanna, 1995). However, only few of the above applications reach the policy-making level (Banerjee, 1995). In keeping with the general trend, most applications are at operational level concerned with day-to-day data and only seldom their outputs are tuned to meet the needs of the corporate decision-making. On the other hand, earlier studies on both public administration in general, and that of specific to India reveal that the development of computer-based information systems to modernise public bureaucracies in many developing countries cannot succeed, unless such projects are incorporated in programs of far-reaching reforms (Avgerou, 1990; Madon, 1991).

### **5.6.2. The National Informatics Centre (NIC)**

Any discussion about computer-based information systems in the context of the public administration in India is not complete without some form of discussion about the National Informatics Center (NIC). At the same time, trying to increase our understanding about the NIC means getting to know Dr Seshagiri, the Director General of NIC whose name today has become synonymous with the NIC. Dr Seshagiri holds a Ph.D. in Electrical Engineering from the Indian Institute of Science, Bangalore. Be it the Tata Institute of Fundamental Research (TIFR) or the Department of Electronics or the Planning Commission, all the institutions he has been associated with bear a touch of his personality. It was he who helped in networking all the stadia of the Asiad and designed the total system to such perfection that for the next Olympics at Los Angeles, his Department was approached by the Olympics Committee to help out (Gautam, 1996). Not surprising, for he was the person who gave India her first policy on computers, and was the first to implement the national computer policy and also the first VSAT

networks in the nation.

A close associate of Indira Gandhi and, after her, Rajiv Gandhi, Dr Seshagiri believes that IT can become India's key competitive advantage, and that India can be the best. From the very start, he began to analyse the benefits of computerisation to the country and started propagating such ideas to political leaders. Once, he was asked by Mrs Gandhi to teach her son Rajiv Gandhi computing, and that set the ball rolling. As a one-man operation, with his vision, and the support from the highest level, he took the opportunity to think ahead of his time, and has today managed to set up an organisation of information sharing and planning that the world knows as the NIC. He has also executed major plans and projects for the automation in the Government departments. He likes to call the work he does at NIC as "effective optimisation of resources" and declares his aim as to get computerisation in the country at all levels without the hindrance of outrageous policies. The greatest example of his vision is the New Computer Policy (NCP) which he formulated and launched in 1984. None would deny the immense weight this policy has had on the course of computerisation in India, both in the public and private sectors.

It is in this background that the NIC was set up in March 1975 by the Government of India - to play a promotional role in creating computer awareness and for developing and implementing computer based information systems in the Ministries and Departments of the Central Government. It was functioning as a separate wing at the beginning under the Department of Electronics (DoE), primarily developing software for Government Departments to handle information. Later on, it was brought under the Ministry of Planning and Program Implementation, which encompasses the Planning Commission and the Department of Statistics - the NIC forms a part of the Planning Commission. NIC has come a long way since its earlier days. It has grown in all directions, and during this process has also become more complex. Today, the NIC has its Headquarters in Delhi; Regional Centres at Pune, Bhubaneshwar and Hyderabad; State Units in all the State Capitals and Union Territory Headquarters; and Offices in over 440 Districts of the country. Presently, its services are available to the Government of India, all the State Governments, Union Territory Administrations and to the District Administrations throughout the country. The services provided by the NIC include development of application software packages, systems

software, database systems, distributed databases, networking, electronic mail, computer-aided design, geographic information systems, expert systems, office automation and training.

In order to achieve its aim, the NIC has established Informatics Technology (IT) Units in every Ministry and Department of the Government of India. In fact, it is a deliberate policy today to keep NIC Units in every State Headquarters and Ministries. A number of IT units comprise an Informatics Division. The division is responsible for interacting with the users, studying their information requirements and arranging for the necessary hardware and software for the MIS support within the Ministry/Department. While the IT Units interact with the end users and ensure the smooth operation of the equipment and application software, as well as connectivity to NICNET, the division also catalyses projects which can integrate information from the field offices for timely and effective decision making. The latter are implemented by NIC on turnkey basis. These commercial projects are executed by NIC at no profit (cost plus).

Approximately, one third of NIC's personnel are located in NIC Headquarters where a number of Application Divisions have been created to provide informatics support to the Ministries and Departments of the Central Government. All these divisions are headed by officers at various levels and comprise technical officers and staff at the level of Principal Systems Analysts, Senior Systems Analysts, Systems Analysts, Programmers and Programmer Assistants. The Division Head, usually the Senior Technical Director, reports to the Director General of NIC. In addition, there is a large number of support groups at NIC headquarters such as the Network communication group, The systems group, Artificial Intelligence Unit and so on which provide the required informatics infrastructural backbone for helping the Applications Divisions deliver services to the users.

NIC-State Co-ordination Committees (NSCC) under the chairmanship of respective Chief Secretaries, have been set up in all the states, with NIC State Informatics Officer (SIO) as the convenor. NSCCs review the informatics development at the state level. The SIOs also help in the proper implementation of centrally initiated computerisation projects at the state level. Each District has a Systems Analyst/Programmer as the District Informatics Officer (DIO)

who is assisted by a District Informatics Assistant (DIA). They account for nearly one third of the NIC staff. The remaining one third is distributed in the Regional Centres and the State offices throughout the country.

NIC presently has a strength of over 3000 persons with 80% of them being technical personnel - primarily with a computer science or mathematics background. The suitable candidate who is joining the NIC today as a Programmer Assistant climbs a tall ladder during his career as Programmer ---> Systems Analyst ---> Senior Systems Analyst ---> Principal Systems Analyst ---> Technical Director ---> Senior Technical Director. Presently, there are only five Deputy Director Generals above the rank of Senior Technical Directors. They report to the Director General who in turn report direct to the Minister.

Staffs of NIC are usually promoted every three years. They are promoted not because of any vacancies in higher grades, but due to the number of years they have served in a particular grade. Basically, they get a promotion and stay in their original places - of course with increased pay. Their promotions are usually based on the number, and type of projects they have undertaken or completed during their term.

NIC Training Centres are located at NIC headquarters, at the three Regional Centres, and at all State Centres. NIC claims that this large spread of the training centres enables them to reach all levels of officials at places nearest to their place of work. Training encompasses all kinds of courses for various levels of officials from awareness creation of senior officials, to routine programming and operational training of the staff at the working level. The Training Division of NIC keeps pace with latest technological changes and conducts state-of-the-art technology-based programmes to upgrade knowledge/skills of in-house staff.

NIC has set up a satellite-based nation-wide computer-communication network, called NICNET, with over 650 nodes connecting the national capital, the state capitals and district head quarters to one and another. It has also designed and developed the General Information Service Terminal (GISTNIC) to provide information of interest to users throughout the country, over NICNET. This large database has information on a variety of subjects, and is claimed by the NIC as the only such database in Asia. In addition, NIC has

also implemented many other systems such as DISNIC (District Planning Information System), GISNIC (Geographic Information System) and so on (NIC Service Profile, 1994).

Today, NIC claims that as a result of its efforts, more and more Ministries and Departments are undertaking large computerisation projects for integrating micro-level data, originating in their field offices, with the headquarters. This facilitates decision making and policy formulation. In addition to its principal role, the NIC also claims that it is demolishing barriers on information dissemination, and in making of the Government more transparent to the public, as well as in making information more readily available from one Department to another, from the State Government to the Central Government and vice versa.

However, on the other hand, the role of the NIC is very ambiguous at present. It is not a statutory body, and its presence is not recognised by the Constitution. Even the latest Gazette notification by the President of India concerning its role has failed to spell out this issue in more clearly terms (The Gazette of India, September 1995). Today, funds required by different Ministries and Departments for computerisation are allocated based on targets set by the Planning Commission. While the user organisations pay for the hardware and software, NIC provides the expertise in terms of their staff. The services of NIC for projects, which are exclusively of the nature of management information systems for Ministries/Departments, are provided at no cost.

## **5.7. Summary**

The aim of describing different dimensions of India's public administration in this chapter is to understand and interpret the activities of different organisational members associated with the application of information systems within the public administration - against these micro contextual elements. To this end, it can be noted that:

- The public administration has expanded spectacularly in all directions, and has become vastly more complex.
- Control oriented regulatory system of administration inherited from British colonial days has little value for development administration.

- Barring very few exceptions, not many areas have benefited through administrative reforms.
- It is but natural that in a society which always had a stratified social system, bureaucratic organisations also tend to acquire a caste-like structure.
- The civil service of the country has become politicised over a period of time. Both the civil servant and the politician have learned to accommodate each other in a wide variety of matters.
- It appears that the values set by the British continue to guide the bureaucracy even after independence, and there is no radical departure in their behaviour from pre-independence norms.
- The system appears to be heavily inclined towards routine administrative tasks, and the concentration of authority suggests strong power orientation, unsuitable for the achievement of development goals.
- Though senior bureaucrats are aware of such shortcomings, and they see the need for participatory development programmes but in actual practice have done very little to implement such policies.
- The application of computer-based information systems within the public administration has achieved very little success.
- The role of the NIC is very ambiguous at present.

## ANNEX 5.1

### CENTRAL GOVERNMENT INFORMATICS

\* **Agriculture:** Agriculture Census, Agricultural Input Survey, Agriculture Commodity Prices Movement, Agriculture Commodity Market Arrival Monitoring, Crop Statistics, Seed Management; Fertiliser Production, Movement, Import and Consumption; Irrigation Water deliveries etc. for use by State Irrigation Departments; Monitoring of Reservoir Levels through NICNET; Land Records System; Management of Food Economy - Procurement of Wheat and Rice System; Storage and Stock Position of Food grains, Sugar Informatics System, Public Distribution System, Price Monitoring of Grains, and Wagon movement by grains.

\* **Administration:** Personnel database for Postings, Transfer, Training; Vigilance cases; Infrastructure Monitoring: Production performance of 9 Key Sectors, namely Power, Coal, Steel, Railways, Shipping, Telecom, Fertiliser, Cement, Petroleum and Natural Gas; Industrial Disputes Pendency monitoring, Industrial Unrest monitoring, Emigrants Complaint Monitoring, Recruiting Agents Monitoring; Result Processing for Hindi Examination under Official Language Teaching Scheme.

\* Similar applications have been developed for the following sectors too:

\* **Energy**

\* **Finance and Commerce**

\* **Social sector**

\* **Science and Technology**

Apex Organisations like Cabinet Secretariat, Prime Minister's Office, President's Secretariat, Vice-President's Secretariat and the Parliament including the Lok Sabha and the Rajya Sabha have been computerised for their specific requirements.

## ANNEX 5.2

### STATE GOVERNMENT INFORMATICS

Commercial and Road Transport Tax  
Municipal Property tax  
Personnel management  
Accounts Consolidation  
Financial Accounting of District Co-operative Banks  
State Government Insurance  
Social Welfare for Disabled Persons  
Household Survey Data  
Coir Industry Survey Data  
Health Institutions Data  
Central Medical Store Inventory  
Small Scale savings Schemes  
Rainfall Data  
Old Age Pension Disbursement  
Public Grievances Redressal  
Government Employees Census  
Chief Minister's MIS  
Governor's Office Management  
Budget Processing with Output in Local Language



### **ANNEX 5.3**

- **Computerised Rural Information Systems Project (CRISP)**
  - **District Information Systems Programme (DISNIC)**
  - **Geographic Information Systems(GISNIC)**

#### **Computerised Rural Information Systems Project (CRISP)**

One of the large information systems developed by the NIC for the public administration to accelerate socio-economic development is the Computerised Rural Information Systems Project (CRISP) (Box 5.1).

### **Box 5.1: Introducing Computerised Information Systems To Improve Integrated Rural Development Program Management**

In the mid-1980s, the government of India realised that a massive amount of data had been collected for managing the Integrated Rural Development Program (IRDP) but that not much of it had been used effectively for micro-level planning and implementation at the district level or for policy making and monitoring at the state and central governments. A pilot experiment at the Karwar District that introduced computerised decision support systems resulted in a marked increase in the district's performance, by improving efficiency of report generation, enabling officers to devote more time for vital extension duties, and improving access to accurate and timely data for decision making and monitoring. Based on this experiment, CRISP was extended to the whole country in 1987.

Experience of implementing CRISP has shown that:

Organisational and human factors play a critical role in the effective deployment of information technology in developing countries. On the one hand, the complex socio-political and cultural context of development administration has resulted in such systems being used as a means of increasingly centralised dominance and control. On the other hand, computerised information systems have been used as an enabling mechanism for the development of decentralised localities to carry out planning and implementation of projects. The parallel existence of both opportunities and threats in the application of information technology for development planning suggests that the process of change needs sensitive management, which should take into account the complex web of socio-political and cultural factors in development administration.

Experience of implementing CRISP in terms of human resources suggest that:

At the state level, issues of education and training are of key importance. Policy should outline the means of improving the education and training facilities to combat scarcity of skilled personnel at district level. The trend towards local initiative at district level requires that training should be directed not only towards operation of the computer, but also towards local management of the technology.

**Source: S. Madon, Public Administration and Development, Vol.13, 37-48 (1993)**

### **District Information System Programme (DISNIC)**

The DISNIC was launched by the NIC in 1987 with a view to serve the needs of the administrators (centre, state and district) in a co-ordinated and uniform manner, and to facilitate decentralised planning. According to the NIC, the main objectives of DISNIC are to: 1) develop the necessary information/databases in various sectors of the economy for planning and decision making at the district level; 2) promote Informatics culture at the district level; 3) improve the analysis capacity and the presentation of the statistics utilised for national, regional, and district planning; and 4) develop modelling and forecasting techniques that are required for decision-making for socio-economic development (DISNIC Highlights, 1994). District Informatics Centres were established to capture data at the source. State Informatics Centres supported these district centres, which were originally established to support state government departments. DISNIC facilitates collection, compilation, dissemination and on-line accessibility of information on 27 sectors of the economy at state level, with the availability of information at all possible levels like district, Taluk, Block, Panchayat, and village. This means that information required for planning and decision-making can flow from districts to states and then to central government departments. Today, the DISNIC programme is operational in 440 districts throughout the country. The NIC claims that many states have taken up the implementation of this programme on priority basis, and have used it successfully in some of the major sectors like Industry, Agriculture, Education, and Transport.

On the other hand, the DISNIC programme is claimed to be political because it evoked the sensitive issue of centre-state relationships - which resulted in certain states reacting negatively (Madon, 1994). Moreover, DISNIC did fail to take account of different administrative set ups and information needs - which resulted in non-use or suboptimal use of DISNIC package (Pradhan, 1990).

## **Geographic Information System (GISNIC)**

Aware of those potential benefits of applying geographic information systems (GIS) for promoting socio-economic development, the NIC embarked on an ambitious project, known as GISNIC (Box 5.2).

### **Box 5.2. GIS for District-Level Administration in India: Problems and Opportunities**

This paper describes a research study, carried out over the period 1993-95, of the efforts made in India to develop and use GIS to aid district-level administration. The NIC had installed a version of GISNIC designed and developed by their own staff, in about 40 districts at the time of the research described here, and they planned in the end for all districts to have the technology, linked across the whole country by NICNET. The GISNIC aims to contain a variety of district-level data, overlaid on base maps produced and distributed through the network.

Experience of implementing GISNIC has shown that:

Nothing substantial had occurred in terms of actual application. The emphasis of the NIC was almost solely on technical development, with no significant attempt at enrolling local level administrators. It can be suggested that the NIC were a long way away from providing GIS which might prove useful in the actual work at the district level.

Experience of implementing GISNIC in terms of human resources suggest that:

Strategies for human resource development will need to be tailored towards the awareness and capability of local administrators as well as towards the state of maturity of GIS usage in the district. While senior level district officials require conceptual knowledge about GIS, people at lower levels require operational knowledge about GIS.

**Source: Walsham and Sahay (1996) and Madon and Sahay (1997)**

## **CHAPTER SIX**

### **Case Study: The Social Welfare Scheme**

The case study described in this chapter concerns the introduction of a computer-based information system to administer a social welfare scheme in the State of Tamil Nadu, which is one of the largest and most prosperous States in India. The welfare scheme was first introduced by the State Government of Tamil Nadu in the year 1962 when Kamraj was the Chief Minister of Tamil Nadu. A close companion of Jawaharlal Nehru and a respectable politician, Kamraj's genuine concern for the poor is unanimously recognised even today in Tamil Nadu. At the time of introduction, the welfare scheme was considered as one of the most important and popular schemes ever introduced by any State Governments in India. This particular scheme gained so much popularity, that immediately after its introduction, similar schemes followed in many of the Southern States. Today, almost all Southern States have similar welfare schemes in operation. Since its introduction, for almost thirty years, the administration of the welfare scheme was carried out as a manual, paper-based system. This chapter describes the administration of this scheme in the District of Chennai, which is the capital of the State of Tamil Nadu, before and after the introduction of a computer-based information system. The chapter starts with briefly discussing the sequence of events that led to the introduction and operation of the computer system, and then continues to present some of the views expressed by different organisational members associated with its application.

#### **6.1. The social welfare scheme**

The State of Tamil Nadu is situated on the south-eastern side of the Indian Peninsula. It is the eleventh largest state in India, and occupies four per cent of the country's total area. Tamil Nadu has a very ancient history that goes back some 6000 years. The state represents the nucleus of Dravidian culture in India. Though agriculture is the mainstay of Tamil Nadu's economy, industrial complexes called growth centres, and industrial estates have been established in different parts of the state. Tamil Nadu accounts for nearly one fourth of the spinning capacity in India, one fifth of cement, caustic soda and nitrogenous fertilisers and one tenth of the nation's production of sugar, bicycles and calcium carbide. Tamil Nadu

produces 60% of safety matches and 70% of finished leather. Industrialisation made great strides in Tamil Nadu in the early sixties, and urbanisation has been accompanying it. This, coupled with modernisation, high standards of education, and contacts with other parts of the world have contributed substantially to Tamil Nadu's socio-economic performance (Manorama, 1997). The capital of Tamil Nadu is Chennai, which is also one among its twenty-nine districts. Chennai is a thickly populated Metropolitan city. It is 174 sq.km in area and has a population of 3,841,400. Chennai is divided into five taluks for administrative purposes. They are 1) Fort-Tondiarpet Taluk; 2) Mylapore-Triplicane Taluk; 3) Perambur-Purasawakam Taluk; 4) Mambalam-Guindy Taluk; and 5) Egmore-Nungambakam Taluk.

The Social Welfare Scheme was introduced by the State Government of Tamil Nadu in 1962 with a view to help the poor and destitute old aged people. Under this scheme a monthly pension is provided by the state to the downtrodden and destitute who have no source of income, and living below povertyline. The scheme covered the following category of people: a) old destitute persons; b) widows; c) physically handicapped; and d) deserted wives. The amount of money paid under each category of pension, conditions that qualify a person to draw a particular category of pension, and so on are presented in Table 7.1.

Special Tahsildars were appointed by the State Government of Tamil Nadu in every taluk to implement the welfare scheme under the programme called Distress Relief Scheme (DRS). Their responsibility involved sanctioning new pensions, cancellation of pensions of deceased pensioners, maintenance of records, preparation of reports, and monitoring the disbursement of pensions every month. Four clerical assistants were also provided to every DRS Tahsildar that to help them carry out their responsibilities. The State Government entrusted the overall responsibility of implementing this scheme with the District Collectorate office in every district. Funds for the Welfare Scheme was allocated on an annual basis by the State Government. Every District and in turn every Taluk was given a fixed limit on the number of pensions to be sent every month. This limit is called the Sanctioned Strength. The sanctioned strength is fixed by the State Government and is reviewed periodically. The DRS Tahsildar is given the authority to only sanction pensions up to the limit of the sanctioned strength.

Name	Conditions	Amount paid
Old Age Pension	<ul style="list-style-type: none"> <li>* should be more than 60 years;</li> <li>* should have no income or as source of income;</li> <li>* should not have any properties;</li> <li>* should not be a beggar; and</li> <li>* Should not have any son.</li> </ul>	US\$ 4.00 (Rs 100.00)
Widow Pension	<ul style="list-style-type: none"> <li>* no age limit;</li> <li>* should not be remarried;</li> <li>* destitute without no source of income; and</li> <li>* If they have a son, pension is provided until the son attains 18 years of age.</li> </ul>	US \$ 3.00 (Rs 75.00)
Physically Handicapped Pension	<ul style="list-style-type: none"> <li>* should be more than 45 years - should produce Doctor's certificate for the age;</li> <li>* should be a destitute;</li> <li>* physical incapacity should be more than 70%;</li> <li>* Physically handicapped persons who are below the age limit of 45 years but satisfies the conditions under this scheme can be sanctioned pension by the committee constituted by the Collector, consisting Professor of Medicine Government hospital and District Social Welfare officers as members.</li> </ul>	Us \$ 4.00 (Rs 100.00)
Deserted Wife Pension	<ul style="list-style-type: none"> <li>* applicant should be more than 30 years of age;</li> <li>* the period of separation from their husbands should be more than 5 years;</li> <li>* should be destitute with no source of income;</li> <li>* should have no properties; and</li> <li>* If they have any son, pension is payable until the boy attains 18 years of age.</li> </ul>	US \$ 3.00 (Rs 75.00)

**Table 6.1. The Social Welfare Scheme**

Thus, only when a vacancy arises, a new applicant will be included in the Pensioner List. Till then, the eligible applicant would be kept in a Waiting List. Vacancies may arise due to the

demise of an existing pensioner or due to an increase in the sanctioned strength. Before the 10th of every month, money orders are sent to pensioners for the previous month. Every month the DRS Tahsildar submit a report to the Collector on beneficiaries and expenditure.

## **6.2. The manual system**

The social welfare scheme was administered using a manual, paper-based system for almost thirty years since its introduction in the year 1962, serving about 45,000 beneficiaries. Administrative procedures and Records/Books associated with the manual system are summarised below:

- Applications for new pensions were usually received at the Taluk Office. Some applicants submitted their applications directly to the District Collector, MLA, or even to Ministers. These applications were then forwarded to respective Taluks for processing.
- Details of each application were entered in the Pension Application Register.
- These applications were then forwarded to respective Revenue Inspectors in each Taluk for verifying the facts provided by the applicant. The Revenue Inspectors are expected to verify the facts given by the applicant and submit a report to the Tahsildar along with the application.
- Eligible applicants were added to the Waiting List. Rejected applicants were informed.
- Sanction Orders were issued whenever there were vacancies. As pointed out earlier, vacancies may arise due to the demise of existing pensioners or due to an increase in the sanction strength. A Sanction Order is a letter from the DRS Tahsildar to the pensioner stating the month from which he/she would be paid pension.
- Details of applicants who have been issued with Sanction Orders were entered in the Pensioner Register.
- A list was generated every month from the Pensioner Register indicating the amount, and the names of pensioners to be paid.
- The list was sent to the Pay and Accounts Office allocated to each District.
- A cheque was drawn in favour of the postmaster by the Pay and Accounts Office.
- Money Orders for every pensioner were written manually in the Taluk Office and handed over to the postmaster along with the cheque.



- Money was delivered to the pensioners by the Post Office at their doorstep.
- In case of the death of a pensioner, the money order sent to that pensioner was returned. Details of the returned money order were entered in a register called Security Register. A statement on returned money orders was prepared and the returned amount was paid back to the treasury.
- Pensions for subsequent months were cancelled and necessary entries were made in the Pensioner Register. Vacant position was filled by drawing on the waiting list.
- Every month a report is sent to the Collector by the Taluk Office on beneficiaries and expenditure.

It should be noted in this context that the above administrative procedures and associated Records/Books were designed by the Social Welfare Wing at the Secretariat. They had to be strictly adhered to.

### **6.2.1. Problems faced with the manual system**

A number of problems were encountered by both administrators and beneficiaries when the manual system was in operation. For example, about 45,000 Money orders had to be written manually every month. This caused unusual delays in their despatch. The delay was mainly due to the sheer number, apart from factors such as shortage of staff, chronic absenteeism at the taluk office and so on. When pensions were not despatched in time, or when a particular month's pension failed to reach a particular pensioner in time, the pensioner(s) made petition to Ministers, MLAs, or even went personally to meet the Collector. In such circumstances, the Collector was unable to find out the exact cause of the discrepancy mainly because the taluk office and the Collector's office were situated at different places. Furthermore, when an application was made for a particular type of pension, the applicant did not hear anything until he/she receive a Sanction Order or rejected application. This can take several months or even years. Under such circumstances, the applicant either made fresh application(s), or made complaints, or even both. This caused numerous problems both in the Taluk office as well as in the Collector's office. At the same time, when Ministers and/or MLAs raise these issues in the Legislative Assembly, these issues were redirected to respective Collectors for clarification. Furthermore, the State Government itself requested information from time to

time from the Collector's office regarding the welfare scheme. Under such circumstances, obtaining sufficient information was very difficult. Overall, the welfare scheme continued to generate more and more problems and this caused much inconvenience to both administrators and beneficiaries.

### **6.3. A way forward**

The District Collector of Chennai who assumed duties in the year 1992 decided to make a proposal to computerise the welfare scheme. The proposal was presented by the Collector in the NIC-State Co-ordination Committee meeting in April 1992. The NIC in turn agreed to computerise the Social Welfare Scheme in the District of Chennai as a pilot project. The State Informatics Officer (SIO) of Tamil Nadu delegated the task of designing and implementing the information system to the District Informatics Officer (DIO) of Chennai.

The DIO started the project by looking at all the work carried out at the Tahsildar's office, from the time of receiving an application to that of despatching pensions. Samples of documents were collected, long interviews were held with concerned staff, and work procedures were observed. The workflow and administrative procedures were documented using flow charts and structure charts. They were cross-checked with concerned staff at the Taluk office. The DIO presented his analytical findings to the SIO. The SIO decided at this point to keep the initial processing of applications outside the system boundary - i.e., the initial processing of applications to be continued as a manual system, and the new system is to carry out functions only from the time a Sanction order is issued. These issues were discussed with the Collector and the collector practically approved the proposed system. She also briefly defined some her information requirements at this stage.

The new information system was to be installed and operated within the Information Technology Unit of the NIC, located in the District Collector's office. It was designed as a database system to operate in a XENIX environment, on a hardware platform consisting Intel based PC 386. The application software used was FoxBASE, a relational database management system. The hardware and software platforms were already there within the Information Technology Unit. Data models were created according to the flow charts and

work procedures. Program modules were written wherever necessary. A menu-driven user interface was designed. The database contains the following Tables :

- **Pensioner Table:** contains details of individual pensioners.
- **Taluk Table:** holds details of each Taluk.
- **Deletion Table:** When a record is deleted from the Pensioner Database it is transferred to the Deletion Table.
- **Pension Table:** The Pension Table contains details about each type of Pension.
- **Money OrderTable:** Holds details of despatched Money Orders

The system was tested first using the DIO's own test data. It was working satisfactorily after minor modifications. No special training sessions were conducted. Staffs from the Taluk office were called to the District Collector's office for data conversion, which in turn was treated as training sessions. The Revenue Minister of Tamil Nadu, as planned, inaugurated the new computerised system on the 18th of September 1992.

#### **6. 4. Features and operation**

Today, the new computerised system, which is installed in the Office of the NIC, located in the Madras District Collector's Office, operates in the following manner:

Specific staffs from each Taluk come to the Office of the NIC every month on particular days allocated to them. Every Taluk is provided with a password that to access the database containing details about 45,000 pensioners. Addition of new pensioners and deletion of deceased pensioners are carried out by the respective taluk office staff. Respective staffs bring the - necessary information required for the update.

Once the database is updated with additions and deletions, five copies of the updated list providing names and account numbers of 150 pensioners in each page are printed. This list is used mainly to claim the cheque from the Pay and Accounts office. One copy is sent to the Pay & Accounts office, three copies are given to the Post office and one copy is kept in the office. The district Collectorate provides the computer stationary required for printing this

list of pensioners.

One of the major problems that administrators faced when the manual system was in operation was the writing of 45,000 money orders every month. This required considerable amount of time and labour. In the new system, the Money Orders are printed using pre-printed continuous stationary, replicating an ordinary Money Order form. Special Permission has been obtained from Chief Post Master General, Tamil Nadu Circle to introduce this pre-printed Money Order form. The money orders are printed using the Line Printer available at the office of the NIC, Secretariat. The time taken for printing 1000 Money Orders using a 600-LPM Line Printer is 30 minutes. So it requires 15 to 20 hours to complete the entire 45,000 money orders. In the manual system, it took around seven to ten days to complete this task. The Money Orders are printed postal zone wise thereby reducing the sorting work involved. The present system also provides the facility to maintain information on Returned Money Orders and acknowledgements received. For any given month and year, the information pertaining to Money Orders sent, Money Orders acknowledged and Returned Money Orders can be obtained instantaneously. In addition, reports about the number of beneficiaries either Taluk wise or scheme wise, and figures regarding Sanctioned Strength, Operative Strength and Vacancy Position are also provided. Furthermore, an on-line query system has also been provided to the Collector to facilitate information retrieval.

## **6.5. Organisational members**

The application of computers to administer the Welfare Scheme involves the activities of a number of organisational members. This section briefly looks at their educational/training background first, and then presents some of their views regarding the development and operation of the new computer-based information system. Since the main objectives of the new information system can be suggested to be to provide improved quality of service to pensioners and appropriate information to the Collector, the views of these members are presented first and then that of the others.

### 6.5.1. The Collector

The district Collector of Chennai has played an important role during and after the introduction of computers to the Welfare Scheme. In addition to proposing the project for computerisation, the Collector has also defined her information requirements during the stage of systems design. Today, the Collector uses the outputs of the system for administrative purposes. The Collector is an IAS officer. It can be suggested that her administrative related education/training, combined with her experience as a collector, make her well aware of India's socio-cultural, political and economic dimensions. In addition to her initial academic education/training, the Collector has also completed a number of short-term information systems related training programmes offered by the NIC for IAS officers. These programmes, as already discussed, primarily concentrate on the use of application packages within different administrative domains of the public administration. Some of her views about the new information system are presented below:

When asked to comment about the new information system, the first remark of the Collector was:

*“ ... the present system is a nuisance... I do not think that it has done anything useful ..it has neither helped me nor achieved anything...in fact, it has created more problems for me... pensions for the last two months have not been despatched ...now they say it is due to a shortage of pre-printed stationary.... my office has to answer to all sort of questions relating to this delay.... ”*

The Collector admitted that the system has no doubt speeded up the process to a certain extent. However, she thinks that it should not be the ultimate aim. She pointed out:

*“... I understand that there are about 10,000 pensioners in the waiting list in one particular Taluk... 30,000 applications waiting to be processed in the same Taluk... and yet I don't know how many eligible applicants still have not applied - the new system does not tell anything about these... don't agree with the business of automating any of our activities and that it should not be our aim too....there are too many people in India to whom we can and should provide employment...the public sector is there to serve the people... its motive*

*is not profit making like the private sector... the aim of computerisation should be to inform the higher-ups rather than automating lower level activities.....most of the people around me assume today that the welfare scheme should now be running very smoothly because it is computerised... ”*

The Collector pointed out:

*“... Chennai is a thickly populated Metropolitan city, and therefore, problems associated with the Welfare Scheme are numerous... the problems we were facing when the manual system was in operation were enormous....the number of applications for pension was increasing... but we were unable to process them in time...we could not despatch pensions in time... obtaining necessary information was very difficult - for that matter, obtaining any meaningful information was not possible... but, the poor should not suffer because of our administrative inefficiencies.... ”.*

The Collector expressed dissatisfaction about the performance of the NIC on a number of occasions. For example, she pointed out:

*“the NIC was not very helpful at the beginning... the present system has too many unimportant and unnecessary features... ”.*

The Collector is of the opinion that the NIC should ensure the smooth operation of the system continuously. Above all, it appeared that she is not very happy about the very presence of the information technology unit of the NIC in her Office.

The Collector did not want to discuss anything in detail about keeping the initial processing of applications outside the system boundary. She implicitly blamed the NIC for not coming out with an appropriate solution. For example, she suggested:

*“... they are the experts...they should suggest different alternatives....but, they are always busy building new systems ... they do not have time to improve the present system...”*

When asked about the nature of her job, the Collector remarked:

*“...my stay in Chennai as the district Collector is only for a short period – the government's priorities should be addressed without delay...”.*

On several occasions, the Collector implicitly suggested that rational decision-making is not always possible in today's context. She did not want to go further into this subject.

### **6.5.2. Pensioners**

Informal discussions with a number of pensioners revealed that:

Pensions were always late, and paid at irregular intervals when the manual system was in operation. However, since the introduction of computers, most of the time pensioners are receiving their pensions in time and at regular intervals. One pensioner remarked:

*“...things are definitely better after the introduction of computers...”.*

Some pensioners even complained that they had to pay Rs 50.00 to the Revenue Inspector at the beginning to process their application in time. Repeated complaints were made by a number of pensioners and their colleagues about the irregularities taking place at the Tahsildar's office in relation to the welfare scheme - Queue-jumping, bribery, favouritism and so on. There are a number of cases where new applicants have started to draw their pensions while those in the waiting list are still waiting. For example, one pensioner said:

*“...those who have good connections always get their things done in time...”.*

Although the Welfare Scheme is computerised at present, it appears that there are no radical changes in the way complaints of pensioners are dealt with. They are still sent from pillar to post.

### **6.5.3. The state informatics officer**

The SIO holds a Master degree in computer science. He has also completed a number of

short-term training programmes offered by the NIC that were primarily technological in nature. He has been working in the State of Tamil Nadu for almost fifteen years as the State Informatics Officer. During this period, he has played an active role in a number of important projects that were undertaken by the NIC in the State of Tamil Nadu. Although the SIO was not associated with the introduction of the new information system in an explicit manner, he has played a critical role implicitly on many occasions. For example, the decision to computerise the Welfare Scheme as a pilot project in the district Chennai was taken by the SIO. Furthermore, the decision to leave the initial processing of applications outside the system boundary was also taken by the SIO. Some of his views about the new information system are summarised below:

When asked to comment about the new information system, the first remark of the SIO was:

*“ ... these IAS officers think that they are the saviours of India - they pretend to know everything....sometimes they just pretend to be busy.. just to show that they are big people... they do not know much about computers... the training given to them on the use of computers is very basic and many of them do not even turn up to the classes anyway... with my experience, every IAS officer is interested only in initiating new projects... they are not interested in completing projects that have already been initiated by their predecessors... ”.*

The SIO further pointed out:

*“..... the Collector never stated her information requirements very clearly at any one time... she simply requested us to look into the possibility of computerising the welfare scheme to solve many of the problems associated with it... ”.*

The SIO pointed to the political nature of the Welfare Scheme. He said:

*“...you must understand the political nature of this particular scheme .. past records will show that many Members of the Legislative Assembly win the election only by 1000 to 2000 votes - the pensioners' votes are very important ... the politicians should keep them happy... the Chief Minister is a shrewd politician... ”*



In fact, the SIO implicitly suggested that it is the political nature of the scheme that prompted him to keep the initial processing of applications outside the system boundary. The importance given to politics and political stunts by IAS officers was revealed by the SIO. For example, he said:

*“.. the inauguration date was fixed well before the commencement of any work - to coincide with the Minister's visit... therefore, our prime concern was to design a system that would ensure timely disbursement of pension every month, besides providing required information to the Collector... the Collector has to please the Chief Minister all the times .. you know that they can be transferred to a district where there is no water ..”*

Talking about corruption, the SIO suggested that the sanctioning authority and the dispensing authority should never be the same. This leads to corruption and malpractice. But, he said he cannot do anything about it. Even though the SIO and DIO considered a number of alternatives to solve the present problems related to the Welfare Scheme, they did not discuss any of those with anybody simply because they thought it would be a waste of time. The SIO asked:

*“..... what is the point in discussing these issues? With whom are we going to discuss and what do they know....?”*

The SIO appears to be aware that many of the problems associated with the welfare scheme are socio-political in nature. He said:

*“ ...I have read enough about the socio-political dimensions of information systems - if we are to follow such concepts, then continuous support from the top is necessary... this is unlikely to happen... therefore, such concepts will not take us anywhere...I believe that complete automation is the only way to eliminate the problems associated with the welfare scheme... ..but, such things will never happen in India for some time to come....”*

The SIO implicitly suggested that he could prove his performance to his superiors only by increasing the number of projects undertaken for computerisation in the State where he is posted. To this end, he said:

*“ ..the NIC expects me to do my work ... my job is to ensure that state and district governments use computers do their business .. so far, the NIC is happy with my performance ... ”*

#### **6.5.4. Clerical staff at the taluk office**

Although a good number of clerical staffs working at the Taluk Office hold a Commerce or Arts degree, it is not a definite pre-requisite. A large number of them were recruited to the service on the recommendations of politicians. Usually, they are not provided with any kind of formal training at the time of joining the service. Although they require detail knowledge and specific skills to perform a number of tasks and procedures within the Office of the Tahsildar, it is not provided to them formally. For example, the majority of them are not aware why they are doing a particular task or following a particular procedure. They are doing things in a specific manner because they have been asked to do in that particular manner. Instead of a planned formal training, they are asked to work with an experienced member at the beginning of their service. They learn more about their work subsequently when they are asked to work in a specific administrative area. Their knowledge/skills about computers can be assumed to be non-existent. Some of the views and comments expressed by the clerical staff at the Taluk Office about the new information system are summarised below:

Almost all staff are of the opinion that making any suggestions to their superiors to improve the work practices related to the welfare scheme is a waste of time because nobody would listen to them. For example, one of them remarked:

*“... we told very important information about the welfare scheme to the DIO – but he was not willing to listen to those... .. those facts were very important... you do not understand the Indian public administration .. everybody is busy with their own personal work ... why should we suggest anything? .. we just do our work and get out .. you are only asking for unnecessary trouble when you go to do such things ..”*

The clerical staff revealed that they have no knowledge about the information requirements of the Collector. According to them, the Collector's Office usually requests information only if there were going to be any meetings or parliamentary sessions.

Although they are pleased with the new computerised system, almost all staff expressed dissatisfaction about the training provided to them - they pointed out that today they are depending on the DIO even for minor things. They feel that the role of the present system should be expanded, to cover all activities associated with the welfare scheme.

### **6.5.5. The district informatics officer**

The DIO holds a MSc degree in Maths. He was recruited as a Scientific Technical Assistant by the NIC in 1985. He was first exposed to Cobol programming as a part of his training, and then to working with mini computers. In 1988, he was asked to work with one of the systems analysts of the NIC who was developing a production monitoring system for a large manufacturing organisation. In 1989, he was posted to the district of Chennai as an assistant to the DIO. He was promoted as a DIO in 1992. The role played by the DIO during the introduction of computers to the welfare scheme is critical because the task of analysing and designing the information system was delegated to the DIO. Today, the new system is installed, and is being operated within the Information Technology Unit of the NIC in the Collector's Office - which is the office of the DIO too. Some of the DIO's views and comments about the new information system are summarised below:

When asked to comment about the new information system, the DIO said:

*“the Tahsildar's Office is one of the most corrupted offices in India – most of the staffs do not like the welfare scheme... for that matter, they do not like anything that does not give them extra money ...practically, everybody demands money to do any type of work... the DRS Tahsildar was very upset and disturbed during the process of systems development – but the clerks were very helpful and enthusiastic - even though they did not know anything about computers... they were telling me a lot of stories .. stories to put other people in trouble .. I did not bother with any of those..”.*

The DIO said that he does not know anything about the socio-political dimensions of information systems - but was very keen to discuss such issues. He revealed

*“.....I cannot figure out how the informal aspects of the manual system revealed by the staff at the Taluk Office are relevant to designing computer systems...I am also not aware of any tools and techniques that are used to document such issues....”*

The DIO informed that he had extensive consultation with the SIO during the process of systems development and that he was very helpful. However, they were unable to do anything innovative because of the existing hardware and software. According to the DIO:

*“...we had to work with what was provided for us - I believe that we have done our very best...it was very difficult to find the Collector to discuss anything - nobody else was willing to make any contribution to the new system - the staff at the Tahsildar's Office did not know anything about the Collector's information requirements - in fact, they do not know their own requirements...”*

It was revealed by the DIO that transfers of district Collectors present the greatest problem for his work. According to him:

*“... each Collector wants different information in different formats - by the time I organise the required reports and their format, it is time for their transfer - I have to start all over again... I don't have time to make any enhancements to the present system...I spend a lot of time with the staff from the Taluk Office...they are a nuisance also have to look after a number of new projects..... I cannot simply cope with the load of work... I do not have any time to waste with the welfare scheme .. my boss will not accept this maintenance work ..”*

The DIO believes that system design is a technical task and that users have nothing to do with it. Furthermore, he argues that his job was over when the new system was technically completed, and that the Collector's Office must ensure its smooth operation in the future. The DIO said:

*“...I am learning a lot now.. it is very important for me at this stage of my career.. I am*

*very happy to work with the NIC .. I am expecting my promotion very soon.. I want to be a good boy to the SIO... ”*

### **6.5.6. The DRS Tahsildar**

Discussions with the DRS Tahsildar revealed that he had never been consulted by any of his superiors regarding the new information system, especially by the Collector. For example, even the decision to computerise the welfare scheme was taken in his absence, despite the fact that he is the DRS Tahsildar. According to the DRS Tahsildar:

*“ ... manual writing of money orders was always a problem ... it was technically impossible to complete the job in time with available staff ... obviously this resulted in late despatch of pensions... in fact there were many occasions when the general public who came to the Tahsildar's office to attend to some of their work was asked to write few money orders as a special favour.... ”*

When asked to comment about the delays caused by the Revenue Inspector in processing fresh applications, the DRS Tahsildar said:

*“ ...technically, the revenue inspector is supposed to work under the firka tahsildar and the DRS tahsildar ... that is me ... but usually, the revenue inspector ignores my instructions due to the nature of my appointment...I am specially appointed ... this friction causes considerable delays in processing applications ... ”*

The DRS Tahsildar also appears to be not very happy with the Revenue Inspector because of the way he works. For example, he said:

*“ ...when an application is handed over to the Inspector for verification, to goes to the particular place to check the details provided... if the applicant was not there at that particular time, then the application is put aside...most probably it would be looked again only if there is a query about it ... ”*

When asked to comment about external pressures, the DRS Tahsildar said:

*“ .. I cannot ignore the politicians .. they are powerful.. ”*

### **6.5.7. The revenue inspector**

The revenue inspector is of the view that verifying and confirming the details that are provided by the applicants is one of the most difficult jobs. According to him:

*“ ...this is a wild goose chase ... there are always cases where the details given are fictitious...but some important people compel me to approve the application... there were even cases of duplication - one person drawing two pensions in two different names and at two different sites... but I cannot do anything about this ..I have to live... ”*

### **6.6. Conclusion**

The case study presented in this chapter demonstrates how a large number of poor and old pensioners are able to draw their monthly pensions mostly in time today due to the application of computers to the Welfare Scheme. At the same time, the new information system also provides some useful information to administrators of the welfare scheme, which were not easily available when the manual system was in operation. While there is no doubt that these are all great achievements, it is also disappointing to note at the same time that, at the end of the day, the new information system is functioning only within a limited boundary. It can be even suggested that it is primarily a Money Order printing system. Furthermore, many of the original problems related to the welfare scheme still remain unsolved. To this end, the views of different organisational members who are associated with the welfare scheme suggest implicitly, and sometimes explicitly, that many of the problems related to the Welfare Scheme are socio-political in nature. Therefore, they transcend simple and straightforward computer-based solutions. Chapter eight throws more light on this domain.

## CHAPTER SEVEN

### Case Study: The Duty Exemption Scheme

#### 7.1. Background

The Government of India took major policy initiatives in 1991 to bring about macro-economic stabilisation through fiscal discipline combined with a programme of reform of foreign trade, industry, and public sector policies. In line with these remedial measures, on 31 March 1992, the Central Government notified the Export and Import Policy for the period 1992-97. Since the announcement of this Policy, the Imports and Exports (control) Act, 1947, has been replaced by the Foreign Trade (Development and Regulation) Act, 1992, and the Chief Controller of Imports and Exports has been re-designated as Director General of Foreign Trade (DGFT). The provisions of the new Act, and the new designation were aimed to reflect in more clear terms the objectives and the thrust of the current Policy towards promotion and development of Foreign Trade instead of controls and regulations (EXIM Policy, 1992-1997).

Under the new policy, all matters relating to Foreign Trade, mainly exports and imports, are handled by the Office of the Director General of Foreign Trade (DGFT). The Director General of Foreign Trade is the Chief Executive who reports directly to the Minister of Commerce. Throughout India, the Office of the DGFT is represented in 30 different regions. If the trading capacity of a particular region is very high, then the Office of the DGFT is represented by an Office of the Joint Director General of Foreign Trade (JDGFT); otherwise it is represented by an Office of the Deputy Director General of Foreign Trade (DDGFT). Processing different categories of applications related to the foreign trade, issuing import/export licences, monitoring the performance of traders, monitoring trade obligations, implementing new schemes and so on are some of the important activities of the Office of the DGFT.

The Duty Exemption Scheme, aiming to earn foreign exchange by promoting exports, is one of the popular export promotion schemes of the Office of the DGFT. The scheme provides registered exporters the facility to import raw materials for export production at international

prices without payment of custom duty. Up to 1992, all activities associated with this scheme were carried out using a manual paper-based system. In 1992, the DGFT approached the NIC with the proposal to introduce computers to administer the duty exemption scheme. The NIC agreed to computerise the issue of licences as a pilot project at the Office of the JDGFT, Chennai.

The case study described in this chapter concerns the introduction of computers to administer the duty exemption scheme at the Office of the JDGFT, Chennai. Similar to the way the previous case study was presented in chapter six, this chapter also describes the process of computerisation first as a sequence of events as they happened, and then presents some of the views of different organisational members associated with its application.

## **7.2. The Duty Exemption Scheme**

The Duty Exemption Scheme (DES) provides registered exporters the facility to import raw materials for export production, referred to as Inputs, at international prices without payment of custom duty with an obligation of value added exports, so as to make the exports competitive in the international market. Under this scheme, import of raw materials, intermediates, components, consumable, parts, accessories, packing materials, and computer software, required for direct use in the product to be exported may be permitted duty free by the competent authority (EXIM Policy, 1992-1997).

An elaborate exercise was carried out at the beginning of this scheme to determine Standard Input-Output rules. As many as 3883 rules had been fixed and published by 31 March 1994. The DGFT may, on the recommendation of the Special Advance Licensing Committee, modify the rules or prescribe new rules for additional items. Any merchant exporter or manufacturer exporter who holds an Importer-Exporter Code number, and a specific export order/letter of credit, and is in a position to realise the export proceeds in his own name may apply for duty free licences. On the other hand, failure to comply with trade regulations results in defaulters getting blacklisted. The process of blacklisting importers is done mostly by the Enforcement Section. How long a trader is blacklisted, what conditions are required for lifting blacklisting and so on varies according to the type of blacklisting. There are in fact



seven different categories of blacklisting.

### 7.3. The manual system

All activities related to the processing of applications and the issue of Licences was carried out using a manual paper-based system up to the year 1992. Listed below in the order of sequence are the activities and administrative procedures adopted when the manual system was in operation:

- Completed applications for import licences were received by the Reception Clerk. The applicants were given a metal token as an acknowledgement.
- Applications were then sent to a particular Section for processing. The Section Head sorted these applications alphabetically and distributed them to respective Dealing Hands.
- Processing of applications was a cumbersome job. Every piece of information that was provided by the applicant had to be checked. Some of these checks were simple and quick, while others were time consuming and complicated. For example, checking personal details provided in the application form involved only matching those details against the master file; looking for details of traders who have been blacklisted and the type of blacklisting took more time than the previous task; however, checking those items to be imported and the quantity to be imported was very time consuming. Published Input-Output Norms had to be referred in order to match imports against exports, they had to be cross checked with latest amendments, quantities had to be calculated, checks had to be made for prohibited items, and many more similar checks and calculations had to be performed.
- Processing of applications by Dealing Hands resulted in any one of the following:
  - a) Generation of a Deficiency Letter (DL): This letter highlighted *minor* discrepancies in the application. On receipt of this letter, the applicant was expected to collect his or her application, make the necessary changes, and re-submit the application.
  - b) Generation of a Rejection Letter (RL): This letter indicated *major* discrepancies in the application. The applicant was expected to make a fresh application.

- c) Generation of an Office Note to the Controller to indicate that the application was in order.
- Processed applications along with the Office Note were then forwarded to respective Controllers. Every Controller had a particular number of Dealing Hands working under him. The Controllers in turn went through the applications adopting almost the same procedures as that of the Dealing Hands to ensure that everything was in order. Any discrepancies identified by Controllers resulted in a Deficiency Letter or Rejection Letter.
  - If everything was in order, then the applications were forwarded to the respective DDGFT for approval.
  - The DDGFT in turn checked these applications in order to ensure that everything was in order. Discrepancies surfaced even at this stage resulting in a Deficiency Letter or Rejection Letter.
  - The DDGFT would usually approve the application at this stage. On the other hand, if the value of imports had exceeded a certain limit, then the applications were forwarded to the JDGFT for approval.
  - Import Licences related to those approved applications were typed by Dealing Hands and signed by Controllers. Typing a licence and accompanying documents were one of the most difficult and time-consuming tasks, especially with typewriters. These documents, when not correctly produced created a number of problems to the importers at the time of clearing these goods from the customs.
  - The average time taken to issue an import licence was 90 days when the manual system was in operation.

#### **7.4. A way forward**

As the process of economic reforms and liberalisation were stepped up, a number of problems were encountered both by the Head Office and by Regional Offices. Firstly, the Statistical Wing situated in the Head Office, whose responsibility is to provide general and sometimes specific information about foreign trade to the DGFT and to the Ministry of Commerce, was unable to provide such information in time - and most of the time it was found to be inaccurate. The Ministry of Commerce in turn was unable to formulate any meaningful strategies related to the foreign trade without such information. Secondly, the

number of applications for licences was increasing day by day in Regional Offices. Timely disposal of these applications, and monitoring export obligations imposed on licence holders were becoming difficult for the Office of the DGFT. As a result, the average time taken to issue a licence increased significantly. This time delay caused anxiety among the applicants, and they started making representations to the Minister. Thirdly, providing answers to the queries of applicants was becoming harder.

The DGFT in the year 1992 decided to computerise the activities of all his offices. The proposal was first put forward to the respective Technical Director of the NIC in Delhi. A brief feasibility study was carried out by the NIC at the Office of the DGFT in Delhi. This involved mainly studying the hardware, software, and layout of the system. A report about the proposed system was presented to the DGFT. It was accepted by the DGFT, and the Office of the JDGFT (Chennai) was chosen as the first centre to introduce the proposed system. The Technical Director in Delhi delegated the task of developing the new system to the Senior Systems Analyst in Chennai.

The analyst started the systems development process by first studying the administrative procedures adopted for the issue of licences at the Office of the JDGFT (Chennai). The JDGFT in this office is assisted by eight DDGFTs, fifteen Controllers, and one hundred and fifty Dealing Hands. Three Controllers and twelve Dealing hands were directly looking after the issue of duty free licences. No system development methodology was employed explicitly for analysing the manual system. In order to understand the manual system, the analyst practically moved from one table to that another following an application and noting down the activities that were taking place at each table. The workflow thus observed was documented in the form of Data Flow Diagrams and Flow Charts. In addition, the JDGFT's information requirements were also noted. This included both his regular information requirements as well as that of the Head Office's in Delhi.

The flow charts and DFDs representing the manual system were used as a framework to develop a prototype of the proposed system using the software UNIFY - a relational database management system. The prototype was later fine tuned with extensive consultation with Dealing Hands. Timely and accurate information to the management and improved quality of service to the customers were the two main criteria adopted during the process of

system design. Familiarity with UNIFY was the main reason for selecting the software in particular. Selecting the appropriate hardware was not difficult. Only the latest and the very best machines were selected.

The criteria adopted when testing the new system were to put the system to the satisfaction of Dealing hands. A number of faults were identified and rectified during system testing. This was mainly due to the wrong understanding of the manual system by the systems analyst.

### **7.5. Features of the new information system**

The present information system is primarily an on-line relational database system, which was designed using the UNIFY 5.0 Relational Data Base Management System. The database consists of a) Receipt & Issues database; b) Importers/Exporters Database; c) Blacklist Database; d) Advanced Licensing Database; and e) Raw Materials Database.

The new computerised system provides complete on-line communication between Head Office and Regional offices. It also facilitates on-line adhoc queries of officers. A number of reports that are required to frame new policies related to the foreign trade are generated periodically, and/or as and when they are required. For example, the Pendency Status Report, is generated daily to inform the number of pending cases against the processed cases in the FIFO order. The monthly reports include section wise receipts and disposals. The yearly reports inform the number of cheques issued (month wise), amount disbursed through cheques (month wise), number of licences issued (month wise), number of scripts issued (month wise), and so on.

The system is linked on-line with the Receipt & Issues database, Importer-Exporter profile database, and Blacklisting database, thus providing online checks during processing. Utmost care has been taken to stop unauthorised persons tampering with data. Security is enforced at three levels to ensure maximum safety of data. To prevent unauthorised access to the system, each user is provided with a changeable, encrypted password along with his employee code. Each user of the system is given a set of privileges to access options. In the low-level security, each application is registered in the name of one dealing hand. No others

can modify the application details, but can only take the report of it. Another important security feature of the new system is that whenever someone accesses a file, the system automatically logs the details of the user and action performed. Besides these levels of security, the operating system security of owner, group, and user is also implemented.

The following training programmes were conducted by the NIC at the Office of the JDGFT before the new system became operational:

Computer awareness	1 Week
Receipt and Issues Subsystems	2 Weeks
Import Export Code Subsystem	3 Weeks
Black Listing Subsystem	1 Week
Lyrinx	1 Week
Licence Printing	1 Week
Advance Licensing Subsystem	2 Weeks

Two staffs from the NIC were temporally posted to the Office of the JDGFT to carry out day-to-day maintenance of the system. Because of their presence at the site, user manuals were considered unnecessary, and were not produced. The cut off date was set, and all applications received after the cut-off data were processed using the new system. The databases required to process new applications were updated simultaneously.

Organising adequate spares of terminals, organising regular keyboard/printer cleaning, organising consumables like floppies, stationeries, cartridges etc., are some of the regular maintenance task carried out by the NIC staff, besides attending to hardware failures. Software maintenance was more complex than the hardware maintenance. At the beginning, it involved mainly performance tuning for better response. However, as days passed, Dealing hands started to ask for different amendments in the software to make their work easier.

When the system was up and running, continuous informal evaluation was taking place in terms of speed, accuracy, customer satisfaction, user satisfaction etc., and remedial actions were taken wherever necessary. No formal evaluation was carried out. The project took

approximately six months to complete. During this period, the analyst had two programmers and two hardware technicians at his disposal.

## **7.6. Issue of licences: Proposed method**

The system analyst proposed the following sequence of activities to be adopted when issuing licences using the new system:

- Completed applications for import licences would be received by the Reception Clerk at the Receipt & Issues Counter.
- Some of the basic checks such as personal details, blacklist information and so on would be performed at the R&I counter itself by interacting with the Importers/Exporters database and the Blacklist Database. Any discrepancies found would be notified by the R I counter and the applications returned for necessary corrections.
- If everything were in order, then a unique file number would be allotted to each application by the Receipt and Issues sub system. Two copies of acknowledgement indicating the file number and other details would be printed. One would be given to the exporter and the next would be attached to the application form.
- Sectionwise statements would be printed at the end of the day by the Receipt and Issues sub system, grouping applicants in alphabetical order. This statement would contain file numbers and other necessary details about applicants.
- Applications and sectionwise statements would then be forwarded to respective sections at the end of the day to be distributed to Dealing Hands for further processing.
- By inputting the Import/Export Code of the applicant, some standard attributes of an applicant would be retrieved from the Importers/Exporters database. These attributes would be checked against the application form, and then transferred to the Advance Licensing database. The rest of the details in the application form would be keyed in. The system would carry out several validation checks at this stage.
- By interacting with the Raw Materials database, the system would specify items, which could be imported, their quantities, values, and so on.
- The system would generate Deficiency Letter or Rejection Letter at this stage.
- If everything were in order, then Dealing Hands would prepare an office note to

Controllers, in the computer system itself.

- Controllers would go through the office note in the computer system, and a decision would be entered in the database.
- The DDGFT would go through the system and enter his decision.
- A draft licence would be printed by Dealing Hands, which would be checked by Controllers.
- The final licences would be printed by Controllers. This function would be controlled through a password.
- The licence would be issued to the customer by the Receipt & Issues section.

### **7.7. Issue of licences: Current method**

Today, the sequence of activities that is being followed by the office of the DGFT (Chennai) to issue licences is totally different from that one suggested by the system analyst. In fact, the following procedures have been primarily worked out by Dealing Hands and Controllers:

- Completed applications for import licences are received by the Reception Clerk at the Receipt and Issues counter. Instead of giving a printed acknowledgement from the computer system, a metal token is given to applicants as an acknowledgement.
- Applications are sorted manually and despatched to the appropriate Section at the end of the day, instead of sorting it according to sectionwise statements produced by the computer system itself.
- The Section Head distributes the applications among Dealing Hands according to alphabetical groupings.
- Dealing Hands manually check these applications, using a calculator wherever necessary, instead of interacting directly with the computer system. Discrepancies are noted.
- Applications with necessary comments are sent back to the Receipt and Issues counter.
- It is at this stage that a printed acknowledgement from the computer system is given to the applicant by the Receipt and Issues Counter, if everything is in order with the application. Otherwise, the application is returned to the applicant for necessary corrections and the applicant re-submits his or her application after necessary corrections.
- Once the acknowledgement is given, applications are again forwarded to Dealing Hands.

- Dealing Hands now start to transfer data from the application to the computer system. Most of the quantities and values stated in the application form are cross-checked before entering into the system, again using a calculator. On completion, a printout is taken and is checked with the original application. Corrections are made wherever necessary.
- An office note to the Controller is generated manually and the paper file along with the office note is forwarded to respective Controllers.
- The applicant's file is manually checked by the Controller. This process often leads to the generation of a Deficiency Letter or Rejection Letter. If everything is in order, the applicant's file is forwarded to the DDGFT.
- The DDGFT goes through the same procedures similar to that of the Controller. This too at times leads to the generation of a Deficiency Letter or Rejection Letter. If everything is in order, then depending on the value of the licence it is forwarded to either the JDGFT or an order is issued for the issue of the licence.
- The draft licence is printed by Dealing Hands and checked by Controllers.
- The final Licence is printed in the Controller's room using his password.
- The licence is forwarded to the Receipt and Issues counter. The applicant collects his or her licence from the counter.

In sum, today, the Office of the DGFT (Chennai) is running two systems in parallel. The first is the original manual system, which is being followed almost in a similar manner without much change. The second, is the new computerised system, which is in fact used as a complementary system where data is transferred from paper at suitable intervals from the time an application is received to the time of issuing the licence. However, with the new computerised system in place, the office of the DGFT (Chennai) is able to:

- Provide on-line information to Delhi.
- Provide periodic reports.
- Print import licences without many hassles.

## **7.8. Organisational members**

The application of computers to the Duty Exemption Scheme involves the activities of a



number of organisational members. This section briefly looks at their educational/training background first, and then presents some of their views and comments regarding its development and operation. Since the main objectives of the new system is to provide improved quality of service to the customers and provide timely and accurate information to the DGFT, this section presents their views first and then go to present that of the others.

### **7.8.1. Customers**

Informal discussions with a number of customers suggest that a good proportion of them really believe that computers can improve the quality and quantity of work. However, when it comes to the Office of the DGFT, they are very pessimistic. In fact, most of them strongly expressed their dissatisfaction regarding the present computerised system. Some of the views and comments expressed by customers are summarised below:

The majority of customers are of the view that the new system has not improved things in any way. In fact, they feel that it is taking more time now than earlier to obtain an import licence. On the other hand, one of them said:

*“... computers have nothing to do with the issue of licences in time ... it is only a way of fooling us .. it all depends on whom you know inside and how much you are prepared to spend... this is how I always get my licences in time... they are not interested in their work and that they always look for mistakes in an application... even for a very small error they send them a DL .. and keep the file one side ...”*

One angry customer was asking:

*“...what is the point in computerising this scheme when the staff don't like to work with computers...the other day I went inside to see one Controller... none of them were using computers...everybody was busy with calculators and paper files... ..there was not even a computer in the controller's room...his table was full with papers... how can we expect them to use computers and give our licences in time..”*

The secretary of a large garments export firm commented:

*" ... they always have very good excuses to delay the issue of licences... the computer system was introduced at the right time because they were running out of good excuses... now they blame the computer for everything - no electricity - the printer is not working - the UPS (Uninterrupted Power Supply) has problems - the whole computer system is down, and so on... we are fed up with these excuses... but we have no other choice other than to come and wait in this office...."*

A few number of customers are of the opinion that the whole system needs reorganisation - the government has to increase the salary of all its employees - the attitudes of the staff have to change - the procedures have to change - the government should be honest of what they are doing - without such changes, any new systems, whether computers or no computers, nothing will ever work. A large number of customers blamed entirely the Dealing Hands for the delay in getting their licences.

### **7.8.2. The DGFT**

The DGFT is a very senior IAS officer. He was very formal, and at the same time, was not willing to discuss much about the Duty Exemption Scheme. His information systems related knowledge/skills could be suggested to be technological. This is evident from one of his published articles titled 'Information Technology – Indian Scenario' (Ghosh, 1997). Some of his views about the new computerised system are summarised below:

When asked about the old manual system and the new computerised system being operated parallelly, the DGFT reacted:

*" .. we cannot expect miracles to take place... even though we had been talking about computers for a very long time, it is only after the liberalisation that computers became very popular - we are only talking about a period of five years... it happened too quickly - our country, our organisations, and our people are not ready for it -we have to prepare ourselves. we are in the process of learning. we have achieved quiet a lot - there is a lot more to achieve.... obviously, things will not happen as it is happening in the UK now.... we may have to go through a period of transformation - it may not be very long. but we cannot*

*avoid going through those changes...."*

When questioned about corruption, the DGFT implicitly admitted that there is corruption at all levels within his Offices. However, he believes that computers can reduce corruption by creating more openness in the work environment.

The DGFT also believes that computers can provide accurate and timely information that are required to formulate new policies, especially when the country is in the process of introducing reforms to the foreign trade.

### **7.8.3. The systems analyst**

The system analyst that the NIC selected to computerise the duty exemption scheme is one of their senior systems analysts. He holds a Bachelor and a Master degree in maths. In addition, he has successfully completed a Master degree in computer applications. He has worked for the NIC for more than six years. During this period he has completed a number of short-term training programmes offered by the NIC that were predominantly technological in nature. Although he has worked on a number of projects as an employee of the NIC, the Duty Exemption Scheme is the largest project that he has ever undertaken. Some of his views and comments about the new information system are summarised below:

According to the analyst:

*"....I was simply overwhelmed when I heard that I was going to computerise the Duty Exemption Scheme... the DGFT is a popular person in the political circle and one of the Minister's favourites....though the DGFT could not define system requirements very clearly at the time of initiating the project, he was very happy with the system that was proposed by the NIC Head Office in Delhi....in fact, it is the Minister who is behind all these activities .. he is very dynamic ...you cannot simply fool him ...he keeps all the people around him on pins...they simply say yes to everything that he says .... the DGFT was very much committed and gave his full support during the process of system development...in fact, I was answering queries originating from two different sources when I was working on the project - the NIC and the Office of the DGFT....but, the JDGFT I think did not like me*

*communicating directly with the DGFT....”*

When asked to comment about the environment at the office of the DGFT (Chennai), the analyst commented:

*“ ...I found the whole environment very hostile when I first walked in... the Dealing Hands and Controllers, who were supposed to tell me about the manual system, were reluctant to talk to me ... I had to move from one table to another ...I knew exactly why they were not happy with me ...the whole office is corrupted .. even if someone is honest, the business people will somehow or other makes them corrupt .. this is one of the biggest problems in India ... in the case of the DDGFTs and the JDGFT, they were very formal – I didn't know whether they were purposely avoiding me...but I think they have a number of reasons to avoid me ... you know the reason ..accountability, taking responsibility and so on...you see I had the support of very big people.. I was determined to study the manual system by any means.. because after that, it is my job... ”*

When asked about the absence of a complete feasibility study before the commencement of the new project, the analyst asked:

*“... why? I could not see any sensible reason for doing such a study - it was not required in our case ... we just wanted to start.. ”*

The analyst revealed:

*“... nobody knew anything about computers in the office of the DGFT.. it was very difficult to communicate... the Dealing Hand who was asked to work with me was one of the most unproductive persons in the Office - he knew nothing...I had to place myself in the position of users and imagine what was appropriate for them....in fact, I was working on my own most of the time...the Dealing Hands were very happy to see snapshots of the new system... they never expected such things... they were able to see that their work was going to be easy... ”.*

When asked about the old manual system and the new computerised system being operated

parallelly, the analyst suggested a number of reasons for it:

*“...the Controllers and Dealing Hands made repeated representations to the JDGFT pointing to a number of faults in the computer system...they frightened him with issues of accountability and responsibility... suitable operational arrangements were not in place to update necessary databases as and when changes were made to the input/output norms and other related issues...this resulted in Dealing Hands getting disgusted when Controllers - who knew about such changes before hand - pointed out that the work they had been doing using the database had obsolete data... Dealing Hands ensured that every minor problem caused by the computer system resulted in unusual delays in issuing licences...the JDGFT had no other alternative other than to give in to the suggestions of dealing hands and controllers...they wanted to have their own way of working .. you know, for obvious reasons...”*

The analyst pointed out:

*“...when the new system became operational, nobody wanted to take any responsibilities related to the computer system...it was total chaos...the dealing hands were approaching me most of the time even for matters that had nothing to do with the computer system...the only way that was available for me was to keep away from the Office of the DGFT and allow them to settle their own affairs....”*

According to the analyst:

*“...the present system has everything to make the Office of the DGFT more effective and efficient.... nobody appears to be using those features...”*

#### **7.8.4. Dealing hands**

The majority of Dealing Hands working at the Office of the DGFT (Chennai) hold a Bachelor degree in either Arts or Commerce. They have also been provided with a specific in-house training in matters related to the Duty Exemption Scheme. Their knowledge/skills about computers can be assumed to be non-existent. Some of the views and comments expressed by Dealing Hands are summarised below:

The majority of Dealing Hands feel that they are the people who do the maximum amount of work related to the issue of import licences. One of them said:

*“.....we are the people who do all the work in this office ... the others are just there to find fault in our work... at the end of the what we get as salaries is not enough to pay even our house rent ...”. At the same time, there was one amongst them who said “ ... .. all my colleagues are corrupted... they simply do not know how to live within their means... corruption is just a habit....I mind my own business ... it is of no use talking about such things ... ”.*

When discussing about those who apply for import licences, one of them remarked:

*“ ... don't sympathise with our customers....some of them are real crooks...they purposely make mistakes in their applications....if we don't check, then they stand to gain... but, if they get caught at the customs, then we are in real trouble....therefore, we take our time to issue their licences....”.*

Similar to those clerical staff at the Tahsildar's office, Dealing Hands also claimed that none of their bosses are prepared to consider their views or consult them on occasions when changes are considered in the present system. However, according to them, they are the only people who understand the practical problems.

When talking about present work practices, one of them said:

*“... the NIC should not tell us how to work... they favour the central government .. they also do not understand the nature of our work and problems related to it - finally, we are answerable... the work practices that we have devised today suit everybody ... ”*

### **7.8.5. Controllers**

Controllers act as an interface between Dealing Hands and DDGFTs. They are mostly Grade B civil servants. Although they have been provided with a general administrative training at

the time of joining the service, their information systems related knowledge/skills could be suggested to be non-existent. Almost all the controllers who are working at the Office of the DGFT (Chennai) are of the opinion that the present computer system is a nuisance. In their view, what is required is a complete reorganisation of the manual system - not computers. Some of their comments and views are summarised below:

One of the Controllers pointed out:

*“...there is nothing much difference between the previous manual system and the present computerised system...Dealing Hands now have an additional job of inputting large quantities of data into the system... today, it takes longer for Dealing Hands to finish their work... as a result, it takes more time to issue a licence under the present system...”*

Many of them implicitly suggested that people in Delhi are to be thinking that they are smart. According to the Controllers, the new computer system was introduced with the intention of closely monitoring and controlling their work rather than providing better service to Traders or obtaining information for policy formulation. A number of Controllers are of the view that delays in issuing licences have nothing to do with the manual system. One of them remarked:

*“...there is nothing wrong with the present system...all what we need is more staff...the government does not want to increase the number of staff ... it is all politics ..we have a high proportion of female staff - many of them go on maternity leave very regularly - replacements are not always made under these circumstances...the Government doesn't want to give us more staff...as long as such problems are not solved, nothing can be achieved.....”*

When talking about irregularities and corruption, one of the elderly Controllers admitted that some of his colleagues (Controllers) delay files unnecessarily - for obvious reasons he hinted. When talking about Traders, one of the Controllers reacted:

*“ ... the traders are to be blamed for the delay in issuing licences....they have been doing this business for a very long time, and yet they cannot fill in the application forms properly....they make so many silly mistakes. ...these have to be corrected before we start to*

*process them....they do not adhere to the procedures....they do not submit the necessary documents in time....obviously, correcting all these takes time - computers have nothing to do with it...." He further argued " ... what is the big idea of introducing computers when we do not have even the very basic requirement – electricity ...on an average we have five to six power failures a day lasting from ten minutes to an hour... above all, I don't think that anybody in the Head Office is using the information provided by this system to make decisions....how many of them know about computers or information? all these concepts are very new to them.... I know how they make decision....computers are just a fashion. More than that, it is all politics... "*

Most of the Controllers agreed that Dealing Hands are very enthusiastic about the new system mainly because it has made some of their work very easy, for example printing of import licences.

## **7.9. Conclusion**

The case study presented in this chapter demonstrates how a computer-based information system that appears to be incorporating a number of useful features is being used only in a complementary manner along with the old manual system. Consequently, many of its features remain unused and most of the original problems associated with the Duty Exemption Scheme remain unsolved. The next chapter throws more light on this domain.



## CHAPTER EIGHT

### **Interpretation: Performance of organisational members**

The case studies presented in chapters six and seven illustrate the limited amount of success achieved by the introduction of computers to administer two different schemes in India. The first is the Social Welfare Scheme, introduced by the State Government of Tamil Nadu, and the second is the Duty Exemption Scheme, introduced by the Central Government of India. As already discussed in chapter one, successful application of computer-based information systems within organisations depends to a great degree on the performance of different individuals associated with different stages of information systems development. The task of implementing information systems is so complex and demanding, it is essential that all members perform to the best of their abilities during different stages of systems development, and these two case studies are no exception. To this end, it is a common assumption that providing information systems related education/training to organisational members is the key to improve individual performances. However, chapter two argued that a number of micro and macro environmental conditions, which are constituted by organisational politics could play a critical role in constraining the performance of competent individuals. While organisational structure, organisational culture, organisational practices and subjectivity constitute micro conditions; socio-political, socio-economic and socio-cultural factors constitute macro conditions. These context-specific conditions arising through political processes cannot be separated from the development and deployment of information systems within organisations. In fact, information technologies have often been productive of particularly intense organisational politics because IT represents considerable complexity and uncertainty.

As described in chapter three, organisational members, when involved in a particular activity in a particular environment, interpret the situation, and act accordingly. Their interpretation is expressed in their actions and practices. Researchers, by immersing themselves in the participants' world, can understand their actions. By relating their actions to the specific environment in which these actions take place, they can offer directions for positive changes for the future. The aim of this chapter is to interpret the activities of organisational members associated with the introduction of computers to the Welfare Scheme and the Duty

Exemption Scheme (Table 8.1). The interpretation draws on the macro and micro environmental conditions described in chapters four and five, and at the same time, as a supportive measure, refer to some of the statements made by different members about respective information systems. These statements form part of the case studies documented in chapters six and seven. The discussion commences with research findings that are about different organisational members who are associated with the application of computer-based information systems within the public administration of India, in today' context. This includes a brief discussion about their education/training background. The discussion proceeds to point to the nature of the present environment in which the activities of these members are taking place, and the extent to which their performance is constrained by the environment. This enables the researcher to make broad recommendations for positive changes for the future.

<b>Members</b>	<b>Activities</b>
The collector	Proposed the Welfare Scheme for computerisation/Requested system features/Made operational arrangements/ Uses system outputs.
State Informatics Officer	Accepted the proposal of the Collector/ Guided the DIO during systems analysis and design.
District Informatics Officer	Analysed the manual system/ Designed the present system/ Maintains the present system.
Staff at the Taluk Office	Provided information about the manual system/ Operate the present system.
The DGFT	Proposed the Duty Exemption Scheme for computerisation/Requested system features/Uses system outputs.
The Technical Director	Accepted the initial proposal of the DGFT/ Delegated the senior systems analyst to design the system.
Senior Systems Analyst	Analysed the manual system/Designed the present system/Maintains the present system.
Dealing Hands	Provided information about the manual system/ Participated in systems design/ Operate the present system.
JDGFT	Defined information requirements.
Controllers	Provided information about the manual system/Defined information requirements.

**Table 8.1. Organisational members and Activities**

## 8.1. Organisational members

Drawing on the two case studies, the current study conceptualises organisational members associated with the application of information systems within the public administration of India, in today's context, to be consisting of the following categories:

1. The first category concerns organisational members who formally propose different projects that need to be computerised within the public administration. For example, the Collector proposed the Welfare Scheme for computerisation, and the Director General of Foreign Trade proposed the Duty Exemption Scheme for it. The need to introduce computers within a specific administrative domain usually emerges as a formal proposal from this group of members. The current study addresses this group of members as **System Initiators** - i.e., those who initiate new projects for computerisation. The majority of system initiators belong to the all-India services. For example, both the Director General of Foreign Trade and the Collector belong to the Indian Administrative Service. System initiators hold excellent academic qualifications. The administrative related education/training provided to them at the beginning of their service make them well aware of India's socio-cultural, political, and socio-economic conditions. They are also aware of the constraints within which they have to function. However, the same cannot be said about their information systems related knowledge/skills. As already presented in chapter five, the nature of IS related education/training offered to them by the National Informatics Centre are clearly limited in scope and content in terms of system initiators' occupation.

2. The second category concerns organisational members who design and develop information systems for the public administration. While the Collector approached the State Informatics Officer of Tamil Nadu with her proposal to computerise the Welfare Scheme, the Director General of Foreign Trade approached one of the Technical Directors of the NIC with his proposal to computerise the Duty Exemption Scheme. While the State Informatics Officer delegated the task of systems development to the District Informatics Officer, the Technical Director delegated the task to the Senior Systems Analyst of Tamil Nadu. The current study refers all members of the National Informatics Centre who design and develop computer systems for the public administration as **System Designers** - i.e., those who design

and deliver information systems. System designers, as described in chapter five, hold either computer science degrees or some other general degrees usually related to engineering. From time to time, the NIC also provide system designers with a number of in-house training programmes that are predominantly technological in nature, which aim to increase their current awareness.

3. The third category concerns organisational members who operate the new information system to process transactions at the operational level. For example, the staffs at the Tahsildar's Office operate the new system to despatch pensions, and the Dealing Hands operate the new system to issue licences. The current study calls these members as **System Operators** - i.e., those who operate the information system to produce necessary outputs. The majority of system operators working for the Central Government hold at least a Bachelor degree, usually in Arts or Commerce. Many of them hold even a Master degree. However, entry requirements of system operators working for the State Government are somewhat ambiguous. In today's context, information systems related knowledge/skills of system operators could be declared as non-existent. Today, the only formal information systems related education/training available to system operators is the short-term, on-the-job training that is conducted by the NIC just before an information system becomes operational within their department.

4. The fourth category concerns organisational members who are at the tactical level and act as an interface between system initiators and system operators. In today's context, they do not, or need not explicitly associate themselves with any of the activities related to the application of information systems. For example, the Tahsildar kept away from any of the activities related to the computerisation of the Welfare Scheme. Similarly, the Controllers did not involve themselves in any of the activities related to the computerisation of the Duty Exemption Scheme. The current study refers to these members as **System Managers**. System managers usually belong to either Grade A or B of the civil service. Like system operators, system managers' information systems related knowledge/skills could also be declared as non-existent.

5. Finally, the fifth category concerns organisational members who have the ultimate power in today's context to make or break information systems within the public administration.

Though this group of members associate themselves only indirectly with the application of information systems, system initiators are under the direct influence of this group of members. Essentially, system directors either are politicians or have close relationships with politicians. For example, in the case of the Welfare Scheme, the Chief Minister of Tamil Nadu and the Minister of Welfare for the State of Tamil Nadu were in a position to influence the activities of the Collector. Similarly, in the case of the Duty Exemption Scheme, the DGFT had to consider the views of the Minister of Commerce. The current study refers all such members as **System Directors** - i.e., members who direct the path of information systems. The majority of system directors, specifically those, who belong to the state and districts governments, do not have any formal qualifications. In fact, they need not have any specific qualifications to be in their position. Some of them even have a criminal record. On the other hand, few system directors are highly qualified, often with degrees offered by some of the elite universities in the UK or the USA.

## **8.2. Performance of organisational members**

Drawing on the two case studies, this section on the performance of organisational members illustrates how the micro and macro environmental conditions play a critical role in determining the performance of the above five categories of organisational members. At the same time, the illustration also points to the fact that, within this environment, information systems related knowledge/skills of organisational members have a very little role to play in terms of improving individual performances. At the same time, none of these members chooses these conditions. They simply encounter these conditions as a given reality, and consequently these conditions compel them to act in particular ways, which are obviously not their rational choice. What is important to note is that these environmental conditions are interdependent and interrelated, and together they form a complex whole. Therefore, they cannot be separated and examined individually. However, in this chapter, they are discussed individually most of the time only as a method of encapsulating and presenting the research findings. Some of the macro and micro environmental conditions that compelled organisational members associated with the two case studies to act in particular ways are discussed below.

- The relationship between system initiators and system directors.
- The sensitive nature of Centre-State relations.

Today, the price of politics is very high in India. Politicians depend largely on rich businessmen to nurse their constituencies. Businessmen on the other hand, approach system initiators either directly or indirectly to speed up bureaucratic procedures related to their business files within the public administration. System initiators know that behind the requests of business people is the support of higher level politicians. System initiators' promotions and postings are highly politicized. Their career depends to a great extent on how good are they with their political bosses. An obliging system initiator is considered meritorious. System directors often use the threat of transfer to bend administrators and even make them comply with unethical or downright illegal orders. Consequently, today, both system initiators and system directors have learned to accommodate each other in a variety of matters. The most infected area by it is the district administration where the give-and- take policy is the norm. However, on the other hand, conditions created by the kind of relationship between system initiators and their political bosses prevailing in today's context, then, is one of the most important factors that constrain the activities of system initiators during the application of information systems.

Today, system initiators are proposing a number of projects for computerisation. Obviously, such proposals have to come primarily from system initiators because of the nature of their occupation. However, drawing on the case studies, it can be argued that a proposal originating from a system initiator to computerise a particular project need not necessarily mean that it is his or her own rational choice. This also does not mean that he or she has fully realised the need for it, or would support the project whole heartedly through out its life. Rather, it appears that the sensitive nature of the relationship prevailing in today's context between system initiators and system directors compels system initiators to propose particular projects for computerisation. For example, the Collector's proposal to computerise the Welfare Scheme illustrates this phenomenon very clearly.

In the case of the Welfare Scheme, there is no doubt that this scheme did cause a number of administrative problems to the district Collector. However, these problems are not something

new or particular only to the Welfare Scheme. Such administrative problems have always been there within the public administration of India, and the Welfare Scheme cannot be an exception. The administrative related education/training that the district Collector had received and her experience make her well aware of the inadequacies within the public administration, and the factors that cause such inadequacies. When compared to her overall administrative responsibilities and associated problems as a Collector of a Metropolitan city like Chennai, the Welfare Scheme is something that is very trivial. It concerns only 45,000 old and poor pensioners. Obviously, many other projects need immediate attention.

To this end, the current study argues that it is the political dimension of the Welfare Scheme that prompted the Collector to select this particular scheme for computerization. The point to be noted in this context is that Tamil Nadu is a very prosperous state. The ruling party will go to any length to continue to stay in power because the more prosperous a state is, the better is their personal revenue. As pointed out by the state informatics officer, Members of the Legislative Assembly win elections only by few hundred votes. Hence, the votes of pensioners and their goodwill are important to the ruling party because of the tough competition. Therefore, problems related to the Welfare Scheme are more sensitive and important to the ruling party than any other scheme with same dimensions. Furthermore, ruling party politicians always look for something new and exciting for propaganda purposes. To this end, the message of computerizing the Welfare Scheme will do doubt sell well. The Chief Minister of Tamil Nadu is aware of all these facts. She expects the Collector also to understand these issues. Under these circumstances, it is fair to argue that the Collector has no other alternative other than to select this particular scheme, although it may not be the right choice from her own point of view. Today, although the Collector claims that her proposal to computerize the Welfare Scheme was primarily aimed to benefit the old pensioners, I would argue that the Collector's proposal was primarily aimed to please the Chief Minister of Tamil Nadu, her immediate political boss. When asked to comment on this issue, the state informatics officer remarked:

*"... ..you must understand the political nature of this particular scheme. The Chief Minister is a shrewd politician. The Collector has to please the Chief Minister...otherwise she may be transferred to a district where there is no*

*water... ..”*

Similar phenomenon can be also observed in the case of the Duty Exemption Scheme, although it is not so explicit as in the case of the Welfare Scheme. For example, the Director General of Foreign Trade was given this special post at a time when the Government of India was in the process of introducing far reaching socio-economic reforms. His immediate boss, the Minister of Commerce was depending on the DGFT for guidance and advice. As indicated in the case study by the systems analyst, the Minister, unlike many others, was dynamic and well educated. In fact, he is foreign educated. The government was expecting a great deal from this Minister in terms of taking appropriate measures to reform the Foreign Trade. The Minister too wanted to contribute his share by modernizing the foreign trade. In this context, the Minister was concerned about a number of issues, which include:

- The inability of the Statistical Wing to provide reliable and timely information, which was required for framing new trade policies;
- Corruption and delays at the field Offices of the DGFT;
- Repeated complaints from Traders about the performance of the Office of the DGFT.

The case study illustrates the Minister's view about computers. He strongly believed that computerizing most of the functions and procedures at the Offices of the DGFT is the only way to address the majority of problems that they were facing. Obviously, the Minister expected the DGFT to contribute his share. The DGFT cannot overrule the Minister. In fact, he is given this special post to cooperate with the Minister. Under these circumstances, it can be argued that the DGFT's proposal to computerize the issue of licenses is not his own decision. It was just an echo of the Minister's view. The DGFT simply acted accordingly. As far as he is concerned, it may not be the right decision. As the senior systems analyst put it:

*“.....it is the Minister who is behind all these activities. You cannot simply fool him. He keeps all the people around him on pins....they simply say yes to everything that he says....”*



Although it has been argued so far that the contextual conditions created by nature of the relationship between system initiators and their political bosses is one of the most important factors that constrain the activities of system initiators, there are other equally important conditions too. The sensitive nature of the relationship between the center and the different states in India can be suggested to be another important contextual condition that constrains the activities of system initiators.

To this end, India was never a united political entity. It is only after national Independence that Indians have started to rule their own country as a single political entity. Since National Independence, relationships between the Centre and the States have always remained a sensitive issue in India. There have always been power disputes, there have always been a lot of pushing and jostling in the attempt to succeed, and there have always been horse-trading between the centre and states in the attempt to hold on to power. On one hand, the Indian Constitution has devised a system in which central planning is backed by central financing. On the other hand, heterogeneous political groups are forced to forge unstable governments today, which often collapse under the weight of their own heterogeneity and internal contradictions. Consequently, the patterns of centre-state relations have also come to depend on the relative power positions of major political parties. At the same time, India's different efforts to decentralise functions from the Centre to the States and from the States to the Districts have been dismal. The point to be noted in this context is that system initiators being general administrators, have to consider the sensitive nature of the centre-state relations very carefully when making decisions, and decisions concerning computerisation are no exception. The sensitive nature of centre-State relations, then, influences the activities of system initiators, which in turn affect the quality of the final information system. For example, the Collector's proposal to computerise the Welfare Scheme and the DGFT's proposal to computerise the Duty Exemption Scheme were partly influenced by this phenomenon.

In the case of the Welfare Scheme, it can be argued that the district Collector has to work according to the central government's technology policy. This policy actively promotes computer applications within government departments as a measure of overcoming some of the inadequacies within the public administration. To this end, there have always been compelling signals from the Central and State Governments. For example, the formation of

the NIC and the presence of the information technology unit of the NIC in every District Collector's office indicate this explicitly. Consequently, today, there is a general trend in every State to introduce computers within government departments. Her predecessors have done this without questioning, and her successors will do the same. As a District Collector, she too has to fall in line with this trend. She is too small to question issues of this nature because the centralising force is very powerful and complex. On the other hand, the Central Government implicitly, and sometimes explicitly assesses the performance of different states by the number computers installed within their government offices. Although states are said to enjoy a greater amount of autonomy today, they continue to depend on the centre on a number of issues. To this end, the Chief Minister of Tamil Nadu expects the Collector to contribute her share. At the same time, it should be noted that the technology policy, which promotes computer applications within government departments, does not clearly spell out a number of important issues. For example, it does not tell which projects should be computerised first, or on what basis they should be computerised or which aspects of it should be computerised. Under these circumstances, it can be argued that the Collector was compelled to propose the Welfare Scheme for computerisation primarily because of its political dimension and then due to the nature of relationship between the centre and the state. The Collector was cautious when asked to comment on this issue. However, she remarked:

*“.....I do not believe in automating any of our businesses. This should not be our aim too – but I must implement the government's priorities .....”*

In the case of the Duty Exemption Scheme however, funds were already allocated for computerising the Offices of the DGFT on targets set by the Planning Commission. Again, this was in line with the technology policy of the central government. The DGFT happened to assume duties at that particular time when on one hand, the Minister wanted to see computers in place, and on the other hand, he has to utilise the allocated funds for introducing computers. Under these circumstances, it can be argued that the DGFT has no other alternative other than to approach the NIC with the proposal to computerise the Duty Exemption Scheme. The DGFT in his position would not obviously question the issue of effectiveness or the validity of introducing computers within his offices. On one hand, the

issue is complex and is not going to be resolved easily, and on the other, it is not going to bring any benefits to the DGFT. In fact, it can only harm him.

The review of literature in chapter two suggests that those who propose projects for computerisation should be provided with appropriate IS related education/training so that they can understand the utility of information, suggest appropriate application, sketch information needs, set objectives and approve area of application. However, the foregoing analysis on system initiators' activities during the stage of project proposal brings out two important issues. Firstly, the present education system obviously does not provide system initiators with a broad view of information system and therefore they cannot demonstrate all the abilities that are required during the stage of system initiation. Secondly, and more importantly, system initiators cannot demonstrate their abilities in today's context even if they had been provided with a broader view of information systems, simply because the environmental conditions are very powerful.

- **The way the NIC conduct its business**

The NIC was set up in 1975 by one of the most popular Prime Ministers of India - Indira Gandhi. Since then, the NIC has managed to receive the continuous support of different central Governments. Today, its role is defined as that of creating computer awareness and implementing computer-based information systems within government departments. However, the point to be noted in this context is that the NIC is not a statutory organisation. Its existence and operations are not recognised by the Constitution of India. Consequently, there is no guarantee that the NIC would continue to exist in the future. Furthermore, informal discussions with a number of learned people in India suggest that the NIC is essentially a one-man operation - Dr Seshagiri, the Director General of the NIC whose name today has become synonymous with the NIC. All these facts point to the implicit need of the NIC to demonstrate its indispensability in order to justify its continuous existence and operations. Clearly, one way of achieving this is by ensuring the spread of computers both within the central and state governments. To achieve this, the NIC appears to have its own administrative norms and performance targets.

The NIC has a tall professional ladder, the lowest position being the Programmer Assistant and the top one being the Deputy Director General. The staffs of the NIC are promoted every three years. They are promoted not because there are vacancies in the higher grades, but due to the number of years that they have been working in a particular grade. Essentially, they get their promotion and stay in their original places, of course with an increase in their pay. The number and nature of projects that they have completed during their term usually assess their performance. It should be noted in this context that the quantity of projects appears to be more important to the NIC rather than their quality because there are no explicit mechanisms within the NIC to formally evaluate completed projects. In a status conscious society, clearly, system designers would like to climb to the top of the ladder. At the same time, an increase in pay brings in its own benefits. However, on the other hand, the target driven approach of the NIC, and the way the NIC assesses system designers' performance affect the activities of system designers, as system designers tend to move from one project to another within the shortest possible time, ignoring the quality dimension of information systems. Therefore, the conditions created by the formation and existence of the NIC, then, is one of the factors that constrain the activities of system designers.

For example, in the case of the Welfare Scheme, the SIO has been working in the State of Tamil Nadu for almost ten years, without being transferred to another state. Being a Tamil, working in the State of Tamil Nadu presents a number of advantages to the SIO. Clearly, he would not like to be transferred to another State because things would be different there: people, language, food and so on. To this end, the Collector's proposal to computerize the Welfare Scheme presents an opportunity to the SIO to increase the number of projects by one more in the State where he is posted. This would no doubt improve his personal rating in Delhi. At the same time, this would also justify his continuous stay in the state of Tamil Nadu because he is doing a good job. It is obvious that any other activities on the part of the SIO in this context are not going to bring in any benefits. For example, providing the Collector with more information such as the advantages and/or disadvantages of computerizing the Welfare Scheme or proposing a feasibility study to understand the socio, economic and technical impacts of the new system and so on. In fact, it can only delay the project. Sometimes it can

even lead the way to abandon the project. Hence, there was no need to sit over the proposal. The result was an immediate agreement to go ahead with the project. As already pointed out, the more the number of computers installed, the better it is for the NIC. In this instant, the NIC can proudly say that it has now designed a computer-based information system for the District Collector of Chennai to administer the Social Welfare Scheme. The comment made by the SIO in this context should be noted:

*“... ..the NIC expects me to do my work... I have to ensure that state and district governments use computers to do their business... The NIC is happy with my performance.....”*

Similar phenomenon is evident even in the case of the DIO. The district informatics officer, though this particular job title suggests a strategic post, he is actually at the very lower end of the professional ladder of the NIC. The DIO is just beginning his career. Getting a job with the NIC was a very difficult task. Now that he is with the NIC, he has to make every effort to reach to the top of his profession. However, posted in the district of Chennai, where the SIO himself is stationed, the DIO cannot do anything innovative. He is under the direct supervision of the SIO most of the time and has to act according to his instructions. He has to maintain good relationships with the SIO simply because his career depends on how good he is with his SIO. On the other hand, the SIO has his own agenda when it comes to implementing information systems. Under these circumstances, the activities of the DIO are obviously constrained by the intentions and activities of the SIO as well as by the NIC's style of assessment. Accordingly, the DIO commented:

*“.....all what I want is to be a good-boy to the SIO.....”*

Although it has been argued so far that the contextual conditions created by the way the NIC assesses the performance of system designers is one of the most important factors that constrain the activities of system designers, there are other equally important conditions too. The way the NIC approach central government projects as opposed to state government projects can be suggested to be another important contextual condition that constrains the activities of system designers.

To this end, the NIC's need to maintain continuous good relations with different governments in the center has already been discussed. To achieve this, the NIC appears to be adopting different strategies. One of them is obviously the way the NIC approach central government projects as opposed to state government projects. While it takes a more cautious approach towards implementing central government projects and delegate more experienced and qualified personnel to design systems, junior staffs with less experience are delegated to implement state government projects. However, on the other hand, this particular strategy of the NIC influences the activities of its senior executives, which in turn have adverse effects on systems that have been implemented within state and district governments. For example, comparing a particular activity of the SIO in relation to the Welfare Scheme and that of the technical director in relation to the Duty Exemption Scheme illustrates this phenomenon.

In the case of the Welfare Scheme, the case study illustrates that the SIO delegated the task of developing the new system to the District Informatics Officer. The DIO is a young person with very little experience. He has just finished his training and assumed duties in the district of Chennai. He has never designed and developed a system on his own before. However, these facts did not pose any problems to the SIO in this context because projects undertaken by the NIC in different States are the main training ground for the junior staff of the NIC. Any mistakes made at this level do not receive much attention at the national level. They do not spoil the image of the NIC. Furthermore, the proposed system concerns a district. The SIO, with his experience knows how genuine (!) are the administrators and political leaders related to the Welfare Scheme. To this end, the NIC can always deliver a system (!) in response to the Collector's proposal, and the DIO is more than qualified to do this job.

However, in the case of the Duty Exemption Scheme, the Technical Director took a more cautious approach than the SIO by suggesting a feasibility study before computerizing the Duty Exemption Scheme. The point to note in this context is that, on the one hand, this project concerns the Central Government. The NIC cannot afford to make any mistakes. It has to offer its best. On the other hand, this is happening in Delhi. A number of competitors are watching the performance of the NIC. Subsequently, the NIC is compelled to draw a line between state government projects and central government projects. To this end, one of the

senior executives of the NIC remarked:

*“...these State projects are actually a nuisance....we are simply wasting our time with the States...nothing is going to happen by giving computers to State governments....We have to be very careful in Delhi.....”*

As already discussed in chapter five, system designers are primarily computer scientists. There is no doubt that they know very well how computers work. However, their IS related education/training suggests that they do not have the required knowledge/skills to apply computers within organisations. To this end, the IS literature suggest that those who design and deliver information systems should be provided with appropriate IS related knowledge/skills so that, during the stage of project initiation they can listen to the requirements of the users, respond to the questions of users and provide more information, devise alternatives, help users select between alternatives and so on. While there is no doubt that all such abilities are required or desired abilities of IS professionals, the usefulness of all these abilities in the context of the public administration in India appears to be a controversial issue. The contextual conditions appear to be so powerful and complex, that competencies of system designers tend to become a trivial issue.

- **The style of administration.**
- **The environment of corruption.**

It was pointed out in chapter five that the Indian society has always remained a stratified social system in one form or another. It is but natural that in a stratified social system, bureaucratic organisations also tend to acquire a caste-like structure. Within this structure, status consciousness becomes an inevitable phenomenon. On the other hand, barriers of communication between the higher and lower bureaucracy are one of the factors that are affecting the performance of system operators in a number of ways, and the application of information systems is no exception. There is evidence in both case studies to suggest that system operators are not getting actively involved at present in any of those activities associated with the introduction of computers even within their own department. There are a number of reasons for it. Firstly, in today's context, system operators are expected to work within a specified boundary and do whatever they have been asked to do within this

boundary. If there are any problems in this context, then, such problems are considered to be the concern of those who are above in the administrative hierarchy. Consequently, system operators do not go to suggest anything that would be of benefit even to their own work because there are no valid reasons for them to do so in today's context. Secondly, and most importantly, system operators are also aware that even if they suggest anything new, nobody is actually looking forward or interested in any of their suggestions. Consequently, system operators have developed an attitude *'why rock the boat unnecessarily?'*

For example, the clerical staff at the Tahsildar's office had been administering the welfare scheme as a manual system for almost thirty years. Similarly, the Dealing hands had been issuing import licences using a paper-based system for a significant period. No doubt, they faced a number of administrative problems during this period, and no doubt, some of them were aware of the usefulness of computers in solving these issues. However, none of them approached their superiors with the problems they face in their day-to-day work, and none of them made even any suggestions about computers. Instead, the proposals to introduce computers came from different sources. This happened primarily due to respective staffs' awareness that any such proposal is a waste of time, and nobody would listen to them in these matters. That is the style and nature of the public administration. The comment made by one of the clerical staffs at the Tahsildar's office should be noted in this context:

*"... ..you do not understand the Indian public administration. Everyone is busy their personal work. Why should we suggest anything? We just do our work and get out. You are only asking for unnecessary trouble when you go to do such things... .."*

On the other hand, one of the areas where administrative reforms in India have failed to work is corruption. The point to be noted in this context is that it is difficult today to understand whether civil servants are demanding illegal gratification due to their growing needs or simply as a habit. At the same time, it is also difficult to say whether the public is bribing the officials on their own to get their work done or the officials are demanding money from the public to do a particular job. However, either way, for a large number of common items of work done by public functionaries, the amount of illegal gratification has been standardized today in many parts of the country. This is common in those areas of government activity involving large number of transactions.



Furthermore, in most cases, where large sums are involved, important members who are associated with it have close ties with influential politicians. Consequently, it becomes impossible to combat corruption. Corruption, then, affects the activities of a number of organizational members during the application of information systems. The performance of both Dealing Hands at the Office of the DGFT, and the clerical staffs at the Tahsildar's office during the stage of systems analysis illustrate this phenomenon.

In the case of the Duty Exemption Scheme, the system analyst had to move from one table to another, desperately following a piece of document in order to understand the manual system. This happened because Dealing Hands were not willing to provide information to the systems analyst about the manual system. It can be argued in this context that Dealing Hands were primarily concerned about their earnings, which they were making through illegal gratification, and with computers in place, such a thing may not be possible. The comment made by the analyst confirms this:

*".....I knew exactly why they were not very happy with me. The whole office is corrupted. Even if someone is honest, the business people will somehow or other makes them corrupt. This is one of the biggest problems in India....."*

In a Metropolitan City like Chennai, where the cost of living has reached prohibitive levels today, life is nothing, but sorting out economic problems primarily, especially for Government employees at the operational level, and Dealing Hands are no exception. One of the Dealing Hands remarked:

*"...we are the people who do all the work in this office .. the others are there just to find fault in our work .. at the end of the day what we get as salaries is not enough to pay even our house rent ..."*

The case study illustrates the amount, and type of work done by Dealing Hands when the manual system was in operation. In fact, this group made the highest and original contribution to the issue of licences when the manual system was in operation. Well-documented rules were in place for the issue of licences, and the Dealing Hands were no doubt working according to those rules. This includes various checks, controls, and

procedures. Nobody could have formally accused the Dealing Hands during that period for the delays in issuing licences because nobody could formally instruct them to overlook these procedures and tasks.

However, on the other hand, when traders approached Dealing Hands individually to accelerate the processing of their own applications, Dealing Hands were aware of different ways of accelerating the process, yet within the framework of rules and regulations. According to them, such acts did not harm anybody, and they were working to the benefit of both parties. Both parties did not see any valid reasons why they should not be acting in this manner because everybody is doing similar things almost everywhere within the public administration. In addition to such direct approaches by traders, working closely with Controllers brought them additional gratification. Dealing Hands accelerated the processing of a particular application whenever Controllers requested them informally. It was a kind of give-and-take. Again, everybody involved benefited in the end. Under these circumstances, the majority of Dealing Hands considered the Duty Exemption Scheme as a very good scheme at the time of its introduction. Unlike the Welfare Scheme, which concerns old pensioners, this Scheme concerns the rich trading community. Almost everyone in this community is corrupted and this would no doubt bring Dealing hands considerable amount of illegal gratification. It should be emphasised at this point that this simply does not mean that every Dealing Hand in the Office of the DGFT is corrupted. There are few, who like to stand by their moral and ethical values. However, unfortunately, as discussed in chapter five, their number is very low and they are more or less voiceless. In an environment where corruption is a norm, trying to go against the majority can only bring significant damage. Such members tend to either follow the crowd, or mind their own business.

Under these circumstances, the news that the Office of the DGFT was going to introduce computers to administer the Duty Exemption Scheme, followed by the arrival of the NIC Unit to the building came as a shock to Dealing Hands. Obviously, they were very upset and worried. This is not because of any fear of redundancy or any such issues. Rather, it is due to the stories that they have heard from their colleagues who are working in other Government Departments - stories about the changes that computers can bring in work practices.

As revealed by the systems analyst in the case study, every Controller, and Dealing Hands working under him, had their own method of processing applications when the manual system was in operation - yet within the framework of rules and regulations. Their own unique method of processing created an informal environment. Within this informal environment, they were able to manipulate matters to their advantage, keeping those issues as secrets wherever necessary. However, there was no guarantee that they would be able to continue with these methods with computers in place. As pointed out earlier, their colleagues have mentioned these issues, and some of them have read in the newspapers too.

In this context, the hostile attitude of Dealing Hands towards the system analyst should not surprise anyone. The proposed system was a threat to their survival. At the same time, they are also aware that cannot prevent the new system from becoming operational. Consequently, the only alternative available for them was non co-operation. This obviously made the systems analyst to move from one table to another, desperately following a piece of document.

In the case of the Welfare Scheme however, work related to this particular scheme was a problem to almost everyone in the Tahsildar's office. In fact, it was a nuisance. On one hand, it was not giving any kind of income or benefit to any one of them, and on the other, it involved more work – manual writing of money orders and processing of applications. As pointed out by the DIO in the case study, the Tahsildar's office is one of the most corrupted offices in India. Practically, everybody demands money to do any type of work. The staffs have become so used to illegal gratification that it is impossible today to get them work for a genuine cause. Under these circumstances, the clerical staffs were obviously pleased with the news of computerisation. Furthermore, the staffs also knew that the proposed system was not going to make anyone of them redundant. It cannot happen in Tamil Nadu. The politicians will not allow that to happen. There was no need for them to worry about anything in this context. Therefore, they provided every possible information about their work practices related to the Welfare Scheme enthusiastically and willingly to the DIO. This no doubt made DIO's work easier. It must be noted in this context that their willingness to impart a good amount of sensitive and informal information about the scheme rose out of socio-political factors. It was a kind of gossip and they enjoyed it. The DIO commented:

*“... ..most of the staffs do not like the Welfare Scheme. For that matter, they do not like anything that does not give them extra money... ..they were telling me a lot of stories ... stories to put other people in trouble ... ..”*

The IS literature suggest that those who operate and use information systems should have the ability to suggest application areas and initiate study, describe existing procedures and define information needs, help evaluate existing system and select appropriate alternative, and so on during the stages of project initiation and systems analysis. In order to demonstrate these abilities, no doubt that these members should be provided with appropriate information systems related knowledge/skills. However, in the case of the Indian public administration, although information systems related knowledge/skills of system operators can be declared as non-existent, one is bound to ask the question `What is there to be achieved by providing IS related knowledge/skills to system operators in today's context?`

- **The ambiguous role of the NIC**

Today, the Government of India declares through the Gazette that the Indian public administration should utilise the services of the NIC when introducing computer-based information systems within user departments. While user departments are expected to pay for the hardware and software, the NIC is expected to provide the expertise in terms of their staff. The point to be noted in this context is that, as already pointed out, the NIC is not a statutory organisation. Even some of the latest Gazette notifications have failed to spell out the exact role of the NIC in more clear terms. In a predominantly bureaucratic environment, the ambiguous role of the NIC causes much confusion. For example, system designers, being employees of the NIC, are not sure of their own role during the process of systems development. Implicit in this confusion remains the fact that system designers cannot make any changes to current work practices. It should be noted in this context that many of the current work practices that are being adopted within the public administration are based on well-defined rules. Furthermore, these practices have been designed for regulatory and control work rather than for participative and development work. System initiators primarily designed them. Making changes to these practices is not an easy task. It would involve debating some of the issues in parliament, which involves considerable amount of work for

both system initiators and their political bosses. Furthermore, once initiated, it takes time. On the other hand, system initiators stay in particular positions only for a limited period. There is no guarantee that the next person and his/her political boss would continue the work along the same line, in case the work was not completed during a particular period. Such rigidities related to current work practices combined with the ambiguous role of system designers, then, affects the performance of both system initiators and system designers during the process of systems development. Obviously, this affects the effectiveness of the final information system.

To this end, when system designers are asked to design information systems in today's context, there is a strong tendency for them to take a bottom-up approach, and automate some of the well-defined and structured practices, freezing many significant issues at various points. Obviously, such issues are fuzzy in nature. Addressing these issues would involve fundamental changes to existing organisational and socio-political structures. It is primarily the job of system initiators. In today's context, system designers can never make changes in these practices. Under these circumstances, when analysing existing systems with an aim to design new information systems, system designers are obviously concerned only about well-defined procedures within the existing system. They use only tools and techniques that are used to document structured procedures. For example, flow-charts and structure-charts. The case studies suggest that although they listen to the informal aspects of existing systems, they do not document any of them.

Once the current system is documented, then system designers go to decide on the type of software that is best suited to the given business problem - for example, spreadsheet, database management systems and so on. Using the software, system designers automate some of the structured procedures taking place at the operational level. Once transactions taking place at the operational level are automated, then system designers are in a position to provide most of the information requirements of system initiators. It primarily involves grouping and reporting transactions. At this point, system designers usually incorporate a number of additional features in the new system, which they think would be useful to the users. These features are usually available as ready-made functions in today's application packages. However, at the end of the day, such practices of system designers result in

information systems that can only function within a limited system boundary, performing few trivial tasks, with many of its features remaining unused. Both case studies illustrate this phenomenon very clearly.

In the case of the Welfare Scheme, the case study illustrates that the DIO was asked to design and deliver the new information system under certain conditions, which were in fact implicitly pre-defined:

- The inauguration date for the new information system was fixed in advance to coincide with the Minister's visit. The DIO has to deliver the new information system before that particular date. This is something that the DIO cannot ignore. On one hand, meeting the deadline has serious implications to his career, and while on the other, there are too many big people involved - the SIO, the Collector, the Minister, and many others. Being an Indian, and having been educated and socialised in that environment, the DIO is well aware of the kinds of political stunts, and subsequent benefits gained by related members. In such an environment, he has to act appropriately. He is too small to challenge such matters.
- The new information system that he was going to design was to be placed and operated within the Information Technology Unit of the NIC. The hardware and software platforms were already there, which implies that the new system would operate on this platform only.
- The DIO was under the direct supervision of the SIO most of the time, which implies that he has to act according to his instructions on important issues. To this end, the SIO has already told him to document only some of the well-defined procedures related to the Welfare Scheme.

It is under these circumstances that the DIO started the stage of systems analysis at the Tahsildar's office by looking at the manual functions and procedures concerning the Welfare Scheme. The case study illustrates that during this process, the DIO was only concerned about the rules and formal work practices related to the Welfare Scheme. He used only those tools and techniques that are usually used to document formal procedures - for example, flow charts and structure charts. Although he listened to the clerical staff who informed

him about a number of informal aspects related to the Scheme, he simply did not document anyone them. For example, the DIO remarked:

*“...they were telling me a lot of stories ... although some of them were relevant to my study, I simply did not document anyone of them... I do not know how to document them ....”*

When the DIO reported his analytical findings to the SIO, there was nothing new in it for the SIO. In fact, he was only looking for a few well-defined procedures. He knows well that socio-political factors always cause the majority of problems to all government schemes. At the same time, there is always one area within every scheme, where computers find their place with minimum efforts. The rest of the area is fuzzy in nature - for example, trying to address the problems related to the initial processing of applications. This area is characterised by a number of irregularities such as queue jumping, interference of politicians, fiddling with information that are stated in the application forms and so on. Addressing these issues is well beyond the capacity of the staff of the NIC. On the one hand, attempting to address these issues would not take them anywhere, and on the other hand, they need the support of top people if they are to address these issues, which is almost impossible in today's context. The SIO's remark should be noted in this context:

*“...I have read a lot about your theory that of information systems ... such things will not work in India .. we have a long way to go ..”*

Under these circumstances, the SIO conveniently marked the boundary of the proposed system to incorporate only the small area where computers can find their place with minimum effort. Once the system boundary was determined, and the basic data model was created, then the SIO had trust in the DIO's programming capabilities. Furthermore, the SIO knew that the DIO would do the job to the best of his abilities because he is expecting his promotion. The limited system boundary prompts the SIO to incorporate into the new system only those attributes of each entity, which are necessary to perform routine, essential operations.

Under these circumstances, it can be argued that neither the DIO nor the SIO has many alternatives. This is a project concerning the district government. Different people have different motives for computerising this project. Some of them are obviously powerful. Amongst this group, the role of the NIC is ambiguous. It has no formal powers. Therefore, the NIC can never develop a perfect system that would solve every single problem that is related to the welfare scheme. Hence, what is the point in wasting time in documenting those fuzzy areas of the system? The best possible option is to automate some of the well-defined procedures which have no controversies attached to them.

The point to be noted here is that even when the Collector was informed about the proposed system, she also did not make any effort to broaden the system boundary. To this end, it can be suggested that even the Collector is well aware that addressing those issues within the fuzzy domain would involve considerable amount of work. At the same time, there is no guarantee that the Collector would succeed because of its political dimension. Clearly, any attempt to do so can only delay the project or even pave the way to abandon it. Under these circumstances, the Collector simply acknowledged the new information system, which is primarily a computer system to print money orders.

On the other hand, as opposed to the SIO, the systems analyst associated with the Duty Exemption Scheme was able to bring every single activity related to the issue of licences within the system boundary. This happened primarily because he had the support of the top people: the DGFT, the Minister of Trade, the NIC (Head Office), and so on. The case study illustrates that unlike the Welfare Scheme, the analyst started the project by briefly looking into the technical feasibility of the proposed system. This simply involved studying the required hardware, software and communications. According to the analyst, there was no point in wasting time in studying the economic or social impacts of the proposed system. The people at the top have already decided to go ahead with the project. The DGFT and the NIC have shown the green signal to proceed with the work. Therefore, worrying about socio-economic impacts of the proposed system was not going to be of help to anybody. Furthermore, nobody was interested in such issues.

The analyst had already received informal instructions from the NIC (Head Office) to



automate every possible task related to the issue of Licences. Furthermore, the DGFT has also briefed his information requirements. The analyst had a reasonable understanding of the manual system, which according to the case study, was obtained in a similar way to that of the DIO. Under these circumstances, the stage of systems design presented very little problems to the analyst. This should not surprise anyone when one considers the technological capabilities of the analyst. The comment made by the system analyst in this context should be noted:

*“ ... You see, I had the support of every big person.. I was determined to study the manual system by any means... because after that, it is my job ... ”*

The case study illustrates that the analyst had prototyped some of the applications and there by involved the users in the process of system design. However, the intentions of the analyst suggest that this happened not because the analyst genuinely wanted to involve the users in the process of system design. Rather, he wanted to ensure that he was on the right path, and that he had rightly understood the existing system. By placing himself in the users' world, and at the same time using his technological knowledge, the analyst came out with the final information system. Today, according to the analyst, the new information system has every feature that is required to make the office of the DGFT effective and efficient, but unfortunately, many of the features remain unused.

It can be argued that this is primarily because today, system operators and system managers are of the view that there is nothing wrong with the manual system with which they are familiar. According to them, what is required is a complete reorganisation in current work practices, and this does not necessarily mean computers. They argue that the central government is simply playing politics. According to them, the issue of computerisation is used conveniently by the central government to avoid any serious examination of a number of important problems. The comment made by one of the Controllers should be noted:

*“...there is nothing wrong with the present system... all what we need is more staff... the government does not want to increase the number of staff.. it is all politics...”*

At the same time, system operators and system managers see the NIC as an agent of the

central government. They feel that the central government is trying to impose a number of things on them through the NIC in the name of computerisation, with an intention of closely monitoring and controlling their activities. Consequently, they are suspicious of anything that the NIC suggests. They try to reorganise everything at the end that has been suggested by the NIC. This phenomenon is evident from the activities of both system operators and system managers, especially during the stage of system operation.

In the case of the Duty Exemption Scheme, the case study illustrates the changing attitudes of system operators. Their hostile attitude during the stage of systems analysis have in fact changed significantly during the stage of systems design. This is because they began to understand the proposed system at least in an elementary way during the stage of systems design. This was facilitated by the progress in work and through different screens, which they were able to see and operate. The system analyst remarked:

*“...the Dealing Hands were very happy to see snapshots of the new system....they never expected such things ...they were able to see that their work is going to be easy...”*

The more they came to know about the proposed system the more they were getting confident and interested. After all, things were not going to be as bad as they thought. On one hand, every one of them was aware that the proposed system was going to make their work much easier, and on the other, they were still going to be in command at the lower end. In addition, they were very pleased to note that neither the Controllers nor the DDGFTs were showing any kind of interest in the new system. This simply meant that there was nothing to worry about. The new system would never work.

When the new system became operational, the systems analyst, being the architect of the new system, suggested new work practises that are appropriate for the issue of licences. However, both Dealing hands and Controllers were not very pleased about these practices. Now that they knew the system, they wanted to layout their own method of working. Furthermore, they simply did not like the idea of the NIC telling them how to work. No doubt, they were suspicious about those practices too. This attitude resulted in Dealing Hands adopting different delaying techniques – they started to blame the computers for

everything. There was nobody in the office to crosscheck these claims. This resulted in considerable amount of backlog during a short period of time, which in turn brought complete chaos. Consequently, the JDGFT came under pressure from different sources to bring the situation to normal. Under these circumstances, there was no other alternative other than to change those work practices suggested by the systems analyst, and work out new procedures, which would be acceptable to both Dealing Hands and Controllers. The result is the parallel running of two systems.

However, on the other hand, the staffs who are coming from the Tahsildar's office to the Collector's office to carry out necessary work related to the Welfare Scheme have a positive attitude towards the new information system. This is essentially because writing money orders manually without any benefits was something that every one of them did hate. The present system relieves them of this monotonous work and at the same time gives them the chance to work with computers.

On the other hand, the IS literature suggest that those who design and deliver information systems should be provided with appropriate information systems related knowledge/skills so that during the stages of systems analysis and systems design they can conduct a complete analysis of the manual system, present alternatives and trade-offs to users to their decisions, combine users' needs with technical requirements and so on. On the other hand, it is suggested that those who use and operate information systems should be able to help describe existing system, review specifications, generate test data, review results and so on. However, the foregoing analysis on the activities of system designers and system operators during the stages analysis and system design suggest that they have functioned in compartments and together they have missed some of the crucial aims of information systems. During this process, the usefulness of their information systems related knowledge/skills appear to be a trivial issue.

- **The nature of system initiators' job**

India constitutionally entrenched the practice of central recruitment of all-India services, which is common to both central and state government with ultimate control vested in the center. Since IAS officers are general administrators, they are found managing all

sort of things. In addition to their busy schedule, their political bosses frequently summon system initiators at short notices to different meetings. This often makes them unable to attend to even to their own routine responsibilities. Consequently, in today's context, system initiators are unable to show continuous commitment and support even to the projects that have been initiated by them for computerization, primarily due to the nature of their work.

On the other hand however, system designers' first formal contact within user department is system initiators. At the time of initiating new projects for computerization, system initiators usually define their requirements very ambiguously. However, when the actual system development is in progress, system designers for further consultation cannot easily approach system initiators. This is either due to the busy schedule of system initiators, or sometimes system initiators simply avoid system designers for a number of reasons.

The point to be noted in this context is that being general administrators, system initiators are not only expected to manage a variety of things, but are also transferred periodically to a variety of departments. However, the ways system initiators are transferred from one office to another and the consequent absence of sense of accountability among senior administrators has always remained a controversial issue within the Indian public administration. To this end, it can be argued that there are no compelling reasons in today's context for system initiators to ensure that the projects initiated by them for computerization are completed successfully.

Under these circumstances, system designers, who has no clear definition of their own role, are working on their own most of the time, making their own assumptions about the requirements of users. However, when information systems designed in this manner become operational, system initiators frequently complain that the new information systems do not provide them with anything useful. The nature of system initiators' job, then, constrains the activities of both system initiators and system designers during information systems application. Both case studies illustrate this phenomenon very clearly.

In the case of the Welfare Scheme, it was pointed out by the SIO that the Collector did not state her information requirements very clearly at the time of proposing the project. On the other hand, it was practically impossible for the DIO to find the Collector during the process of systems development although he tried hard to find out her information requirements on a number of occasions. The point to note in this context is that, as far as the Collector is concerned, her proposal to computerize the welfare scheme has been accepted by the NIC. The Collector knows that the work would progress without delay because the inauguration date has been fixed. The NIC knows its responsibilities. Therefore, now it becomes the responsibility of the NIC to find her. The busy schedule of the Collector does not permit her to worry about other issues. Furthermore, she has initiated the project. That has already gone in records. There are no compelling reasons for her to ensure that everything is progressing smoothly. It is something that should worry the NIC. In fact, it was the DIO who was very much concerned about finishing the project in time. Under these circumstances, both the DIO and the SIO designed a system, which they thought would be useful to the users, including the Collector. However, today, the Collector claims that it does not have any useful features, and that it is a nuisance. Accordingly, the Collector remarked:

*“...I don't think that this system has done anything useful ... it is a nuisance”*

Similarly, even in the case of the Duty Exemption Scheme, the JDGFT was not available for consultation during the process of systems development. As far as the JDGFT was concerned, the decision to introduce computers was taken in Delhi by the DGFT - system requirements were defined by the DGFT himself - the NIC is developing the system – both the DGFT and the NIC are communicating directly. Under these circumstances, why should he involve himself unnecessarily? Therefore, he kept away from the analyst most of the time, letting the others to sort out matters on their own. The comment made by the analyst should be noted:

*“ ... the JDGFT did not like the NIC communicating directly to the DGFT...”*

Under these circumstances, the analyst had very little options. According to him, practically everyone working in the Office of the DGFT was ignorant of computers, which made communication difficult in terms of finding their requirements in relation to the new information system. Such setbacks, combined with the indifferent attitude of most staffs, prompted the analyst to work on his own most of the time. By placing himself in the users' world, the system analyst designed the final system with a number of features, which he thought would be useful to the users. However, today, a number of users, including the people at the top, blame the new information system for not providing them with anything useful.

- **The NIC's expectations**

The NIC has come a long way since its earlier days. It has grown in all directions, and during this period has become more complex. Today, it is represented in all regions, states and districts. Its present strength is over 3000 persons. However, on the other hand, the very growth of the NIC itself appears to have given a birth to a number of problems, especially problems related to personnel management. Today, more and more government departments are approaching the NIC with new projects, and at the same time, the NIC has to maintain all those systems that are up and running. Nevertheless, the NIC appears to be concerned more about building new systems rather than maintaining systems that are already up and running. Consequently, system designers are compelled to take a sideline when it comes to enhancing systems that are already up and running. This results in system initiators accusing system designers for not attending to some of the most important changes that are required in the current system. For example, the Collector remarked:

*“... .. The NIC has no time to improve the present system. They are always busy with new systems... ..”*

Accordingly, whenever someone reports any problem with the new information system related to the welfare scheme, the DIO does the bare minimum to keep the system operational. According to the DIO, the Welfare Scheme is a nuisance. As far as he is concerned, he has completed his work by delivering the system and making the system up and running. Now it is the responsibility of the Collector's office to ensure the smooth

operation of the system. Instead, he is being bothered continuously. Firstly, the staffs from the Tahsildar's office approach him frequently with a number of problems, which are trivial most of the time. Although he is aware that this is due to the quality of training provided to them, he simply cannot do anything about it now because he cannot afford to waste time with them. There are other projects lined up for him, which are more important to him from his own point of view. Secondly, the Collector blames the DIO whenever things go wrong with work related to the Welfare Scheme. This is something that the DIO is unable to understand. Who is the owner of the new information system? On one hand, his boss – the SIO – expects him to work on new projects, and while on the other, the Collector expects him to maintain the old system. The DIO remarked:

*“....I cannot understand this..... I am very busy..... I do not have any time to waste with the Welfare Scheme..... My boss will not accept this maintenance work ....”*

Even in the case of the Duty Exemption Scheme, it was only when the new system became operational that the analyst realized that it was not working the way it was intended to be working. He also realized that suddenly he had become the owner of the new system. Nobody in the office of the DGFT wanted to associate him or herself with the new system. Furthermore, the analyst found himself in a situation where he was carrying out a variety of tasks related to the issue of licenses. It is in this context that the analyst decided to start his new project, leaving the office of the DGFT to sort out its own matters, although he personally felt that the users were still not ready to work with the new system.

- **The socio-political environment**

An organisation like the Indian public administration, which is predominantly political, calls its important members to engage themselves in activities aimed at gaining publicity through political stunts, and there are different techniques to achieve this. Today, the most affected members are system initiators. The point to be noted in this context is that these activities have become almost a norm in today's context and system initiators have become to be recognised by their political bosses through such acts. In fact, those who do not engage themselves in such activities are only causing obstacles to their own career. However, such

activities of system initiators affect a number of people within and outside the public administration, and beneficiaries of information systems are no exception. For example, some of the operational procedures were made by the collector to make the new information system related to the Welfare Scheme up and running. This includes who is to come from the Tahsildar's office to work in the Collector's office, when they should come, what they should do and so on. All these issues were well within the administrative capacity of the Collector. In this context, it did not require any major negotiation process. Furthermore, everyone accepted the new arrangements mainly because those arrangements did not cause any major changes in their work practices. On the other hand, a number of other important operational procedures were not arranged with careful thought and care to ensure the smooth running of the system continuously. In fact, some of the arrangements were made in a hurry, just to make the system up and running on a particular day – the inauguration day by the Minister. As far as the Collector is concerned, keeping the image with the Minister is more important than spending time with procedural arrangements. Furthermore, according to the Collector, the NIC developed the system. It is their responsibility to keep the system going smoothly. On the other hand, such controversies related to the information system have created inconvenience to pensioners on a number of occasions. When such issues surface, the Collector feels that the computer system is a nuisance.

- **Subjectivity**

It was pointed out in chapter two that subjectivity refers to the way we experience and make sense of ourselves and our world. That is, subjectivity concerns our sense of identity and belonging. The very idea of what it is to be a particular sort or category of person from the inside as well as in relation to others very often closes some avenues of action, thought and behaviour and opening up others. Subjectivity, then, is one of the most important factors that determine our performance in a particular environment, and organizational members associated with the application of information systems are no exception to this phenomenon. However, it can be suggested that the higher is an individual's position in the organisational hierarchy the more evident is this phenomenon.

So, for example, it can be argued that the most affected members by subjectivity are the IAS



officers. The point to be noted in this context is that the former Indian Civil Service, which had been staffed mainly by British officers, was replaced by a new all-India service. In the course of fifty years of independence, the Indian Administrative Service (IAS) has emerged as the elite corps who staffs key positions close to the President and the Prime Minister as well as the other highest level positions. In fact, IAS officers are the elite of India's elite. However, it appears that the values set by the British continue to guide the IAS even after independence, and there is no radical departure in their behaviour from pre-independence norms. Therefore, the very idea of being an IAS officer carries with it particular ways of thinking and acting. In fact, it can be argued that such norms are explicitly re-emphasised in a stratified social system, where the status consciousness is very significant. However, such conditions that go to structure the identity of IAS officers compel them to act in particular ways and prevent them from carrying out certain activities. Examples can be found in both case studies:

In the case of the Welfare Scheme, the DIO has repeatedly stated that he could not obtain the information requirements of the Collector simply because it was practically impossible to find the Collector during the stage of system development. There is no doubt that this affected the effectiveness of the final information system. However, it can be argued that if someone can easily find the Collector, then he or she cannot be recognised as a Collector in today's context. Every Collector has to ensure that he or she is not easily available for consultations – just to preserve the image of a Collector. The remark made by the DIO should be noted:

*“.....these IAS officers think they are the saviours of India. Sometimes they just pretend to be busy – just to show that they are big people... ..”*

Furthermore, the case study illustrates that the DRS Tahsildar was not consulted by the Collector in any of those matters related to the computerisation of the Welfare Scheme. Again, this affected the quality of the final information system. To this end, it can be argued that the position of a Collector in today's context does not permit any kind of consultations. IAS officers are only used to issue orders – not to consult. It is important to note that although the IS literature suggest participative systems development as a measure of implementing effective information systems - such ideas become impossible to implement by conditions created by subjectivity.

On the other hand, in the case of the Duty Exemption Scheme, the DGFT is a very senior IAS officer with more than twenty years experience in public administration. His present position in the administrative hierarchy, which is the ambition of every young IAS officer, is one of the highest and prestigious positions within the public administration. Unlike the young Collector, who has to prove her performance, the DGFT need not prove his performance – he is already at the peak of his career. However, the very fact that he is at the peak of his career compels him to act in particular ways. The point to be noted in this context is that even a senior officer like the DGFT is compelled to accept certain conditions and carry out particular activities because of the conditions created by subjectivity. It becomes extremely difficult in this context to take alternative courses of actions.

### **8.3. Concluding Reflections**

Information systems are developed and used within the context of a specific organisation. Although the success and failures of information systems depend to some extent on the competency of individuals associated with the development and use of information systems, competent individuals cannot be bracketed off from organisational life. Consequently, the political, social and cultural backgrounds of organisations often affect the performance of competent individuals. Viewing organisations as political systems encourages us to see organisations as loose networks of people with divergent interests who gather together for the sake of expediency. Organisational politics is about the pursuit of self-interest or the pursuit of functional managerial interest in opposition to organisational goals. Organisational politics gives rise to certain conditions of possibility, that is, a number of micro and macro environmental conditions that make certain courses of action feasible while constraining or ruling out others. The point to be noted in this context is that none of these context specific environmental conditions is objective. Rather, they are socially constructed and this process takes place through the contextually specific process of organisational politics. For example, some of the macro conditions such as socio-economic and socio-political conditions do not have an existence separate from the individuals or groups who constitute them. Rather, they are created and shaped by particular individuals and groups. However, a different set of individuals move into these conditions and confront them as a given reality. It may be

possible to make small changes, but continuous survival will involve accepting the existing conditions. What is important in this context is that the process of organisational politics is crucial to the development and deployment of information systems and cannot therefore be excluded in accounting of the development of information systems. In the context of the current study, organisational politics appears to be giving rise to the following macro and micro environmental conditions, which constrain the performance of both competent and non-competent individuals:

- The Central Government's overall control over the States and the subsequent dependency of States on the Centre.
- The State Government's overall control over the Districts and the subsequent dependency of Districts on States.
- The career of senior civil servants depending on politicians and the subsequent need of these officers to please their political bosses.
- The NIC's need to demonstrate its indispensability and the subsequent strategies adopted by the NIC to achieve this.
- The failure of the Government of India to define the exact role of the National Informatics Centre in more clear terms.
- The present structure of the public administration and the implicit caste-dimension attached to this structure.
- The absence of an IS strategy within the public administration.
- The background of current work practices and difficulties involved in changing these work practices in today's environment.
- The way IAS officers are transferred from one department to another and the issue of accountability.
- The importance given to the all-India services by the Government of India
- The importance given to certain projects by politicians for personal reasons.
- The overall attitudes of the common man about civil servants.

This long list suggests that the very issues that India has been trying to address through successive administrative reforms for fifty years turn out to be the same issues today that constrain even the successful application of information systems. The point to be noted in this

context is that, today, India claims that computers are being introduced within the public administration as a part of administrative reform. However, there is no doubt that such efforts have achieved only a limited amount of success, the reasons for which have been analysed and presented in this chapter. Under these circumstances, one is bound to get confused whether computers are of any help in bringing about administrative reforms or administrative reforms should be in place before computers can be of any help to the public administration. For example, it is generally agreed that computers can bring more openness in the work environment and that more openness in the work environment means less corruption. To this end, it was pointed out in chapter five that one of the areas where administrative reforms have failed is corruption. Today, some of the strategies of the Government of India no doubt aim to tackle this issue through computers. Unfortunately, during the process of implementing information systems, the very environment of corruption constrains the activities of different individuals who are associated with its implementation, which in turn result in incomplete and ineffective information systems.

Under these circumstances, it can be argued that if those contextual conditions that we witness in today's environment have been constituted by human actions in the first place, then they also have to be reconstituted by human actions. It should be noted that the philosophy of contextualist analysis suggests that changes in the context make processes emerge, and these processes in turn influence the context. In fact, the linkage between context and process has received significant attention in the information systems research (Walsham, 1993). To this end, learning is a process that is closely related to human actions. Psychologists claim that *learning* is their central concern because their main focus is on the behaviour of an individual in his environment. In order to understand the influence of learning on human actions, it may be necessary to understand what exactly is learning. Learning involves change. It is concerned with the acquisition of habits, knowledge, and attitudes. It enables the individual to make both personal and social adjustment (Crow and Crow, 1963). The concept of change is inherent in the concept of learning. The theories of learning fall under a number of categories and these theories give rise to a variety of choices (Angadi, 1993). Some experts advocate one set of theory for education and another set of theory for training. Fundamentally, education focuses on the ability to reason abstractly (Nelson 1991). Training, on the other hand, provide the ability to work concretely (Manpower Services

Commission, 1981).

What becomes evident from this discussion is a reminder that behaviour of individuals can be changed through appropriate education and training. At the same time, it is evident from the current study that information systems related education/training programmes as they are conducted today has very limited role to play in today's context. This is because such programmes as conducted at present are not free from weakness and shortcomings. For example, system initiators play, and would continue to play a strategic role in the application of information systems within the public administration. Therefore, the success and failures of different projects of computerisation within the public administration would also continue to depend largely on the capabilities of system initiators. At the same time, system initiators are one of the most important groups of people who can make changes to the existing conditions within the Indian public administration. Under these circumstances, system initiators should be provided with appropriate knowledge/skills in order to understand the context in which information systems and their related technologies were born, nurtured, evolved, and the consequent socio-cultural, organisational and economic changes brought about by their widespread application. At the same time, they should also be made aware of some of the limitations of computer-based information systems. This would enable them to understand that effective and efficient application of information systems within the public administration would require significant changes in current work practices and other related organisational structure/functions. In addition, system initiators should also be made aware of the socio-political dimension of information systems so that they become aware of all the implications arising from the introduction of computer based information systems.

On the other hand, in an environment where computer-based information systems are just beginning to appear, the majority of users associated with its application would naturally possess relatively poor knowledge/skills about information systems. Under these circumstances, systems designers, who have a fair amount of knowledge/skills about computer-based information systems, at least in a technological sense, have a greater responsibility to shoulder. There is a need for them to transcend their present role of simple technological solution providers to that of designers who design and deliver information systems appropriate to their national context. In order to achieve this, the first prerequisite is

to provide system designers with appropriate knowledge/skills so that they can understand that computer-based information systems and their related products have been developed and evolved in richer countries to serve their specific socio-cultural and economic environment. They must be made aware that most of the software that are imported into their country cannot be applied within the public administration and made to function effectively in a straightforward way. Furthermore, they should understand information systems from its technological, and socio-political dimensions so that they can understand the nature of a problem by all its dimensions, assess the role of information against these dimensions, and then decide on the role of information systems in solving that particular problem. When it comes to the design and development of information systems, system designers should be made aware of the limitations of West-based system development methodologies, associated tools, and techniques in relation to the context in which they are working, so that they can select and use appropriate methods to carry out different tasks.

System operators on the other hand, should be provided with appropriate knowledge/skills so that they can broadly understand the role of information, information requirements of their immediate bosses, why they require it, how it is generated, how it used, how it is handled and so on. Furthermore, they should broadly understand some of the capabilities and limitations of information systems. They should also be provided with appropriate knowledge/skills to operate information systems in place, cope with minor system failures, perform back-up operations, use the application software to perform essential operations, access necessary data that is required for their own work as well as for system initiators.

In addition to all such measures, the indigenous education system has to take a broader view to incorporate local realities. In a country like India where security and belonging and success and belonging are the value systems, where concern for society as a whole is the main criteria, the education system has to consider India's socio-cultural, economic and political realities when designing educational and training programmes. Overall, the current study recommends that before initiating any specific information systems related education/training programmes, the first prerequisite is the identification of the right kind of general education.

In sum, India has had a strong scientific and technological culture. India's performance today suggests that it has the broadest and best developed technological capabilities. Today, the information technology industry can stand up to be counted amongst the industries, which are contributing to growth of the Indian economy. To this end, India's capability in software development is globally recognised. However, on the other hand, adoption of computers and effective use of information systems by the public administration of India has left much to be desired. Although the current study suggests a mismatch between the demand and supply of IT manpower, both quantitatively and qualitatively, it can be argued that such a mismatch could be easily rectified when one considers the existing infrastructure and India's capabilities. On the other hand, the current study makes it clear that conditions created by organisational politics play the most critical role in constraining the performance of competent individuals associated with the development and use of information systems. This implies that unless and otherwise such conditions are addressed, competent individuals cannot demonstrate their performance, which in turn results in ineffective and inefficient development and use of information systems.

The overall implication of the findings is that it is important to realise that information systems development is both rational and political activity. To think otherwise is to be naive and/or ignorant of the way in which organisations function. The naïve actor, who remains unaware of the differences between ritual and reality, will be a less effective participant in the process (Robey and Markus, 1984). Although this may not be familiar territory, especially for those with a technical background, they need to make significant and purposeful efforts to manage the politics associated with the project. They should learn how to play the game of organisational politics. For example, it may be necessary to focus upon who has what power. At the end, how one reacts to this situation will depend upon one's own personality, the brand of politics, which exist in the immediate organisation, and the choices available.

## **CHAPTER NINE**

### **Conclusions**

Computer-based information systems are being implemented increasingly within the public administration of many developing countries with an aim to promote socio-economic development. However, such efforts and investments of many developing countries have achieved only limited amount of success. To this end, performance of different organisational members who are associated with the implementation of information systems has always remained an area without much understanding. The current study was started with an overall aim to increase our understanding of this domain through empirical work. The study has examined two different cases within the public administration of India where significant efforts and investments have been made to introduce computers to administer two different schemes of the Government of India. The study has presented a number of findings and has made some broad recommendations based on these findings. The aim of this chapter is to review the study and its findings in light of its contributions, limitations, future research directions, lessons for other developing countries and so on.

#### **9.1. Contribution of research**

If research is a search to understand the real world, and if the real world is what people perceive it to be, then this research has made a significant contribution. Firstly, information systems are portrayed as an extremely young discipline that has yet to attain recognisable shape. Consequently, it has very few established themes, theory and methods. Descriptive information is considered as one of the critical ingredients for theory building. The current study has systematically described the performance of organisational members who are associated with the application of information systems within the public administration of India in terms of their information systems related knowledge/skills and the environment. This is no doubt is a critical form of knowledge for theory building in the field of information systems for development administration.

Secondly, politics within organisations is identified as a deviant, informal and irrational activity that disrupts the smooth running of organisations and the efficient achievement of



their goals. Information systems implementation within organisations has not been an exception to this phenomenon. The current study has established that political struggle is inescapable within organisations and cannot therefore be excluded in accounting for the development of information systems. Furthermore, in the context of development administration, the intensity of politics and institutionalisation of political processes tend to be much more than in any other context.

Thirdly, by systematically describing the activities of different organisational members who are associated with the application of computer-based information systems within the public administration of a developing country, the study has increased our understanding of a number of issues. For example, it has increased our understanding about the way information systems are developed within the development administration, organisational members who are associated with its development, the activities performed by these members, knowledge/skills possessed by these members, the way the environment constrain the activities of these members, and finally the way all these issues determine the success of information systems. Such detailed understanding is important not only to implement effective information systems in the future, but also to utilise existing information systems in a more effective and efficient manner.

Fourthly, much has been written and prescribed about the importance of information systems related education/training for developing countries in the context of introducing computer-based information systems for socio-economic development. This would no doubt make anyone assume that providing IS related education/training is the key for the successful introduction of information systems in developing countries. This research has demonstrated the limitations of such assumptions, which in turn has serious implications for those national and international organisations that are concerned with the application of computers for socio-economic development.

Finally, the success of the education system in any developing country would depend largely on the appropriateness of knowledge/skills imparted to different individuals, and IS related education/training is no exception. At the same time, knowledge/skills are context dependent. The point to be noted in this context is that the present curriculum in many developing

countries is the outgrowth of similar curriculum in industrialised counties. This research, through empirical work, has described the context, and the performance of individuals within this particular context. This could enable educational/training institutions to design appropriate educational/training programmes.

## **9.2. Limitations of research**

Every research has its own limitations. This is because researchers are humans and that they can only perform within limited boundaries. At the same time, researchers also face a number of constraints probably from every conceivable dimension even within this limited boundary. The current research is no exception for this phenomenon. However, what is important to note is that these limitations should be understood and the findings of the research should be utilised appropriately. Furthermore, future research should be undertaken with lessons learnt from the past.

Firstly, the most obvious limitation of the current research is that it has completely ignored the concept of time and the consequent process of learning associated with time. The activities of different organisational members, their information systems related knowledge/skills, the context within which their actions were interpreted, and the recommendations that followed - they all relate to a particular point of time. Clearly, there is process of learning over a period of time, which no doubt changes the performance of individuals. The current study has very little to offer in this direction. Secondly, organisations are systems of interdependent human beings. People influence others, and get influenced by others. Again, this has serious impacts on the performance organisational members. The current research has treated participants as individual entities, who have no interactions with other participants. Thirdly, the current research is based on the concept that hermeneutic researchers can understand human constructions by immersing themselves in the participant's world. However, the current study has faced a number of practical implications related to this concept. On one hand, it is not always possible to understand every single action of an individual, and while on the other, understanding the actions of a group creates further problems. For example, in the case of the Duty Exemption Scheme, the researcher has tried to understand and interpret the actions of Dealing Hands as a group. However, during this

process, a number of individual issues had to be ignored in an effort to present a collective view of a particular group of members.

Fourthly, one of the methodological issues that is related to the current study is that the background of the researcher. Although the researcher and the people of Tamil Nadu share a common culture, the researcher has been living and studying in the U.K for more than ten years, and his study discipline being information systems. During this period, there have been significant changes in the value system of the researcher, his behaviour and the way he understands the world. This bias obviously created a number of problems during the process of interpretation. For example, some of the issues that were considered as major issues by those organisational members in India appeared to very trivial for the researcher. For example, whenever, the issue of caste cropped up, it was very difficult to give real meaning to the issue and interpret that in an effective manner. Related to this difficulty, is the way the researcher interprets the opinion of a participant concerning other participants. Finally, the current research suggests that in a country like India, the success, and failures of information systems are determined primarily by organisational members who only associate themselves implicitly with the application of information systems - for example, system directors and system managers. However, the current study has nothing substantial to offer in this direction.

### **9.3. Future research**

Some of the limitations of the current research obviously pave the way for future research. For example, the current research has provided the reader with a snapshot of the real world, which relates only to a given point of time. On the other hand, data collected adopting a longitudinal research approach would reveal changing circumstances, perceptions and performance of organisational members over time. This would no doubt provide us with a richer picture of the complex and shifting nature of the context and interpretations of actors within this context. Furthermore, related to the concept longitudinal research is the philosophy of contextualist analysis, which suggests that changes in context make processes emerge, and these processes in turn influence the context. The current study has aimed to suggest positive changes for the future by interpreting the actions of different organisational

members. On the other hand however, by performing a contextualist analysis adopting a longitudinal research, a researcher would be able to systematically study and observe the processes, the context within which these processes have emerged, the outcome, and finally offer positive suggestions, which can make a significant impact.

In a context where the success and failures of information systems are determined largely by organisational members who only associate themselves implicitly with the introduction of computers, some of the frequently adopted research methods have very little value. For example, determining the role of system directors during the process of introducing information systems, and subsequently suggesting positive measures for the future is not an easy task. In fact, the current research has nothing to offer in this domain other than to suggest that the performance of system directors is critical to the success of any information system. In situations like this, some of the applied research methods adopted by information research community, such as action research can be of immense value. For example, action research could obtain practical results of value to groups and at the same time add to the body of theoretical knowledge.

#### **9.4. Developing countries**

The case studies related to the current study are concerned with the public administration in India. However, the study can still offer valuable lessons to other developing countries because, despite their diversities, developing countries share many common economic, socio-political and technological problems. For example, almost all developing countries are now in the process of introducing large computer-based information systems within their public administration. However, they should be aware that the very factors that constrain the performance of their public administration could constrain even the successful application of information system within their public administration. At the same time, they also should be aware that the success and failures of information systems depend largely on the activities of organisational members who associate themselves only implicitly. That is, making efforts to improve the performance of individuals who are associated with the application of information systems in an explicit manner is no guarantee for effective information systems. Today, the education system in most developing countries does not provide appropriate

information systems related knowledge/skills to different organisational members. In this context, providing strategic members with short-term, skill-based IS related training or providing systems analysts with technological knowledge has very little value.

## **9.5. Epilogue**

Every frontier technology usually brings in fresh hopes that it can be utilised by developing countries to accelerate socio-economic development, and information technologies are no exception. However, today, in utilising information technologies and related products within their public administration to promote socio-economic development, developing countries appear to be facing a complex puzzle - a puzzle that is similar to that of the *chicken and egg* puzzle. That is, developing countries are struggling to understand whether information technologies would improve the performance of their public administration or whether their public administration should improve their performance before information technologies can be of any use to them.

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