Malaysia Journal of Computer Science, Vol. 11 No. 1, June 1998, pp. 32-40

IMPLEMENTING INFORMATION SYSTEMS PLAN IN MALAYSIAN GOVERNMENT ORGANISATION: A MULTIPLE PERSPECTIVE FRAMEWORK

Mokhtar Mohd. Yusof
Ministry of Finance, Malaysia
email: mokhtar@treasury.gov.my

Ruzaina Wan Haniff
Attorney-General's Chambers, Malaysia

Chong Oie Chua
Chemistry Department, Malaysia
email: cochua@jkpj.kimia.gov.my

ABSTRACT

Summarises the limitations of the rationalistic approach for the design, implementation and appraisal of Information Systems Planning (ISP) and advances an interpretative cultural approach addressing the symbolic, boundary redefining and cultural attributes of ISP. Recognising both perspectives provides richer insights about the meaning and role of ISP in organisations. This suggests that managers, developers and researchers' efforts must embrace not only the instrumental technology of ISP, but the wider organisational and symbolic issues involved in the implementation of such systems.

1.0 INTRODUCTION

An information systems plan (ISP) is the blueprint that forms the basis for the initiation and development of information systems in any organisation. Without a clearly defined ISP, computers would merely become an expense which does nothing to add value to an organisation. A critical dimension that must be considered in developing an ISP is the human, psychological and cultural aspect. For instance, will there be an actual concerted effort to review, revamp and redesign the business processes? Will there be a move to redefine job requirements and skills? Will there be incentives to facilitate the process of change? What are the required values and beliefs to facilitate the acceptance of the ISP by the users? These, and many other questions of this nature, are of crucial importance and must be addressed at the very outset by everybody within the organisation. The technical people with their detailed knowledge of information technology should coax, lead and guide users toward building and developing workable business solutions for the organisation. A totally new paradigm must be established to take advantage of information technology.

1.1 Theoretical Frameworks

As stated by Myers [1], the main reason for the lack of a theoretical foundation in the IS implementation research area is that most of the models have been borrowed from the natural sciences, and from engineering in particular. This simply reflects the dominant paradigm in IS research, which is called "essentially positivist" by Orlikowski and Baroudi [2]. According to them (p. 5) positivist studies "are premised on the existence of a prior fixed relationship within phenomena which are typically investigated with structured implementation. Such studies serve primarily to test theory, in an attempt to increase predictive understanding of phenomena".

Myers [1] argues that if the positivist research paradigm continues to be used, real progress in understanding the implementation of IS will never be made. The assumptions made by positivist are invalid when they are applied uncritically to social reality. For example, there is constant change among the relationships between people, organisations and technology. People think and act, and they are active creators of their physical and social reality, which is what the natural science model seems to ignore [2] (p. 13). Also, the positivist prediction for a predictive understanding of phenomena (in a deterministic way) ignores the facts that people continue to learn and humans can change their minds.

If the implementation of information systems is primarily concerned with people, organisations and organisational change, a theoretical approach that is appropriate to its subject matter is required. From a positivist engineering or computer science perspective, the key question is how technology works. But as Winograd and Flores [3] point out, this perspective neither supports an adequate understanding of what a computer does in a context of human practice, nor does it support an adequate understanding of what IS mean to people. The key questions for the implementation of IT are how computers are used, and what computerised IS means to people in an organisational context.

This study argues that an implementation using a richer and integrative view of IS is required. One such approach is proposed in this study: the multiple perspectives of the ISP process.

1.2 The Multiple Perspectives Approach

The concept of multiple perspectives, a remedy intended to overcome domination by the technical perspective (T), includes two other perspectives: the personal perspectives (P) of the individuals involved and the organisational perspectives (O) of the social system in question [4]. This approach of using three types of perspectives enable us to take into account individual and social values, and to introduce design participation of the actors and agents affected.

Further, the work of Mitroff and Linstone [5] helps us to recognise that we now live in the world that is very "messy". They provide enough reasoning to suggest that, in today's world, economic success demands that one should be able to examine problems from "multiple perspectives". This is encompassed in what is called Unbounded Systems Thinking. It is fundamentally a transdisciplinary inquiry system - based primarily on the multiple perspective concept and attempts to combine the "agreement", "analysis", and "conflict" into the technical perspective.

Linstone and Mitroff [6] argue that what is important above all is that there should be a deep interweaving of technical, organisational, and personal perspectives if messy problems are to be unravelled. Moreover, this must be accomplished at a higher ethical level: "Ethical management implies the ethical integration of T, O, and P. It means simultaneous, balanced action: individually, in a moral way; technically, in a rational way; and organisationally, in a just way" (p. 342). Walsham [7] has linked the implementation of IS with the dynamics of organisational change. His broadly based work reviews the political and cultural metaphors for organisations and includes both case descriptions of organisational change processes and more prescriptive material on practical methods of intervention for an IS implementor.

However, by recognising different forms of knowledge, the multiple perspectives approach is associated with practical difficulties. As a result of their backgrounds and traditions, people tend to select one particular perspective over other perspectives. For example, systems analysts are often happier when taking a technical perspective of a situation. Attempting to perceive the situation more broadly by selecting the organisational view while at the same time marginalising technical issues is not necessarily a better solution. The perspectives represent different knowledge interests and thus need to be considered jointly. There are no simple rules for balancing the requirements of different perspectives because they cannot be reduced in any meaningful sense to a single perspective. Indeed, the perspectives should be expected to produce conflicting requirements and this dissension used as a basis for discussion and action. Thus, in using multiple perspectives we need to be able to apply methods that reflect the different knowledge interests, to be aware of the limitations of different methods, and to use judgement to reach a balance.

2.0 AIM OF THE STUDY

The Malaysian Civil Service operates within the Malaysian cultural context, which is characterised by the notion of hierarchical structure. There is a tendency towards formal structures, figureheads, and inhibition in implementing proactive strategies that support organisational development.

The study is important from the perspective of designing effective information systems plan for government organisations for the following reasons:

- There is a need for more qualitative studies that contribute to our search for increased understanding of IS phenomena. Studying the interdependence of technical and social change using a qualitative method of inquiry will enhance the subjective understanding of these phenomena.
- Senior executives in government organisations are important stakeholders. They can affect as well as be affected by an individual's, group's, or institution's policy or policies [5]. Therefore, the environmental and behavioural factors need to be considered in designing IS (i.e. the behaviour of senior executives is not well understood by systems analysts).
- IS practitioners (or systems analysts) in government organisations have little methodical guidance as to how to deal with organisational changes and issues related to organisational roles. Their efforts continue to focus mainly into systemizing the most technical tasks of IS implementation.
- To what extent has the research been done on developing IS plan in government organisations, especially in a Malaysian context[1] and, what are the level of efficiencies in developing IS in such organisations? [8, 9].

This paper seeks to understand the business process of a Division[2] of the Government Ministry, and where appropriate, to develop and formulate a new business process that will facilitate the Division to better manage

[1] In the present researcher's knowledge, so far only the study by Han [9] relates to the IT policy formulation and implementation and its effects on departmental computing in Malaysian government organisations.

[2] In this study, Division refers to a functional unit in one of the Ministry in government organisation and Section is a functional unit of a Division. Due to the confidentiality of the information the name of this Division cannot be revealed.

and utilise its fiscal resources. It also seeks to unify the various popular prevailing methodologies and techniques available today.

The focus is on a description of the ISP process, giving attention to the problems of interpreting the context in which the implementation takes place (an O perspective). Soft systems approach [10, 11] is one approach used to model the context of the ISP process. Aspect of the P perspective in this study is being addressed by using the Business System Diamond, adapted from Hammer & Champy [12].

3.0 RESEARCH FRAMEWORK

3.1 Approach

The study uses a multiple perspective approach [13][3]. Fig. 1 shows the process involve in the study, which is divided into four parts as follows:

- Part 1 represents the overall approach to the study which is reflected by the researchers' background, experience, knowledge and training
- Part 2 is the actual study process undertaken by viewing the issues and problems within the organisation using various methodologies and techniques available today
- Part 3 goes into analysing and interpreting the results of the study
- Part 4 is the formulation of the ISP.

3.2 Method

This section outlines the steps taken throughout the study to enable the researchers to integrate a business process re-engineering (BPR)[4] [14] effort as part of the process to formulate the ISP for the Division. It discusses the multiple perspective framework. The detail study was conducted in accordance with the flowchart shown in Fig. 2.

- **Planning**
  The key input during the planning stage was the "Terms of Reference" document which encapsulates the researchers' direction and objectives of the project.

- **Data Collection**
  Three techniques were employed for data collection: interviews; informal conversation; and consultation of reference materials. It is to be noted here that it was not the objective of the data collection process to draw out detailed information concerning the business process. Rather, the researchers intended to understand the underlying principles of the business processes within the division and not to study the actual process per se.

- **Analysis and Interpretation**
  At this stage, the data collected during the process were consolidated, analysed, interpreted and summarised to enable the researchers to identify the next step to be taken. Essentially, it is to understand the underlying factors for the various processes so that a decision could later be made as to whether a certain process needs to be re-engineered.
  The techniques employed during this stage include:
  - Critical Success Factors Method[5]
  - Process Mapping Workshop with two key techniques employed during this workshop i.e. the Business System Diamond[6] and the Nature of Work technique[7].

- **ISP Formulation**
  At this stage of the study, the researchers put forward several recommendations which could be built into the Division's Information Systems Plan. The Information Systems Plan should, at the very least, contain the information architecture, the solution architecture, the implementation strategy and the justification of the plan.

[3] The "multiple perspective" framework, adopted in his study, provides a total systems rationale, allowing for both the formal-rational technical approach and the social parameters. Research data were collected based on an exploratory pilot study conducted through questionnaires and two in-depth case studies of Malaysian government organisations. The study concludes that IS implementation can neither be understood nor undertaken independently of the multiple perspectives of its stakeholders and multilevel processes that affect its implementation, use, and development.

[4] Peppard [14] argues that although BPR is a 'theme' that has been around since 1980s but it is a recent addition to the management vocabulary and the concept has been applied to a wider audience.

[5] The critical success factor method was designed by Rockard and de Long [15] which is used to identify factors, areas or issues that are critical to an organisation's success.

[6] As designed and suggested by Michael Hammer and James Champy [12].

[7] This study was conducted by IBM in 1987 as part of its Strategic Workgroup Solutions methodology in developing business solutions for white collar workers.

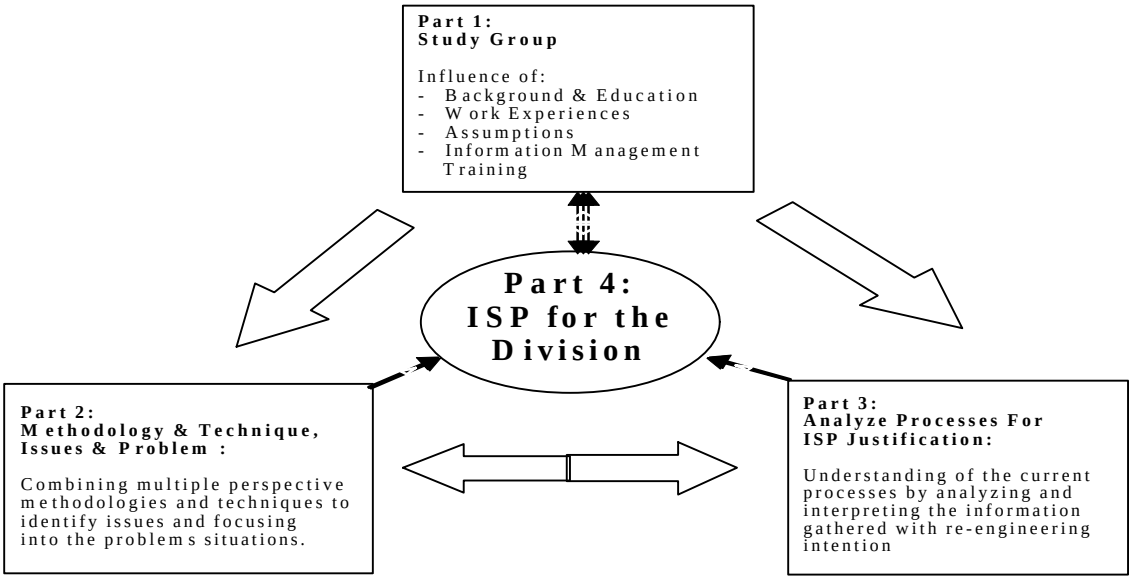

Fig. 1: The multiple perspective approach

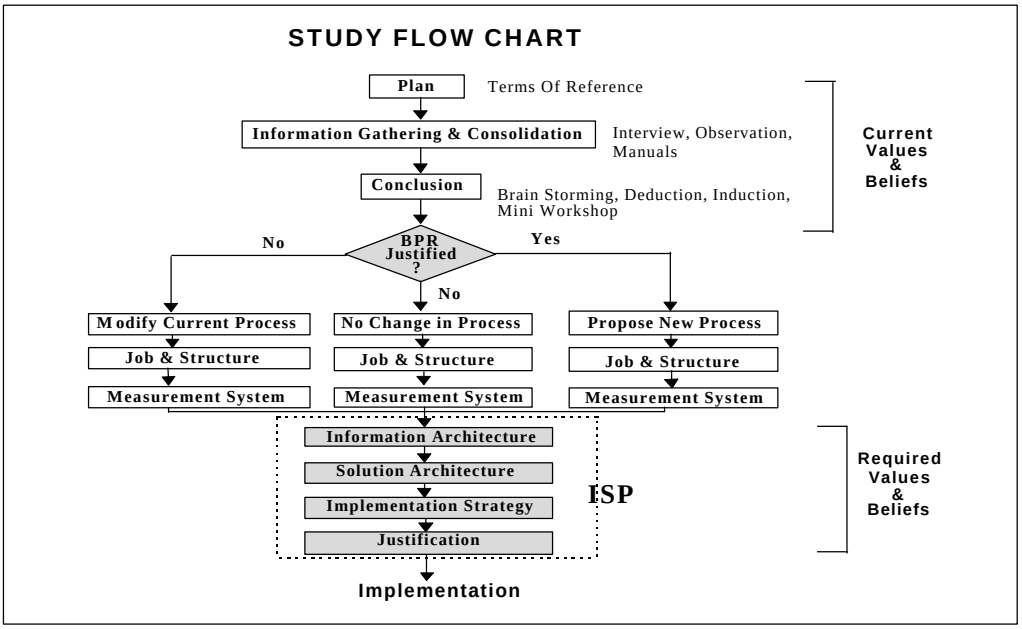

Fig. 2: The Study Flowchart

It should be noted here that we recommend the Information Projects PDIM[8] Life Cycle model as a means to develop the Information Systems Plan. This approach suggests that IT based projects (or any projects for that matter) are a continuous process. The model does not suggest that there is only one point of entry for IT projects. Although, ideally projects should first be planned, then followed sequentially by design, implementation and management stages, this however may not be practical in the real world. The strength of this model is that one may start at any point and then "perfect" the project at second cycle of the project.

[8] PDIM life cycle refers to Planning, Development, Implementation and Management.

3.3 Values and Beliefs

Throughout the study, the researchers were also mindful of what we considered a critical issue in Business Process Re-engineering; that is the values and beliefs system. An attempt was made to analyse the prevalent culture with a view to identifying relevant issues that must be addressed if business process re-engineering is to contribute to the Division's success. In order to identify the required action plans, two "points" in the cultural time continuum were identified such as the current or pre-BPR values and beliefs, and the required future or post-BPR values and beliefs.

Since cultural issues are, more often than not, "soft" issues and very difficult to change in the immediate time frame, one fact remains. There must be a very high, albeit uncompromising, level of commitment from everybody throughout the Division beginning at the top. We believe that this could be effectively done with a planned and structured approach to realign the knowledge, skills and attitude[9] [16] of the whole division.

3.4 Limitations

The findings of any research or study, particularly a study that focuses on people's issues, cannot be entirely free from bias of the researchers. Thus, the study conducted for this paper is also dependent and influenced by various factors such as the team's academic background and work experiences, their pre-conceived notions, influences from external sources and training received.

The following are several constraints and limitations of the study:

- The findings of this study are bounded by the limitations of the methodologies and techniques employed.
- The Division is part of a bigger set-up; that is the Ministry which in turn is part of the Malaysian government at large. Due to the scope of the project and the time constraints, we had only focused on the processes that were within the jurisdiction of the Division alone.
- The focus of this project is to understand the stakeholders' role during ISP process within the Division as well as to expose the researchers to the field of business re-engineering. A full-fledged business re-engineering effort will require a separate study and is outside the scope of this project.

4.0 FINDINGS

4.1 Introduction to the Ministry and its Division

The Ministry's mission is to formulate, plan and implement fiscal and budgetary policies to promote sustainable economic growth, improve national economic resilience and to ensure a more equitable sharing of national wealth. The main objectives of the Division are:

- to determine, implement and administer policies on monetary issues, external loans and national debt, savings and financial institutions, funds, privatisations and government investments; and
- to grant and manage loans to federal and state governments, government companies and statutory bodies.

The Division houses 44 officers and 40 supporting staff. Table 1 shows the Sections within the Division and their areas of responsibility.

Table 1: Functions and responsibility of the Division

Section	Areas of Responsibility
External Loan and Money Market	• Procurement of loans from foreign and domestic sources to finance development project • Formulation and regulation of financial policies of the security industries, the banking sector, the financial institutions and provident funds.
Internal Loan	• Monitoring and granting of loans to the state government and its agencies, to regional development agencies and to privatisation projects.
Privatisation and Investment	• Formulation of policies relating to privatised projects. • Monitoring of investments made by companies under the Ministry.

4.2 Current Organisational Set-up

The current organisational set-up of the Division reflects a traditional approach whereby Units which perform similar tasks were placed and grouped under a Section. And the set-up was not updated even when there were changes in the functions of the Unit. Besides that, there are several other issues, challenges and salient features of the current environment.

4.3 CSFs to be addressed

The critical success factors (CSFs) of this Division have been identified in Table 2 as follows:

[9] Dr. Stephen R. Covey [16] in *The 7 Habits of Highly Effective People* identified that the three components that could contribute to behavioural changes are knowledge, skills and attitude.

Table 2: The critical success factors identified

WORK PROCESS	Work process must be clearly identified and defined so that human resources are positioned to effectively support and achieve the business objectives.
SKILLS	There must be an on-going process to identify, define, develop, nurture and review the skills consistent with the needs of the business process.
MEASURES OF SUCCESS	A system of measurement must be introduced to gauge the success of the Division in terms of the turnaround time, revenue, cost of operation and individual performance plan.
INFORMATION	Information must be available, accessible and usable on demand to support the work process.
TECHNOLOGY	The effective use of information technology must continuously be promoted to automate routine procedures and augment the thinking process.
VALUES AND BELIEFS	There must be an uncompromising level of commitment from everybody within the Division to see that the Division succeeds and to realise that each individual can make a difference.

4.4 Overview of the Processes

As mentioned earlier, based on the current organisational set-up, we had arrived at a simplified overview of the business processes of the organisation. We have identified and divided the business processes of the Division into five key functional areas which we feel is the r'aison d'etre of the Division. These are:

- To procure and monitor borrowings from external and internal identified sources and ensure due payment of such loans by the Government (sourcing process).
- To grant loans to internal agencies for development of national projects and ensure due repayment of such loans by the agencies concerned (loan application process).
- To perform financial evaluation of all privatised projects (evaluation process).
- To audit fiscal policies of the Government and ensure its adherence to standards by key organisations and industries (auditing process).
- To monitor and ensure that the usage and application of financial resources are in accordance with the financial policies (monitoring process).

4.5 Proposed Process

This section highlights the proposed business processes which could effectively contribute to the success of the Division's vision, mission and objectives. During the business process re-engineering justification process (Fig. 2), we found that only one process needs to be re-engineered, one to be modified, and three should remain as they are, as depicted in Table 3.

Table 3: Summary of findings and recommendations of Key Business Processes

Process	**Findings and Recommendations**
Sourcing	Modified
Loan Application	Re-Engineered
Evaluation, Auditing and Monitoring	Remain As They Are
Note: The "Evaluation, Auditing and Monitoring" processes are mainly creative in nature and cannot be re-engineered until a more in-depth analysis (which is outside the scope of this study) is done.	

Based on the traditional concepts, the organisational set-up and structure would pre-determine the business processes of every organisation. However, we believe that this approach would create business processes which would not necessarily meet the organisation's objectives. Worse, it could even work against the business objectives.

The business re-engineering approach requires a redesign of job structure and business organisation that would support the planned business process. This means that the following must be done:

- The business process should be clearly defined.
- The skills required throughout the business process should also be clearly defined.
- The human resources should then be developed according to the skills required throughout the business process.
- Finally, the organisational set-up should empower designated individuals to execute their respective tasks effectively.

4.6 Critical Values and Beliefs

The following table summarises the findings of the study through soft analysis[10]:

Table 4: Soft analysis of findings

INFORMATION	VALUES & BELIEFS	MEASUREMENT OF SUCCESS
• No sharing of information • Lack of necessary information for making investment decision • Unclear of what information is required to make decision • No bench mark for comparison of information • Incomplete and back-dated information • Lack of free flow of information downwards • Inability to access information on demand • Inability to verify information received from external sources	• Idealistic thinking of the current working ways • Perception of low commitment from top management • Do not view people who use their service as customers • Reluctance to sug-gestions and alternatives	• No customer-oriented measurement of success • Lack of cost consciousness • Unable to strategically forecast future needs in terms of measure-ment and management areas • No integrated plan towards implementation /application of technology at workplace • Value adding to outside scope at the expense of core responsibility • No emphasis on scenario planning

5.0 DISCUSSION

The aim of the present research is to increase an awareness of the critical process in IS and improve its practical implementation in government organisations through improved understanding. The findings are, therefore, intended to initiate change in social relationships and work practices in the government administration. The present study is, therefore, guided by the epistemological belief that the primary endeavour is to interpret and analyse the social world from the stakeholder's perspective. It is assumed that the criteria by which knowledge in the field can be identified may be constructed by describing how practices and meanings are formed, and by analysing the language and tacit norms shared by actors in the situation being investigated.

The current business processes within the Division are more complex, less structured with a lot of overlapping functions and very vague. The need to simplify the current business process is central in business re-engineering thinking because the objective of the initial process study is not to do an in-depth analysis of the process but merely to gain an understanding of the underlying reasons why a certain business process is in place.

Our findings indicate that one of the key challenges in identifying the business processes within the Division is the lack of a clearly defined and structured process. Business processes are developed along the way because there is no total strategy in planning, designing, implementing and managing the business process.

Like most traditional organisational set-ups, the business processes are designed only after the organisational structure has been determined. This made it difficult to actually comprehend what each Section is doing.

Investigations reveal the following characteristics[11]:

- Business processes are neither integrated nor interdependent.
- The processes do not encourage people to synergize.
- There is a high volume of paper usage.
- The data submitted from external sources are currently stored manually.
- The retrieval of the data and information from the files is time consuming.
- There is inability to extract historical information to support analysis due to high volumes of data currently maintained.
- There are insufficient workstations to support the current workload.

On this basis, and through the application of multiple perspectives analysis to the case studies (Table 5), the apparently successful outcome of ISP processes is directly related to the ability of knowledgeable actors to mobilise contextual elements towards an integrated system of technological subcultures that share meanings, visions, values, and resources.

[10] Adapted from Soft System Methodology developed by Checkland [10], Checkland & Scholes [11]

[11] Although this study covers only one of the Divisions in a government ministry, similar outcomes were also observed in the studies by Han [9] and Mohd-Yusof [13]. If Multiple Perspective approach was used to study the successful implementation of IS project in other government agencies like Public Service Department, Education Ministry or Electronic Government project, we believe the same pattern will emerge, thus common mistakes in implementing IT projects can be avoided.

Table 5: Summary of findings from multiple perspective

TECHNOLOGY	ORGANISATIONAL/ WORK PROCESS	PERSONAL/ SKILLS
• Lack of basic tools to help in professional work • No plan to update or expose personnel to IT capabilities • No emphasis on scenario planning • Administrative infrastructure evolve over time -not sensitive to current needs • No functional integration between business & IT • Very low machine to people ratio (10:1) • Implementation and acquisition of technology through others • Lost of confident .and trust in the technical people • Long turnaround time for support from the technical people • Backlog on requirement not fulfilled by the technical people • Distrust over security of technology • No initiative to justify or do not know how to justify for computerisation • Fear of failure in computerisation	• Policies and guidelines are poorly or not documented • Duplication of work - redundancy • Most of routine work - manual • Recurring work - not properly routine • Document of business process not updated (e.g. the "Desk File") • Irregular meeting in assisting in problem solving • Dissemination of policy is not clear or timely • Lack of standard in technology implementation • Very protective over own jurisdiction	• Change or the unavailability of officers will affect work • Too much inbreeding • No consistent skill development plan (technical related professional) • Over dependent on personalities' skills and knowledge • Lack of required skills and knowledge

Table 6 illustrates some of the current values and beliefs prevalent in the Division today. These values and beliefs must be addressed to enhance and support any business re-engineering efforts within the Division.

To implement the proposal strategy successfully, the Division must undergo a change in management process (physical and attitudinal). This is to ensure that the right values and beliefs are promoted. The implementation plan requires the following changes:

- Management must support the cause and the efforts needed to implement the change
- The user must be committed towards the implementation of the strategy.

Table 6: Current Values and Beliefs

• Idealistic thinking of the current working process • Perception of low commitment from top management • Do not perceive people who use the services as customers • Fear or unsure of computerisation capabilities

6.0 CONCLUSION

The research has illustrated the value of the multiple perspectives approach in the empirical, theoretical, and practical analysis of the government ISP process. The multiple perspectives framework provides for new directions in the study of organisational phenomena, within a unified and cohesive framework. It provides for both researches into organisational theory, and the development of frameworks for practical implementations and interventions in organisational processes. Traditional theories and models have lacked cohesion in that they have tended to focus on ISP implementation strategies as macro-level issues, and have not provided adequate links, or explanations of the links, between implementation strategies and the development and use of ISP in organisational activities.

The methodology used here also highlighted the value of using multiple methods in IS research, combining qualitative and quantitative methods of collecting and analysing data. From a qualitative interpretivist point of view, this study relies heavily on actors' accounts of their experiences and interpretations of events. In so far as individuals replied cautiously in many cases and imparted information selectively, the findings can be misleading. This could be remedied to some extent by relying more on participants' observations and documentary evidence by which intentions and impressions could be weighed and judgements made, and formulated hypotheses which could be further investigated and tested using different indicators from different sources. In this way two variables that are suspected of being related may well be found to relate or, at least, have some association that has validity is and worthy of further investigation.

The results of the field research in this study indicate that ISP is a multilevel phenomenon and needs to be implemented not solely on the grounds of technical feasibility, but within the framework of a strategic corporate philosophy which recognises the social and cultural aspects of the implementations as being critical to their success.

The prescriptive framework discussed in this study could be used to devise specific guidelines or to contribute to new approaches in ISP implementation process and practices. Such prescriptive guidelines could be used to

elaborate on the human aspects of formal design methodologies. Training programmes could be developed and tailored to be meaningful to individuals or cultures who have different world views, educational backgrounds, and levels of responsibility.

REFERENCES

[1] M. D. Myers (1994), "Dialectical Hermeneutics: A Theoretical Framework for the Implementation of Information Systems" *Information Systems Journal*, Vol. 5, pp. 51-70.

[2] W. J. Orlikowski and J. J. Baroudi (1991), "Studying Information Technology in Organisations: Research Approaches and Assumptions" *Information Systems Research*, Vol. 2, pp. 1-28.

[3] T. Winograd and F. Flores (1987), *"Understanding Computers and Cognition, A New Foundation for Design"* Addison-Wesley, New York.

[4] H. A. Linstone (1981), *"Multiple Perspective for Decision Making: Bridging the Gap Between Analysis and Action"* New York: North-Holland.

[5] I. I. Mitroff and H. A. Linstone (1993), *"The Unbounded Mind: Breaking the Chains of Traditional Business Thinking"* New York: Oxford University Press.

[6] H. A. Linstone and I. I. Mitroff (1994), *'The Challenge of the 21st century: Managing Technology and Ourselves in a Shrinking World'* State University of New York Press, Albany, NY.

[7] G. Walsham (1993), *"Interpreting Information Systems in Organizations"* John Wiley and Sons, Chichester.

[8] R. M. Mohamed (1990), *"Designing a Methodology for an Office Communication and Information System for Executives in the Malaysian Public Sector: The Case of the Prime Minister's Office"* Unpublished Thesis, University of Aston, Birmingham, UK.

[9] C. K. Han (1991), "*Information Technology Policies and Government Information Systems: A Multiple Level Perspective"* Unpublished Thesis, University of Cambridge, UK.

[10] P. B. Checkland (1981), *"System Thinking Systems Practice"* John Wiley, Chichester.

[11] P. B. Checkland and J. Scholes (1990), "*Soft Systems Methodology in Action"* John Wiley, Chichester.

[12] M. Hammer And J. Champy (1993), *"Reengineering The Corporation - A Manifesto For Business Revolution"* Nicholas Brealey Publishing.

[13] M. Mohd-Yusof (1996), *"The Senior Executives's Role In The Computer-based Information Systems (CBIS) Impementation Process: The Case Of The Malaysian Government Agencies"* Unpublished Ph.D. Thesis, University of Salford, Salford, U.K.

[14] J. Peppard (1996), "Broadening Visions of Business Process Re-engineering" *Omega, International Journal of Management Science*, Vol. 24, No. 3, pp. 255-270.

[15] Rockard and de Long (1988). *"Executive Information Systems"* McMillan.

[16] Stephen R. Covey (1989). *"The Seven Habits of Highly Effective People"* Simon & Schuster New York.

BIOGRAPHY

Mokhtar Mohd-Yusof received his Ph.D. degree in information systems from the University of Salford, UK in 1996, an M. Sc. in computer science from National University of Malaysia, a B. Ec. in applied economic from University of Malaya, K.L. He is currently an IT Manager of Treasury, Malaysia and also an Adjunct Lecturer at University Putra Malaysia. He has served various government agencies including as IT Project Director for National Registration Department, as Systems Analyst in Examination Syndicate and as Project Officer in Johore State Economic Development Corporation.

Ruzaina Wan Hanif is a Deputy Public Prosecutor in the Attorney-General's Chambers. She has served various key organisations including the Ministry of Finance, Ministry of Foreign Affairs, Kuala Lumpur High Court and Ministry of Defense. She obtained her legal qualification from the University of Malaya.

Chong Oie Chua is currently a Chemist at Chemistry Department Malaysia. Previously he had served at The Public Health Institute, Ministry of Health. He is a member of AMIC. Chua has a B.Sc. (Hons) Chemistry from University of Malaya.