

# **IMPROVING EFFECTIVE GOVERNANCE OUTCOMES WITH ELECTRONIC DECISION SUPPORT TOOLS**

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# IMPROVING EFFECTIVE GOVERNANCE OUTCOMES WITH ELECTRONIC DECISION SUPPORT TOOLS

## ABSTRACT

The objective of this paper is to summarise the need for and potential applications of selected user-friendly, state of the art electronic policy decision support tools to promote more successful strategic policy decisions that in turn will improve sustainable service delivery outcomes in the public sector.

Recent international research findings on good governance indicate *inter alia* the following trends : A general acceptance that a strategic management approach focused on committed actions to achieve realistic implementation objectives, is needed to improve service delivery outcomes; this necessitates *inter alia* effective information use and management; a dramatic world-wide increase in the availability of digitised policy related data and high power capacity computer systems to manipulate that data; a resultant dramatic increase in the reliance on electronic management information systems in well developed and relatively successful policy systems to monitor co-ordinate and implement and assess the effectiveness of policy implementation programmes, and an increasing reliance on more user-friendly & less technically complicated & more visual and command driven electronic decision support systems to optimise multi-criteria policy decision-making in order to promote effective policy implementation and service delivery.

In many developing countries, the current state of affairs with regard to the above strategic trends in more developed countries, is not good. The main problems are : frequent incidences of policy failure, attributed primarily to ineffective or bad policy implementation; weak policy implementation capacity and service delivery results; low levels of policy decision-making-related knowledge, experience and skills, especially electronics and management information systems, and low appreciation of utility and potential of such aids; information gaps and uncertainties cause a general policy paralysis which should be transformed into policy activism in order to improve policy implementation and service delivery results.

In order to improve the positive impact of public policy outputs in developing states, the success of public policy-related decisions in government need to be significantly increased. The experiences of different nations where electronic decision support tools have been used or are in use, to achieve a better success rate with public policy design and implementation, are important in this regard. Complex policy decisions with multiple policy objectives that may be contradictory, need to be prioritised in terms of different, potentially also contradictory decision criteria. The adoption and use of more user-friendly but effective electronic decision support systems will not necessarily guarantee policy and service delivery success. It is assumed that these decision aids will, however, maximise the potential for improved or more successful results if they are applied appropriately and effectively.

Elementary electronic decision support tools can be used effectively to improve the success rate of public services delivery, by increasing the nature and scope of accurate information available to inexperienced policy decision-makers about strategic choices regarding policy-related issues, problems, options, strategies, costs, benefits, risks,

probabilities and/or priorities. No integrated package of this nature currently exists. If developed, it could be beneficial to public policy outcomes especially in the developing world, to expose such officials to the utility of DSS tools.

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*“ Decision-making at these high levels of government...is often portrayed as rational decision processes. But in fact, decision making involves managing issues that are forced on decision makers with varying and shifting priorities. Issues circulate continuously; they enter and exit through participants and are resolved in the sense that they dissolve or go away or are overtaken by other issues. The issues are themselves complex, poorly defined, interdependent...Information is voluminous but unreliable and qualitative” (Lauden & Lauden 1998:596)*

## INTRODUCTION

The Presidential Review Commission on the Transformation of the South African Public Service (the PRC) identified in 1998 a series of normative, structural and functional defects in the existing South African Public Service, and recommended a series of significant reforms to attempt to improve the process of governance in general and public services delivery in particular in South Africa. A crucial element of the recommendations was the reshaping of the strategic electronic decision-making and management capacity of central government (see Malabie 1998).

The author participated in the research that led to the PRC report, and expanded that research during a six months' research programme in South East Asia in 1998, where the contributions of the so-called South East Asian “Tigers” (Singapore, Malaysia, Thailand, Indonesia and the Philippines) were assessed, to determine which factors contributed to their varied levels of public services delivery performances over the past decade. A model for improved public services delivery in developing countries was formulated out of the comparative contemporary literature on Good Governance, combined with the experiences of the Tiger countries.

The above research report was subsequently published in book format (Cloete 2000). One of the crucial research findings in this report, was the need to improve the strategic decision-making processes in government, in order to promote good governance by reducing the levels of uncertainty and risk in decision-making which frequently lead to either policy indecision and stagnation or bad decisions based on inaccurate policy issue identification, contradictory policy objectives, incomplete or bad preparation and assessment of policy problems, potential solutions, costs, benefits, risks and priorities.

## ELEMENTS OF GOOD GOVERNANCE

Good governance is prescriptively conceptualised for the purposes of this paper as the achievement by a democratic government of the most appropriate developmental policy objectives to sustainably develop its society, by mobilising, applying and coordinating all available resources in the public, private and voluntary sectors, domestically and internationally, in the most effective, efficient and democratic way.

Public service delivery is similarly conceptualised as the implementation of public policy aimed at providing services to the public.

Developmental policies are public policies which succeed in raising the quality of life of a society's citizens. The objective with sustainable development in this sense is to achieve a self-sustaining improvement in medium to long term life quality. This implies inevitably a coherent systemic integration of development initiatives, resulting in a structural, functional and cultural consolidation of a new way of life; in fact the creation of a development culture in society.

Sustainability is based on the original idea of sustainable use of environmental socio-economic resources immortalised by the Brundtland Commission in 1982. Sustainability will be used in this paper to refer primarily to institutional and functional durability of public policy programmes. Sustainable governance refers to durability of service of a required quantity and at a required level of quality over an extended period. It therefore implies a thorough assessment of all resource implications of service delivery, the incorporation of the results of such assessments into the design of service delivery strategies, and continuous access to the resources needed for sustainable service delivery.

Sustainability in this sense does therefore not only mean the availability of sufficient finances to provide the services needed, but more comprehensively it refers to the overall capacity of the organisation to deliver such services and adapt to changing circumstances over an extended period of time, maintaining or preferably improving the service concerned. Sustainability therefore also includes the notions of flexibility and resilience in the face of set backs. The term is also applicable in a political context. Political sustainability refers to dedicated political commitment : continuous support by political decision makers for the programmes concerned, not only through consistent rhetoric, but also backing their words up by consistent actions (Brinkerhoff 1992, Brown 1998).

In the context of this study , the capacity of the public service is conceptualised in general systems thinking terms as the structural, functional and cultural ability to implement the policy objectives of the government, ie the ability to deliver those public services aimed at raising the quality of life of citizens, which the government has set out to deliver, effectively as planned over time (in a durable way). It obviously refers to the availability of and access to concrete or **tangible resources** (human, financial, material, technological, logistical, etc). Capacity also includes the **intangible requirements** of leadership, motivation, commitment, willingness, guts, endurance, and other intangible attributes needed to transform rhetoric into action. The **political, administrative, economic, technological, cultural and social environments** within which action is taken must also be sympathetic or conducive to successful implementation.

The failure of development policies in lesser developed states can be attributed to many causes. It can in some cases be the consequence of "**bad design**", ie a defect in policy design. Examples of such policy defects include too grandiose schemes with a wrong prioritisation or little practical application (independence sports stadiums, international airports, etc). The policy design error may also be found in a too rigid ideological blueprint, leading to the enforcement of inappropriate policies ( apartheid in South Africa, ujamaa in Tanzania, etc).

Another possible cause for policy failure is “**bad luck**”, referring to reasons for failure outside the control of the policy maker, including natural disasters, a weak international economy, etc (Hogwood & Gunn 1984).

In most cases, however, “**bad implementation**” is one of the major obstacles to effective progress with development in developing countries. This normally refers to a lack of sufficient financial resources to implement policies as envisaged, a lack of sufficient human resources (people, expertise and experience), a lack of sufficient material or technological resources, defective management processes or organisational cultures which obstruct rather than promote successful policy implementation. A combination of these implementation defects normally result in a general lack of policy implementation capacity in the society concerned.

If the resource constraints summarised above also affect policy design, the whole policy system suffers from a serious systemic incapacity to draft policy plans and transform policy rhetoric into visible and durable policy outputs and outcomes. This policy pathology can become a vicious spiral of decline in policy capacity which is in extreme cases (for example in Sub-Saharan Africa), difficult or even impossible to turn around .

## **THE NEED FOR BETTER ELECTRONIC POLICY DESIGN AND IMPLEMENTATION SUPPORT**

In general, those developing countries who appear to have recently succeeded with most of their development programmes, have apparently succeeded with effective and appropriate policy designs. Before the contagious Asian economic flu, countries like Argentina, Chile and the “Pacific Tigers” (including Singapore, Malaysia, Thailand, Indonesia and the Philippines), have also seemingly successfully converted their policy plans into effective and sustainable policy action programmes (Montgomery 1995, Page & Campos 1995, Ravenhill 1995, Stiglitz 1996, Cloete 2000). The recent developments in Asia have, however, highlighted various elements of sustainable capacity-building again. The need for electronic decision support is a crucial variable that is becoming increasingly important.

Recent international research findings on good governance indicate *inter alia* the following trends :

- ◆ A general acceptance that a strategic management approach focused on committed actions to achieve realistic implementation objectives, is needed to improve service delivery outcomes;
- ◆ this necessitates *inter alia* effective information use and management;
- ◆ a dramatic world-wide increase in the availability of digitised policy related data and high power capacity computer systems to manipulate that data;
- ◆ a resultant dramatic increase in the reliance on electronic management information systems in well developed and relatively successful policy systems to monitor co-ordinate and implement and assess the effectiveness of policy implementation programmes, and
- ◆ an increasing reliance on more user-friendly & less technically complicated & more visual and command driven electronic decision support systems to optimise multi-criteria policy decision-making in order to promote effective policy implementation and service delivery.

In many developing countries, the current state of affairs with regard to the above strategic trends in more developed countries, is not good. The trends are :

- ◆ frequent incidences of policy failure, attributed primarily to ineffective or bad policy implementation;
- ◆ Weak policy implementation capacity and service delivery results (Tiger cubs, developing countries in general and SA in particular).
- ◆ Low levels of policy decision-making-related knowledge, experience and skills, especially electronics and management information systems, and low appreciation of utility and potential of such aids.
- ◆ Information gaps and uncertainties cause a general policy paralysis which should be transformed into policy activism in order to improve policy implementation and service delivery results.

In order to improve the positive impact of public policy outputs in developing states, the success of public policy-related decisions and follow-up actions in government need to be significantly increased. Success is for purposes of this paper conceptualised as visible, concrete progress in policy decision-making and implementation towards achieving sustainable good governance along the lines summarised above (see, however, also Alavi & Joachimsthaler 1992, Sanders & Courtney 1985). Against the background of the global electronic revolution, the experiences of different nations where electronic decision support tools have been used or are in use, to achieve a better success rate with public policy design and implementation, are important in this regard.

For the purposes of this paper, it is assumed that policy decision-makers are committed to resolve policy problems, and would therefore like to take decisions that have the best potential to solve, improve or alleviate those problems. It is also assumed that the availability of more as well as more accurate data and information about policy-related costs, benefits, risks, probabilities and priorities, and the user-friendly electronic capacity to analyse, assess and integrate different sets of data for this purpose at various levels, will maximise the potential of successful policy implementation and service delivery in the public sector. The reason for this last assumption is that the self-confidence of policy or operational decision-makers who have little knowledge, skills or experience of some of the complex requirements for good governance, can only be enhanced if they can have access to user-friendly and internationally accepted guidelines and tools to provide them with more accurate and reliable policy relevant information on which they can base their decisions and actions. This will reduce uncertainties and perceptions of risk, and will allow for more confident assessment of policy-related costs and benefits by such decision makers (eg by providing electronic decision support through fully integrated problem structuring decision trees, customised spreadsheet-based weighting, ranking, prioritisation and comparative assessment of the costs, benefits, risks and impacts of different alternative courses of action).

Complex policy decisions with multiple policy objectives that may be contradictory, need to be prioritised in terms of different, potentially also contradictory decision criteria. The increasing use of electronic technologies in governance makes it possible to achieve these objectives. The adoption and use of more user-friendly but effective electronic decision support systems will not necessarily guarantee policy and service delivery success. It is assumed that these decision aids will, however, maximise the potential for improved or more successful results if they are applied appropriately.

I also want to argue that elementary electronic decision support aids that are easy to understand and easy to apply, will increase the transparency and therefore the legitimacy of the policy process, while increased transparency and legitimacy may also reduce resistance against well designed and considered policy change and implementation proposals.

The approach followed in this paper is further a formative one, intended to assist planning processes leading up to a decision. It will not focus on *ex post facto* decision analysis, which has a different objective and methodology that should be followed. It is also a descriptive approach and not a prescriptive one, although it is unambiguously biased in favour of the so-called rational approach to policy decision-making.

## DECISION SUPPORT TOOLS

**A decision support system (DSS) can be conceptualised as an electronic aid intended to improve good governance outcomes by facilitating more systematic and accurate identification, analyses, assessments and linkages of different policy problems, objectives, solutions, costs, benefits, risks, probabilities, priorities and resources.** A management support system (MSS), can be conceptualised as a DSS that supports managerial decisions (Dutta, Wierenga & Dalebout 1997:72). DSS's and MSS's are also distinguished here from so-called management information systems (MIS's) and executive information systems (EIS's) that are normally computer-based information systems that are supposed to facilitate management processes in general or at top executive levels in organisations (eg library facilities and office automation tools like word processing, data bases, spreadsheets, presentation aids, e-mail, internet, etc). These tools are essential for effective governance outcomes, but are for purposes of this paper assumed to be in place and are prerequisites for DSS's and MSS's. Laudon & Laudon (1998:597) capture the distinction as follows : “ *...a DSS is not only an application , but a generalised capability for addressing decision makers' needs. Unlike an MIS, a DSS does not simply involve a routine, steady flow of data, but instead can be flexibly responsive to new situations by using data and analytic models (even spreadsheets) to work through the consequences of decisions and assumptions*”.

The term DSS indicates a comprehensive system consisting of different inter-related sub-systems, parts or tools. For purposes of this paper, the emphasis will not be on the total system but on different, smaller tools to facilitate different aspects of policy decisions. The different types of DSS's include systems that are used for :

- 1 **product / outcome support** (what decisions would be optimal and how is that assessed?). These systems are normally used in the following conditions :
  - Highly structured problem
  - Low environmental uncertainty
  - Low skills levels of end users
  - Rigid decision environment focused on outcomes (Dutta, Wierenga & Dalebout 1997:72) :
- 2 **Process support** (how can one facilitate the process to reach a rational decision, and what variables could be considered ). These systems are normally used in the following conditions :

- structured & unstructured problems
- High environmental uncertainty
- High skills levels of end users
- Flexible decision environment not only focused on outcomes (Dutta, Wierenga & Dalebout 1997:72) :

In order to improve the positive impact of public policy outputs in lesser developed states, the quality of public policy-related decisions in government need to be significantly increased. This can be achieved by supporting and upgrading the decision-making capacities of decision-makers through the provision of user-friendly electronic decision support tools. However, Lauden & Lauden argue that users of DSS tools frequently “ ... *have little or no computer experience, and no patience to learning a complex tool, so the interface must be relatively intuitive... To mimic a typical way of working, a good user interface should allow the manager to move back and forth between activities at will*” (1998:594). This conclusion is important, because it implies that many existing software programmes designed for purposes of decision support, and that are widely used in more developed countries (like Microsoft’s Excel and MSProject packages), are too sophisticated and complex for general application in public management conditions in most developing countries. There is therefore a need for the identification or development of intermediate level DSS’s in order to expose middle level officials to the benefits of such systems and induce them to migrate to more powerful and sophisticated systems like those mentioned above.

## DSS APPLICATIONS

Electronic decision support tools can be used in different ways and in different stages of the policy process. Such toolkits can be especially useful in the following different functional ways :

- **Guiding individual decision-makers** step by step through transparent, standardised processes to reach decisions without their relinquishing control over those processes. This include the drafting of standardised budgets, prioritisation, comparison, cost-benefit, risk and impact analyses (Decideright, SOS, Workbench);
- **Guiding small groups** of decision-makers step by step through transparent, standardised processes to reach collective decisions, again without losing control over those processes. In this case the groups are taken through strategic policy or implementation strategy planning processes that culminate in collective decisions (Impact Explorer, Lauden & Lauden 1998:600), De Vreede, Jones & Mgaya 1998, Dennis, Valacich, Connolly & Wynne 1996, Easton, George, Nunamaker, & Pendergast 1990, Mabin, Menzies, King & Joyce 1997; Salo 1995, Schuurin & Feenstra 1998).
- **Prompting** decision-makers to consider important variables like alternative objectives, solutions – Parkinson 1995, costs, benefits, risks and priorities before making choices, and providing technical assistance on how to do it ( DecisionPro, DEFINITE, VISA, Decideright, SOS, Henderson & Schilling 1985:157, Zeleny 1982:488);

- Providing specialised technical electronic research **tools for modelling** or determining objectives, scenarios, costs, benefits, risks – Clarke & Low 1993, Arrow & Lind 1994, Balcombe & Smith 1999, probabilities, priorities, etc (eg DecisionPro, iDecide, Thinktools, SOS, SIMUL8, V.I.S.A – see Belton 1999, various applications of GIS software, illustrated in Batty & Xie 1994, Da Villa & Panizzolo 1996, Hawkins 1994, Hirschfield, Brown & Bundred 1995, Karnavou & Mikelis 1994, Martin 1991, McIntyre 1994, Taylor 1991, Walker & Young 1997, Yeh & Li 1997).
- Providing decision-makers with pull-down menus or hot links leading to **background information** or templates of standardised formats for useful information like
  - definitions,
  - policy requirements,
  - provisos,
 documentation like contracts, forms, legislation, etc (eg Workbench, DEFINITE);
- **Drafting automatic reports, tables (including budgets), graphs or graphics** containing the above information in a user-friendly written or even visual presentation format that can be integrated into other administrative and secretarial office automation toolkits (eg Decideright).

Electronic decision support tools can also be used at different stages of the policy process, including :

- **Problem identification and structuring** (eg Decision Explorer, STRAD, Thinktools. See also Regan & Holtzman 1995, Rosenhead 1996)
- **Options analysis and assessment** (eg V.I.S.A, Thinktools, DEFINITE, SOS, electronic spreadsheets – Kirkwood 1997, Lofti & Pegels 1996, Ragsdale 1995, Winston & Albright 1997, THRIPP 2000)
- **Option selection / choice** (Thinktools, V.I.S.A, SOS, Goodwin & Wright 1991)
- **Implementation** (eg electronic spreadsheets and various project management software packages)
- **Evaluation & impact assessment** (Workbench, DEFINITE, Impact Explorer, Thinktools).

The ideal would be to develop a single, integrated toolkit that can be used for different purposes in different stages of the policy process. No single DSS of this nature currently exists, as can be deduced from the selected examples indicated above. Each of the programmes referred to, as well as various others that are not mentioned here, contain one or more useful elements that could ideally be integrated into one coherent package to serve as such an integrated DSS toolkit.

## DSS SELECTION CRITERIA

Criteria for comparing and selecting decision support tools could include the following objectives that may be in some cases contradictory ( see annexure):

- **Simplicity** : because of the frequently low levels of electronic literacy among decision-makers especially in developing countries, the simpler the user interface is, the better;
- **Cost** : inexpensive DSS tools will for obvious reasons be more popular;
- **Hardware requirements**: computer memory and general capacity are perpetual constraints on decision support systems. The less capacity needed, the more application potential the DSS tool will have, especially in developing countries.
- **Access & maintenance** : access to DSS tools, training opportunities and the maintenance and upgrading of those tools are essential in order to apply the tools concerned optimally. Off-the-shelf software are therefore potentially more useful than specially designed software that needs specialist maintenance and upkeep.
- **Visual images** : DSS tools with strong visual and graphic capabilities, will have a better impact for presentation purposes in developing countries where the levels of literacy are traditionally low.
- **Specificity** : DSS tools that can be applied to achieve specific decision-making objectives are preferred to tools that can only indirectly resolve specific questions of concern;
- **Versatility / flexibility** : DSS tools that are able to address more than one problem, can be applied in different settings for different purposes, and that do not need specialised training, are preferable to tools that don't conform to these requirements;
- **Compatibility** : the level of compatibility and integration of DSS tools with other programmes is essential to optimise application potential. Compatibility with existing mainstream business applications is therefore essential
- **Transparency** : the desire of decision-makers to keep control of the decision-making process, necessitates tools that are relatively transparent and simple, in order to achieve legitimacy in the perception of the decision-maker;
- **Scientific rigour** : the more rigorous the scientific base of the tool, the more reliable it would be.

## CONCLUSIONS

A variety of electronic public policy decision support approaches and systems exist and are used or are under development in various countries to try to enhance the quality of policy decisions and outcomes. The following questions are, however, still outstanding :

- ◆ What electronic decision support systems are predominantly used in the public sectors in the different countries, by whom, how widely and for what purposes ?,
- ◆ how effective are these practices, ie what is their impact on public services decision-making and delivery outcomes ?
- ◆ how relevant are they for and how appropriate can they be utilised in South African and other developing conditions ?, and
- ◆ what other similar or new systems are under development or contemplated to facilitate policy decision-making, and how can they benefit South African public policy processes and outcomes ?

Research should be actively encouraged into the recording, publication and regular updating of a database and directory of public policy decision tools that are available or under development, the simplification and refinement of current tools, the development of new tools, the integration of different tools and the expansion of more narrowly focused tools into more comprehensive ones in order to increase their potential for application should be actively encouraged by scholars and practitioners alike, in order to improve the quality of public policy decision processes and outcomes. Systematic orientation and training of decision-makers as to the need for and use of these tools for decision support should also be undertaken, in order to improve the quality of good policy governance in the public sector.

The suggested research will undoubtedly also stimulate further research into new applications for these technologies, in order to improve the service delivery results of public policy decisions. This research focus can therefore potentially have a direct impact on the improvement of public policy and especially services delivery at grass roots levels, as policy decision-makers at all levels are empowered to take more informed and confident decisions about complex policy issues, by using available electronic decision support systems appropriately. Exposure of less literate officials to less complex tools will also facilitate the migration of such officials after some time to more sophisticated mainstream decision support tools.

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