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A Systemic Approach to IT Policy: A new perspective for developing countries

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Abstract

This paper will explore the argument that some developing countries, Venezuela in particular, could benefit from a systemic information technology (IT) policy that enhances and improves the processes of a country's socio-economic development. Furthermore, some of the IT issues surrounding Venezuela's operation in the global arena will be discussed recognising that a more dynamic approach, which encompasses social, political, technical and cultural factors, must be considered when designing national policies. A number of preliminary suggestions to incorporate a systemic approach to assist Venezuela's socio-economic development are put forward.

Keywords

Developing countries, information systems, IT policy, systems thinking.

1. Introduction

It is argued in the literature (Lal 2001) that the institutional environment created by governments in the form of policies and strategies has a bearing on socio-economic development. However, as Herbert (2000) points out, globalisation often demands deregulation by national governments resulting in fluctuations in existing policies and impacting directly on the development of a Nation. Dohlman and Halvorson-Quevedo (1997) observe that this is a common issue for developing countries aiming to build up their information technology sector. Unfortunately, countries that are unable to enact adequate IT policies are also unable to take advantage of the new technologies. This may well be the case in Venezuela.

Looking specifically at Venezuela, emerging and advanced forms of digital infrastructure, such as the Internet and online information services, have been slow to be developed. One of the reasons for this is the lack of effective strategies to address the country's global integration. Venezuela is a

relatively small country located in the northern part of South America and is the sixth largest oil-supplier in the world enjoying huge oil revenues. Even so, 52 per cent of the population is below the official poverty line (World Bank 2000). Oil has been the country's only key to entering the global arena (Coronil 1997). Paradoxically, the IT sector is often ignored as it is seen as an area requiring a high level of investment.

Information technology is considered to be the backbone of the socio-economic development for developing countries and the level of investment in such an area should not be questioned when poverty alleviation, health improvement and other benefits are present (see for example, the proceedings of the IFIP WG 9.4 conferences: 1993-1996). Simultaneously, policies are hailed as the basis of IT development by providing a solid foundation for multinationals and nationals to be able to enact in an e-commerce environment. It is important therefore for developing countries, like Venezuela, to apply more effort to finding out where they have gone wrong in developing effective policies. Where do the problems really lie and what can be done about them? Developing countries need to learn – within their own environment – ways in which IT policy can be created and applied to serve their own country's needs. As Joham (2002 p. 126) stresses, "effective policies are of increasing importance if countries want to benefit from the global stock of knowledge".

In developing countries where access to new technology is denied for political or economical reasons, lack of knowledge prevails, poverty is encouraged and therefore progress is condemned. Can socio-economic development be achieved in environments like this? Systems encouraging a country's information technology innovations and strategies for adopting new technology are required as the main steps for development. The evidence to support this comes from this in progress research of Venezuela's current IT strategies and from other developing countries like Colombia (Gomez 1998 & 2000).

Building on our professional experiences and examples from above, this research will explore the argument that developing countries, like Venezuela, would benefit from a systemic IT policy which includes factors such as social, political, technical and cultural. The first part of this paper attempts to explain the importance of information technology policies in the information age. A brief discussion of a systemic approach to IT policy will follow. Lack of space prohibits a detailed examination of some of the preliminary research findings, however, a number of issues dealing with the process of policymaking will be explored. We conclude with an open discussion for future research, including a reiteration of Checkland's (1981) Systems Thinking model and highlight some of the key policy implications of IT acquisition which Venezuela will need to address in order to participate in the global arena.

2. The Information Age

The term globalisation needs little introduction here, however, it is appropriate to establish that, from the researchers' perspectives, globalisation is viewed as the many ways "in which space and time have been compressed by technology, information flow, trade and power so that distant actions have local effects" (Joham 2002 p. 126). It is important therefore to highlight that effective IT policies will assure a country's participation in world trade but countries must persevere with their efforts to improve these local effects (that is, IT innovation, R&D, global knowledge, etc). The importance of information technologies is a constant topic in the globalisation literature (see for example, Walsham 2001 and Wiseman 1999). These technologies facilitate globalisation trends. At

the same time, as Landes (1998), Borja and Castells (1997), and Cronin (1996) assert, globalisation has far-reaching consequences for regional technological development policies, which must be based on policies encouraging international trade and investments.

The global environment influences the policies of national governments and defines the opportunities and challenges facing policy makers and business leaders (Joham 2002). For most developing countries multinational and national investors are the only hope for technological development as they are left to participate at the far end of the production line. Developing countries, if lucky enough, can be part of the IT consumer-line mass. It is only with the help of investors that they can aim to position themselves in the supply chain and take advantage of concurrent IT innovations.

3. A Systemic Approach

In accordance with Mitroff and Linstone's (1993) multiple perspectives approach, we see the pattern of IT policymaking being influenced by a complex and dynamic interaction of factors – social, political, technological and cultural – not just a single force or a static process such as the simple conversion of straight international models. As such, the need for a framework to incorporate the analysis and in-depth study of these factors arises. In this study, a systemic approach (Checkland 1981, Ackoff 1971 & 2000) is proposed which includes the interactions between the different factors of a country's policy network and stakeholder groups. In order to obtain a variety of perspectives and identify the issues surrounding a country's operation in the global arena, it was our intention to explore key stakeholders' concerns, not problems (see Metcalfe & Hobson 2001), in Venezuela. Key stakeholders include government policymakers, private and public IT industries and market sectors, education and health sectors, etc. IT statistics, strategies and regulations were measured in relation to the country's IT labour market, computer specialists, research and development, infrastructure, education, economy, etc. Applying Checkland's (1981) terms, the research was primarily concerned with the application of a systemic view (F) - from an holistic perspective – through a multi perspective approach (M), in the area of globalisation, to IT policies guiding a Nation's development (A) as shown in figure 1.
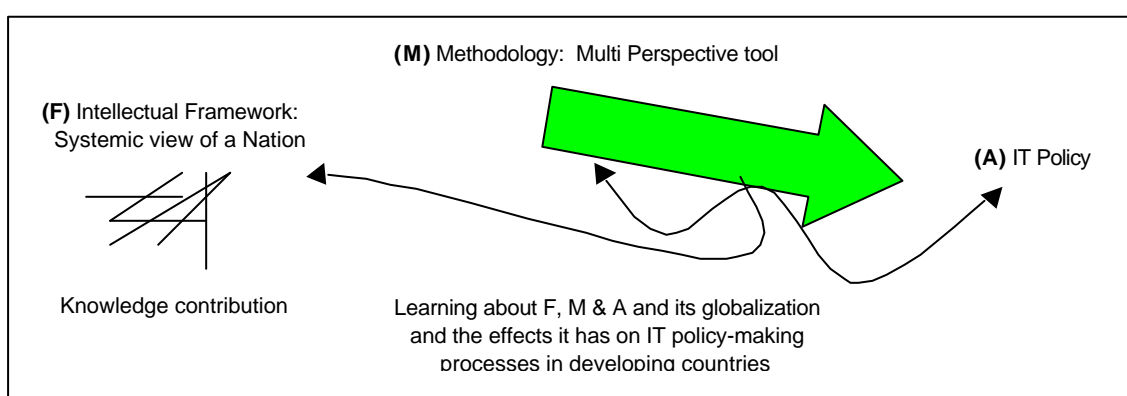

Figure 1. Elements relevant to this research (after FMA by Checkland 1981 & 1991).

From pilot research conducted over two years in Venezuela, social, political, technical and cultural issues were studied in order to integrate the functions of these into a purposeful "system" for use when designing effective IT strategies to enhance participation in the global arena. Data was

collected from the country's IT strategies and regulations but mainly came from extensive questionnaires (89 in total) filled in by local IT private and public organisations, the government and IT educational institutes. From randomly selected questionnaire participants, 35 interviews were completed. Key issues emerging from these interviews were then compared and contrasted with video conferencing material and newspaper's IT articles which were collected chronologically over a period of two years. Figure 2 highlights the major key issues emerging from the data and the frequency (as a percentage) in which they appeared.
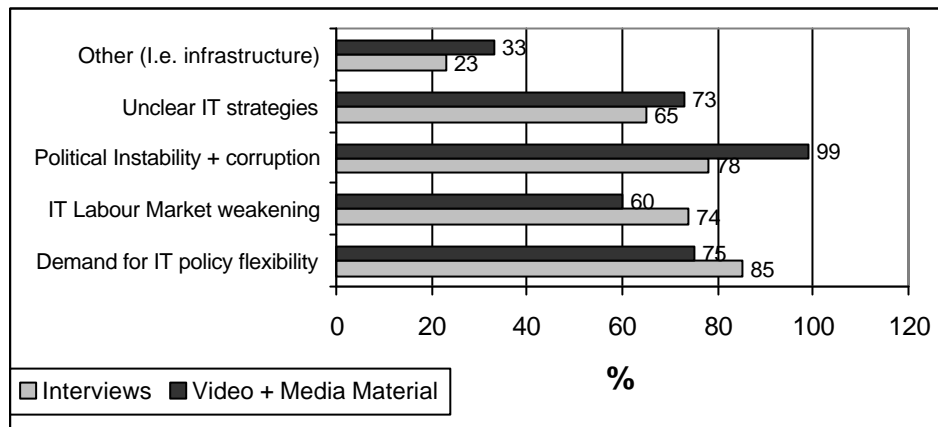

Figure 2. Key issues from interviews and media material (research in progress).

A common finding from the data revealed that recent changes in the country's IT regulations have had an impact on local and foreign investment. For instance, some policies were considered to be rather prescriptive and a more "flexible" approach was demanded from the key stakeholders. The level of flexibility was characterised by their request for an "outcome oriented" policy; an IT policy concerned with achievements, not one done in solo. The recognition of the impact and importance of effective policies was underlined with some of the issues discussed below which, it is suggested, need to be considered by developing countries wishing to enter the global arena.

3.1 Social and Technical Issues

In countries such as Colombia and Ecuador, most policies do not address the social impact of IT on the labour market (Gomez 1998 & 2000). Similarly in Venezuela there is an extensive debate about whether the job market will be attractive enough to retain local IT skilled people; in the last year more than fifty thousand qualified professionals have left Venezuela. Higher income, better living standards and free political social environments in Western countries might have proven too attractive. If these are the people needed to facilitate the smooth flow of global information, how can developing countries afford to overlook these social trends? It is essential that IT policies encourage people to remain in the country and promote the sharing of information and resources, and the smooth integration of information systems.

Most IT policies in developing countries seem to be mismatched with the country's innovative nature of technology and the global market culture. Effective policies must promote the growth of local IT companies through demand and supply-side intervention (action includes funding of training courses, tax concessions, purchase of locally produced IT goods and services, provision of venture capital

and similar finance, assistance with market research and marketing of products in national and international markets, and import protection where possible). Information technology capability, in terms of human resource development, infrastructure development, and institutional development, should be strengthened through both foreign and local routes. Globalisation also means "full participation" (Wiseman 1999). Therefore, if the goods and services of developing countries are not globally competitive, their national and international markets will vanish under attack from more successful suppliers in other parts of the world.

3.2 Political and Cultural Issues

The political perspective is often one that is ignored. As Checkland (1981 & 1991) states the environment in which a problem takes place is often unseen and, consequently, taken for granted. Here we are not only taking into consideration the analysis of social and culture factors but also the role of government and policymakers in the interaction with the country's key stakeholders and global arena demands. Issues to be considered here included: political corruption, government instability, and a lack of overall IT strategy and direction. For instance, some Venezuelans demand that the role of government should be more of a facilitator rather than a ruler and for policymakers to assure that all key stakeholders actively and genuinely participate in all aspects of technology acquisition and policy design processes. On a more general note, the national government must aim for policy consistency to avoid confusion in the IT sector.

Rich and Oh (1993) assert that there has been an extensive attempt to understand the role of government and policymaking in the development of IT systems. Several models for IT utilisation have been tested empirically, at both national and state levels. Most of these studies have been aimed at interrelating, theoretically and empirically, the different perspectives obtained in the data collection processes (for a detailed review see Rich and Oh 1993). The researchers use of multiple perspectives was not directly intended to integrate all the perspectives studied, but to explore them within the fieldwork reflecting on the fact that *systemically the whole is more than the sum of its parts* and that each way of viewing involves distinct paradigms, not merely different scientific models (Mitroff and Linstone 1993).

4. Implications and Future Research

With good infrastructure and skilled human resources, any country can develop its IT sector and enter the information age provided there are government IT policies that provide appropriately trained labour pools. Policies need to be designed to promote IT production directly, support IT industry research and development, and create suitable education policies Appropriate information technology at the level of the policy maker means that information technology provides the means for, or supports, IT activities which, in national terms, are seen as desirable. By formulating an appropriate information strategy, which is favourable and supportive to socio-economic development, it is possible for a country to make the best use of information technology for its overall global progress. Possible strategies could demand that:

- Monitoring and evaluation mechanisms are developed and implemented effectively.

- Inter and intra organisational linkages are in place to take advantage of new economic opportunities.

- The political environment provides the necessary telecommunications infrastructure to develop, use and diffuse IT.

- Support is given to stakeholders' participation in policymaking processes.

- Assistance to IT professionals is encouraged in order to maintain professional standards and provide for career development (for example, research incentives, HR development projects, etc).

A conceptual model, based on Systems Thinking (Checkland 1981), in the case of this research is shown in figure 3. Within this model the aim is to determine a root definition targeting the appropriate information strategy required by Venezuela and the transformation processes involved for this purpose. As Checkland (1991) points out, a root definition is a short textual and clear definition of the aims and means of the relevant system and strategies to be developed. Consequently, a system must have a way of evaluating its performance and the transformation process. The appropriateness of Venezuela's information strategies can be measure by the criteria of: efficacy – E1 = do the policies and strategies work, are the processes and programs achieved?; efficiency – E2 = are these policies and strategies worthwhile?; and effectiveness – E3 = do these policies and strategies achieve their longer-term goals and objectives?
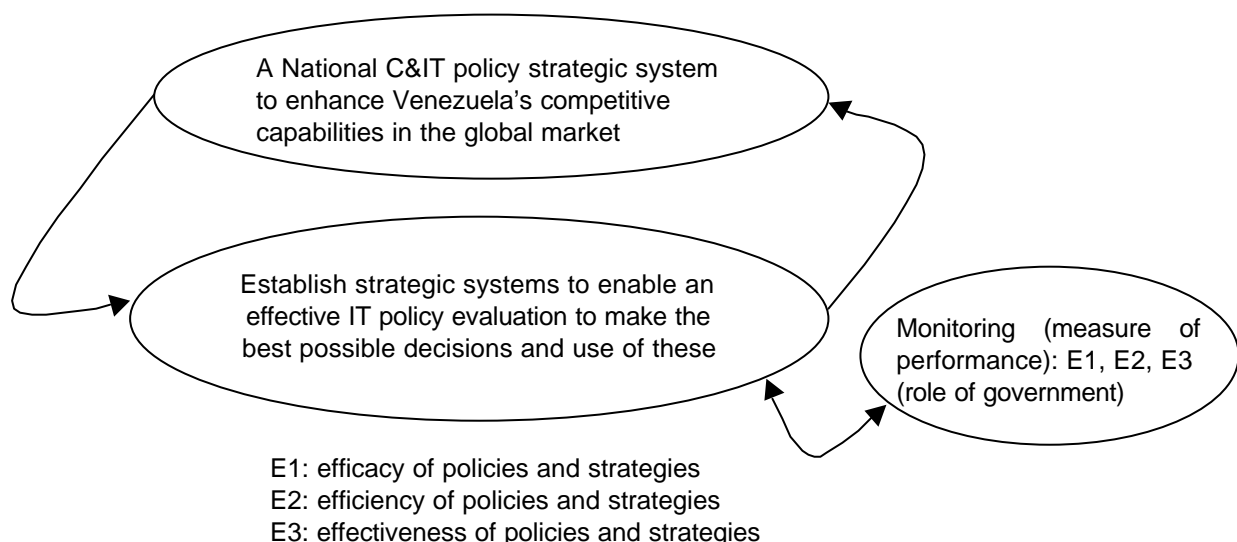
A National C&IT policy strategic system to enhance Venezuela's competitive capabilities in the global market

Establish strategic systems to enable an effective IT policy evaluation to make the best possible decisions and use of these

Monitoring (measure of performance): E1, E2, E3 (role of government)

E1: efficacy of policies and strategies
E2: efficiency of policies and strategies
E3: effectiveness of policies and strategies

Figure 3. IT policy – A conceptual model.

5. Conclusion

There is no single best procedure for managing information technology policies within developing countries as they will depend on external factors such as social, technical, political and cultural issues that will vary from one country to another. Future research is required in order to find ways to manage effective Venezuelan public policy goals in the competitive marketplace of the global economy. However, a multiple perspective framework combined with a systems view could be beneficial in the process of policy making. The researchers will explore further how this may be achieved in the future.

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