Annexure 10 - The Governance and Human Resourcing Report in respect of the Feasibility Study for an e-Education Initiative in South Africa

Contents

1 Introduction

Appropriate governance and administrative models are important in ensuring that programmes and initiatives of this magnitude are successful. The governance model of the implementing body must incorporate transparency, equity, efficiency, dedication to cost effective operations and compliance with public sector reporting and monitoring where applicable.

Considerations for an appropriate governance structure need to take into account the following:

1) Other relevant project governance models, both internationally and locally, in order to consider best practices and lessons learnt.
2) The recommended procurement strategy and management model for each Pillar. The Due Diligence report sets out in detail the recommended procurement strategy for each Pillar of the e-Education Initiative. The governance and administrative model needs to build on this and therefore a high-level summary is provided in this report in order to put the overall governance structure in context.
3) A range of governance and administrative models that may be applicable to the e-Education Initiative.

Each of the above is discussed in this document below, before a recommended governance structure for the e-Education Initiative is proposed.

2 Other Project Governance Structures

2.1 Introduction

Desktop-based research was performed on other relevant project governance structures in order to consider best practices and lessons learned. This included a review of the governance structures for the Turkish Ministry of National Education, Western Cape Department of Education and its Khanya project, the British Educational Communications and Technology Agency (Becta), the Malaysia Smart Schools Programme, Chile's Enlaca project, the Expanded Public Works Programme, and the FET Recapitalization Fund.

2.2 Turkey Ministry of National Education[1]

2.2.1 Background

In Turkey, the number of students at all levels, including non-formal education, is about 19.5 million, the number of educational institutions 67,000, and the number of teaching personnel, including those in higher education, 710,900. In primary education 10.5 million students are provided education by 399,000 teachers in 35,581 schools. Turkey's population is 67,803,927 of which 30% consists of people under 14 years old. Data from 2000 revealed a rate of population increase of 18.28%. There is rapid migration from rural to urban areas.[2]

The Ministry of National Education (MONE) is charged with the responsibility of reaching goals set for Turkish National Education on behalf of the state. The organization of the Ministry of National Education consists of four parts:

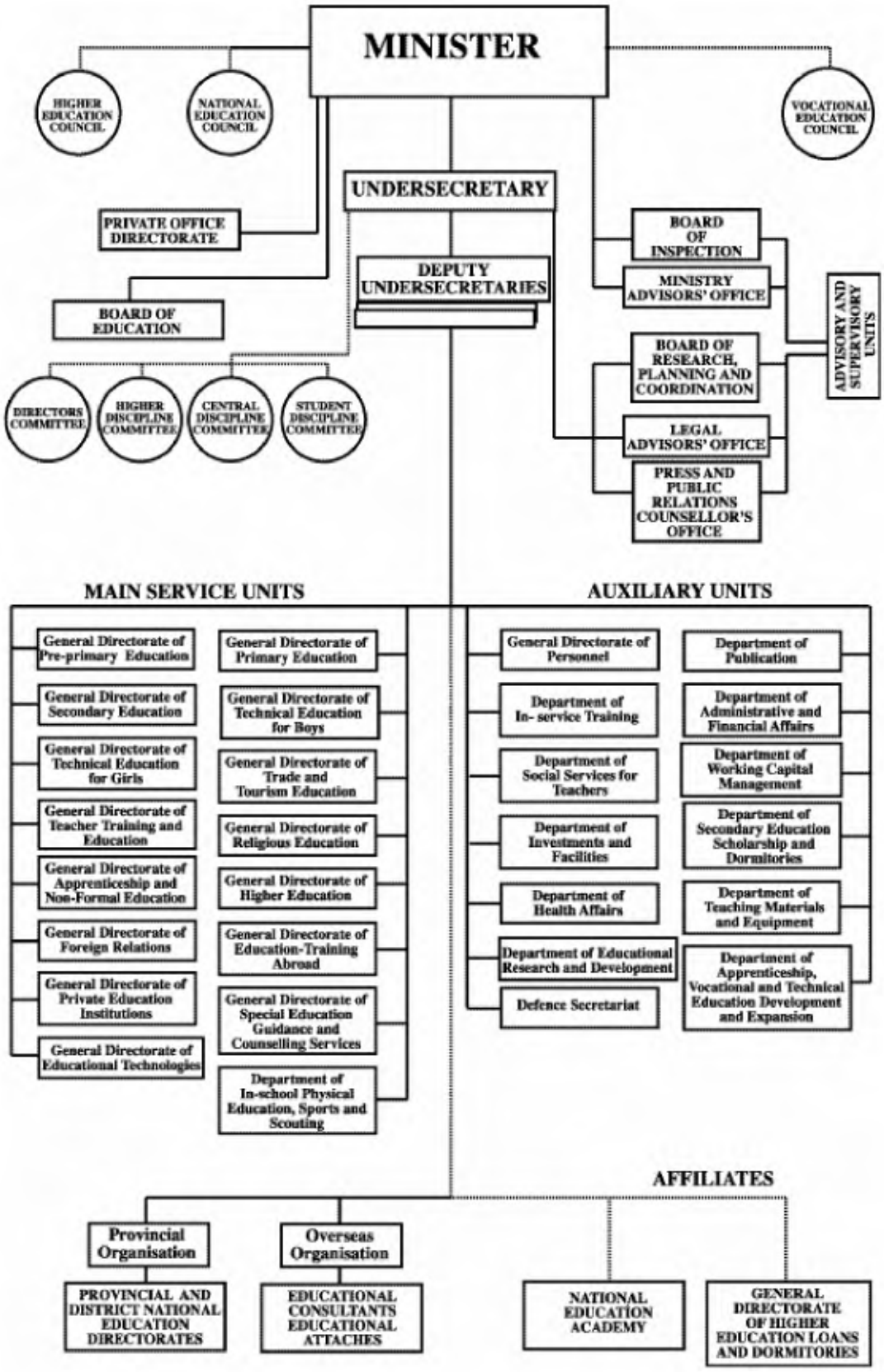
- The Central Organization;
- The Provincial Organization;
- The Overseas Organization; and
- Affiliated Organizations.

The central organization of the Ministry comprises the Ministerial Office, the Board of Education and Discipline, main service units, advisory and supervisory units, auxiliary units and the Project Coordination Centre established at the approval of the Minister. The Board of National Education is a scientific consultation and decision-making body directly affiliated to the Minister.

The diagram below depicts the organizational chart of the Ministry.

[1] Source: Basic Education in Turkey BACKGROUND REPORT, prepared by OECD Secretariat, based on a review performed in 2003

[2] Source: Basic Education in Turkey BACKGROUND REPORT, prepared by OECD Secretariat, based on a review performed in 2003



The Ministry of National Education has provincial organizations in 81 cities and 850 districts. There is a directorate of national education in each province and district. The national education directorates in districts are responsible to the provincial national education

directorates in terms of duties and services. They carry out education services on the basis of province and district. Provincial and district directorates consist of branches, bureaus, permanent boards, and commissions according to the characteristics of the service.

Use of information technology in education in Turkey started with establishment of the 'Specialized Commission on Computer Education at Secondary Schools' by the Ministry of National Education in 1984. Activities up to 1990 included purchase of computers, development of software, and in-service training of teachers serving at general and vocational secondary education institutions. Significant developments occurred in computer-assisted education between the years 1990 and 1999. Within the framework of the 'Project on the Development of National Education', which was implemented with support of the World Bank, two project were conducted with the purpose of the expansion of use of computers, and computer assisted education. One on 'Computer Piloting Schools' covered 53 schools and another on 'Computer Laboratory Schools' covered 182 schools. As part of this process, new goals were determined for 2000. Besides establishing computer laboratories at schools and expanding computer assisted education, the Information System of the Ministry of National Education (MEBSİS) was established in order to automate provincial and district educational directorates of MONE by making use of information technology and connecting them to the central organization through information networks. MEBSİS aims to deliver the services of MONE on time in a cheaper, faster, and more accurate way by making use of information technology.

As part of this initial process, 7,000 computer teacher counsellors and 460 computer training teacher counsellors have been provided in-service training activities to give them the necessary qualifications to be able to pioneer use of information technology at educational institutions. It was ensured that approximately 56,000 teachers were given face-to-face education on information technologies by computer and computer training teacher counsellors. As of 2005, 100,000 teachers were to have received education on information technologies through distance education.

Technical support centres for schools will be established in order to provide necessary technical support for the updating and continuous maintenance of IT hardware at schools.

2.2.2 The General Directorate of Educational Technologies

The General Directorate of Educational Technologies (established in 1998) is one of 44 units of the Turkish Ministry of National Education, which serves schools throughout Turkey. It is responsible for adapting and applying the most recent technologies into the Turkish education system. It provides teachers and students with the latest technological developments, setting an effective learning environment. The General Directorate of Educational Technologies also conducts research and evaluation, as well as developing implementation plans to establish an efficient relationship between formal education and open and distance learning. It processes official placement and graduation examinations, as well as enabling data processing through central and regional offices of the Ministry of National Education.

The main functions of the General Directorate of Educational Technologies include the following (MONE, 2005):

- Conducts research, project, development, follow-up, and assessment and evaluation studies to support education with technological developments, and to plan for extensive use of technology in education.
- Offers educational opportunities throughout the country and in some international centres via distance education.
- Produces or purchases visual, auditory, printed, and computer-based educational materials.
- Establishes computer laboratories in schools, trains related personnel, and offers maintenance services.

2.3 British Educational Communications and Technology Agency (Becta)[3]

2.3.1 Objective

The Department of Education and Skills (DfES) is the related education policy-making structure, whilst the Local Education Authorities (LEAs) of the four education departments of England, Scotland, Wales and Ireland are responsible for implementing policy. The LEAs implement ICT policy with assistance of a statutory body known as the British Educational Communications and Technology Agency (Becta). Becta, in turn, uses other statutory bodies, such as the National College for School Leadership, the Specialist Schools and Academies Trust, Qualifications and Curriculum Authority, and the Training and Development Agency, to assist it with its mandate.

DfES funds initiatives for schools in the United Kingdom to reach e-maturity (appropriately integrating ICT into teaching, learning, management, and administration). ICT in Education in DfES is managed at national level by four dedicated divisions:
- ICT in Schools Division;
- Lifelong Learning Technologies Division;
- Learning Technologies Division; and
- E-learning Strategy Unit.

The DfES has formed a partnership with Becta, and they have a joint goal of transforming education through exploitation and embedding of technology in learning and teaching, in educational organizations, and in developing wider education networks and systems.

Becta is a UK non-departmental, public agency which supports all four UK education departments in their strategic ICT developments. Becta provides strategic leadership in innovative and effective use of ICT to enable transformation of learning, teaching, and educational organizations for the benefit of every learner.

[3] Harnessing Technology Delivery Plan (Becta), Management of change HR policy document www.Becta.org.uk , Memoranda of Understanding and DfES priorities letter (Becta), Becta Board Meeting – Paper 2 – Developing Becta's proposition to DfES, Quinquennial review of the British education communication and technology agency (Becta) October 2002 by Department for Education and Skills, Staffing structure www.Becta.org.uk .

Becta offers professional and technical advice and expertise to support the British Government in achievement of its objectives for ICT in education, further use of ICT in education, raise education standards, and improve effectiveness of education professionals and institutions.

Becta is funded largely by DfES grant-in-aid and grants on a project-by-project basis. A contractual agreement outlines conditions that Becta must meet to receive funding. A DfES/Becta memorandum governs day-to-day financial arrangements and the respective roles of the DfES as Principal Accounting Officer and Becta as Accounting Officer of the Agency.

Funding is largely on provided a project-by-project basis.

2.3.2 Scope

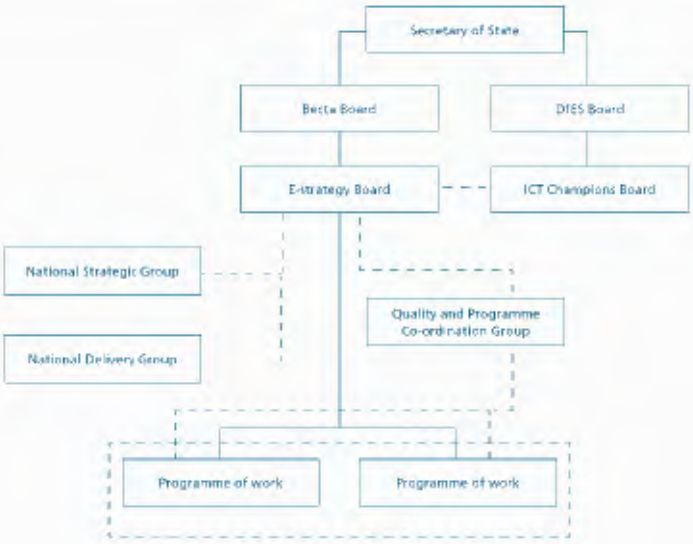
Becta covers the entire United Kingdom. The scope of its work includes construction, developing the content structure and design of the national grid for learning, assisting and simplifying provisions of appropriate support and guidance, undertaking or commissioning innovative and independent evaluation, supporting effective use of ICT in primary and secondary curriculum subjects, supporting development of new information and learning technologies in the further education sector, and keeping abreast of developments in new technologies and their use in education in other countries.

In schools, Becta is responsible for leadership and management, curriculum, professional development, extending opportunities, designing ICT rooms, digital resources, educational portals, technical support, and procurement.

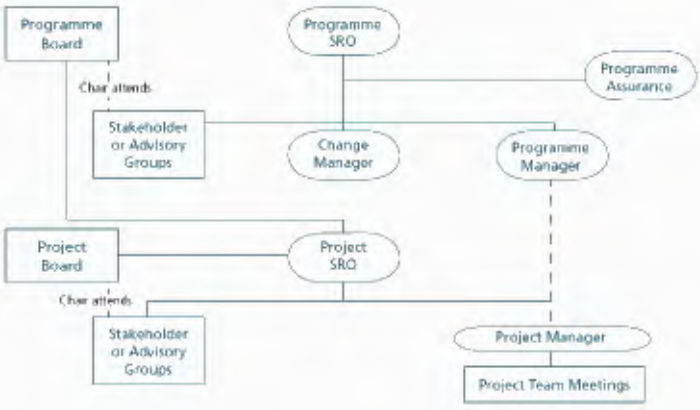
2.3.3 Management Structure

The e-strategy is an overall change programme with a wide portfolio of delivery programmes and projects focused on realizing its outcomes. The programme can be divided into two broad categories of activity, those directly managed by Becta and those managed by partners, with Becta monitoring and identifying overall progress against the strategy's targets.

Those programmes of work directly managed by Becta will have the following governance structure:



Where work will be carried out by partners, the formal governance model is as follows:



The Secretary of State appoints the Becta Chair and Board Members. The Board of DfES oversees Becta's work. Currently, there are ten members on the Becta Board, including the chair. The Becta Board includes people with specialized knowledge and experience in pedagogical skills, education, government (local and central), curriculum, subjects, ICT expertise, marketing, and current technical experiences. The DfES appointed five assessors to the Becta Board to assess progress, oversight, and communication.

Whilst its main role is internal to the DfES, the ICT Champions' Board has an important and helpful role to play in Becta's governance process as it provides a route for Becta to raise issues about how Departmental policy and activities impact on progress. It is responsible for building the Department's internal IT capability and responsible to ensure that services enabled by technology are designed around the needs of learners.

Closely linked to the ICT Champions Board is a sponsor team that carries out monitoring and provides support to Becta as a non-departmental public body, outside the structure outlined above. Becta also provides advice and expertise to the ICT Champions' Board.

The E-strategy board is responsible for management of the programme and the chief executive chairs this board.

Becta's Chief Executive is the senior responsible officer for this programme and holds overall accountability for the e-strategy as a change programme. Part of the Chief Executive's office is a director for Evidence and Evaluation, Learning and Teaching, Institutional Development, Educational Development, Infrastructure, Communications, Corporate Resources, and Board and Corporate Affairs. As part of the team to support the director functions are assistant directors, consultants, advisors, a project senior responsible officer (SRO) with overall responsibility for the project, and the project manager (who is accountable to the project SRO).

Other members include the E-strategy Programme Director (overall planning and management of the programme), E-strategy Programme Manager (coordination and monitoring of portfolio of programmes and projects), and Change Manager (provide the bridge between the programme and business operations). The E-Programme Support Office provides support for the programme board, related projects boards, programme manager and change manager. The E-strategy Programme Office provides support to the Programme Manager and coordinates all information, communication, monitoring, and control activities.

In the initial phase (2001), Becta had a core full-time equivalent staff of 98, supplemented by a further 73 staff employed on fixed term contracts. The number on fixed term contracts reflects the amount of project-based work that Becta undertakes. Becta currently has more than 300 full-time staff members.

Many schools appoint an ICT champion as a member of staff. The responsibilities of the ICT champion are to oversee, guide, and train teachers to use equipment (such as learning platforms, voting systems, and software) within their subject areas and for assessment purposes. The focus is not on technology, but on a sound underpinning pedagogy. The ICT capacity of teachers is developed *within* subject areas. This implies that subject specialists are also ICT and digital content specialists who offer development to teachers in both areas.

Becta makes available a range of EU procurement frameworks through which purchases can be made. These offer:

- A range of suppliers who understand the needs of schools;
- Products and services delivered at a standard set by Becta;
- A simplified purchasing route that ensures compliance with EU procurement laws;
- Consistent contractual terms with controlled local flexibility;
- Ongoing monitoring of suppliers;
- Reassurance that the Becta will arbitrate when conflicts arise;
- Better value from purchases through aggregation, monitoring of suppliers, and consistent terms and conditions; and
- Products and services supplied that meet educational standards and specifications.

Schools are given extensive autonomy to make decisions regarding ICT implementation. They can decide on specialization fields and are provided additional funding based on ratings of the value they add to teaching and learning and learner performance. If schools do not meet set annual targets, they are excluded from additional funding from government. A

bottom-up decision-making approach prevails through the system, which appears to add greater value to the teaching and learning process.

2.3.4 Lessons Learned[4]

In a review of Becta, the following comments were made:

- Becta should be more outward-facing, particularly in the way that it interacts and works with its customers, especially those in schools;
- Becta should provide additional forms or direct advice and support for local education authorities, schools, and further education and lifelong learning communities;
- Becta should increase activity to enhance the promotion and sharing of good practice; and
- Becta should introduce more robust performance measures and its delivery against these measures should be regularly monitored and challenged by the DfES.

Weaknesses identified included:

- Inconsistency in the service given;
- Some material has been received late;
- Useful information existed that was not being circulated at the earliest opportunity;
- The relationship with the Qualification, Curriculum and Assessment Authority for Wales and subject associations needs to be improved to ensure a greater shared understanding and consistency in delivery across the range of subjects);
- A need to make a wider audience aware of its range of services and the sources of information available;
- Need for a mechanism to ensure that stakeholders and customers needs and expectations were being addressed and were not unmet; and
- Need for stronger strategic relationships with a range of key external organizations.

Becta's strengths, which are worth taking into account in developing a South African management model:

- Becta is independent, understanding both the public and private sector's requirements to implement government initiatives and disseminate examples of good practice;
- It provides useful support materials;
- The ICT newsletter is a valuable source of new information;
- The Special Education Needs team within Becta is able to find out immediately through its ICT systems what is happening in the classrooms and schools and respond; and
- Becta's relationships with majority of other key stakeholders are satisfactory.

2.4 Malaysia Smart Schools Programme[5]

2.4.1 Objective

Under the Smart School Project, the Malaysian government aimed to capitalize on the presence of leading-edge technologies and rapid development of the Multimedia Super

[4] Quiquennial Review of the British Educational Communications and Technology Agency (Becta) 1 October 2002

[5] Benchmarking of the Smart School Integrated Solution, Multimediation, Malaysia Prepared By Development Corporation.

Corridor (MSC) infrastructure to jump-start deployment of enabling technology to Malaysian schools. A joint venture company, Telekom Smart School Sdn Bhd (TSS), was incorporated in June 1999 with the objective of transforming the Malaysian education system into a technologically advanced one.

Government awarded the TSS a contract to implement the Smart School solution at 90 pilot schools nationwide. The pilot was completed in December, 2002. The country hopes to roll out the Smart School Integrated Solution (SSIS), developed by the Ministry of Education and TSS, to all of Malaysia's over 9,000 schools by 2010. The pilot schools are expected to serve as the nucleus for eventual nationwide rollout of SSIS, which includes the teaching concepts and materials, skills and technologies.

The Smart School Integrated Solution (SSIS) was rolled out to 87 pilot schools in the country at a cost of about $78 million (RM 300 million).

2.4.2 Malaysian Research Study

A study was undertaken in an attempt to benchmark the SSIS, which forms the bulwark of Smart School, a flagship project promoted by the MDC under the MSC initiative of the Malaysian Government. The benchmarking study, commissioned by MDC for the Ministry of Education (MoE), Malaysia, offers a comprehensive comparison between the Malaysian Smart School Integrated Solution with similar implementations in two other countries – New Zealand and Ireland. The study also offers a broader framework of best practices in ICT-mediated education in secondary schools in a number of other countries – Australia, Britain, Canada, Singapore, and the USA – where ICT-enabled education has reached a considerable level of maturity. Thus, eight countries (Australia, Britain, Canada, Ireland, Japan, New Zealand, Singapore, and USA) were used to benchmark their best practices in ICT-mediated education with that of Malaysia.

In several countries that were reviewed for the study, ICT mediation began as small-scale projects. This started by building some sort of ICT infrastructure in schools, accompanied by professional development of teachers. It was followed by development of a communication infrastructure and online content. Meaningful integration of ICT with education followed. There are several examples that serve to illustrate this approach. All member countries of the Eurydice network in the European Union followed the sequential approach. All of these countries are now on the verge of the transformative phase, which focuses on transforming the way in which people learn.

In Malaysia, building an ICT infrastructure in schools is entirely funded by the government and has a centralized project and risk management structure. Whether the government can sustain such investments for rollout to 9,000 schools is by itself a significant topic for discussion.

In New Zealand, schools bear the bulk of the burden for creating and maintaining their ICT infrastructure, but not without support of the community. In Ireland, the government contributes only up to 50% of total infrastructure expenditure for schools, while the rest is derived from the community. There are several private initiatives in both countries to build

ICT infrastructure in schools. Intel, for example, runs Ireland's ScoilNet, the Web site for schools.

An initiative of this stature cannot be implemented by the Ministry of Education alone in any country. In the USA, such programmes are largely district level, in New Zealand, they are cluster-level, in Australia, state-level, and in India, community level. ICT integration is too big a task to be implemented by a single entity.

Collaboration between public and private sector and educational institutions is not uncommon. However, governments refrain from interfering in their commercial dealings. Its role in defining the framework and constituents of such consortia is very limited. This approach has encouraged the private sector, including commercial institutions to come forward and propose a number of projects.

The table below provides a summary of governance and implementation models.

Malaysia	New Zealand	Ireland	Others
No single system Components: 9	No single system 6 to 8	No single system 4 to 6	No single system 10 to 12
Teaching & Learning: Govt. directed	Restricted govt. role	Restricted govt. role	Restricted govt. role
Infrastructure & Technology: Streamlined	Disparity between schools	Uneven distribution of ICT infrastructure	Uneven distribution of ICT infrastructure
Fully integrated, interoperable systems	Systems disparate, though standards based	Systems disparate, though standards based	Systems disparate, though standards based
Extensive security policy	Limited security policies	Limited security policies	National level Internet security policies
Centralized project & risk management	Not available	Managed by teachers in lead schools and private sector	Not available
Change Management: Low Priority	High Priority	High Priority	High Priority
Support services: Nationwide	School, District & National level	School, District & National level	School, District & National level

2.5 Chile (Enlaces)[6]

An early and transcendental decision in Enlaces was identification of a small team of highly motivated professionals to initiate and lead development of the ICT Programme from the early definitional processes into its later stages, leading toward a larger provincial launch and then to the national scale. Based on this experience, it is advisable to assemble a team with a solid educational and technical background and with strong leadership and political backing, so it can remain relatively unhindered by continuous political change.

[6] Technology in Schools: Education, ICT and the Knowledge Society by Pedro Hepp K. Enrique Hinostroza S. Ernesto Laval M. Lucio Rehbein F. October 2004

An ICT policy requires stability so that the professional team in charge of its implementation can build capacity, mature its expertise, and accompany the programme from its very early stages. This team is referred to as the Management Team.

According to the Chilean experience, the Management Team should be composed of a mixture of expertise and backgrounds. Professionals such as educators, psychologists, project managers, engineers, and graphic designers can play important roles in a core team for an ICT programme. It is advisable to include academic experts in education, as well as experienced teachers who have used technology in their classrooms.

A short description of the roles these professionals have played in Enlaces is listed below:

- Educators were in charge of defining the diffusion and training strategies inside each school category (i.e. urban and rural, primary and secondary). Experts in curriculum design, school administration and educational technology were hired, along with seasoned teachers, some with classroom experience in using ICT.
- A mixture of innovative academics with sound theoretical backgrounds in ICT, together with practitioners, provided a desirable combination of forward-thinking and realism. For example, in Chile, it is common to find teachers dealing with 40 or 50 students in one classroom with no extra time to engage in training or without a real motivation to modify their teaching procedures because of the presence of ICT. The staff development policy had to take into account these kinds of situations.
- Educational reforms worldwide have often encountered a very tough and conservative reality when trying to change teaching and learning strategies. Therefore, innovation efforts need very careful planning as well as a thorough understanding of the educational reality to be addressed. It was essential for the core team of educators in Enlaces to invest in acquiring some knowledge in educational innovation. However, innovation inside the classrooms was much more difficult to achieve than expected by the Enlaces team.
- Educational psychologists contributed, along with educators in the team, to strategic planning for ICT integration in schools and into the teachers' daily practice. One of their main tasks was to adjust the training strategy and to prepare teacher trainers to address teacher's beliefs and their level of self-confidence related to use of ICT in schools. Also, they had to address a number of myths aroused by fear of technology (for example, teachers 'being replaced' by machines, or teachers feeling intimidated or incapable of handling technology).
- Programme managers were in charge of budget planning and control, procurement procedures, programme evaluation processes, legal aspects, and staff hiring. This group also included necessary personnel to undertake secretarial and janitorial work required by the management team and upkeep of the program's headquarters.
- Engineers were needed in three areas of expertise in Enlaces: (i) hardware experts, capable of defining hardware configurations, maintenance procedures and services; (ii) telecommunication engineers for both local networks and Internet services; and (iii) software engineers, for supporting content development in both CDs and web-based platforms.
- Graphic designers with software and web production experience were helpful in defining the programme's marketing strategy, the look and feel of CDs and web-based material developed in-house, and the format of the programme's documents and media-related communications.

Although there were specific responsibilities assigned to each professional group, the tasks of the ICT programme required integration of the expertise of all of them. For example, while designing the teacher training strategy, teachers defined the method and content, managers contributed with the logistic dimensions, and engineers analysed technical requirements imposed by the strategy. The Management team encouraged, from the beginning, multi-disciplinary teamwork and a culture of collaboration.

Also, (and only recently implemented in Enlaces) the Management Team was assisted by a high level External Advisory Board consisting of qualified people from business, academia, and government, as well as a few external, ideally international, experts without personal commitments with the ICT Programme. This Board was intended to be capable of providing feedback, constructive criticism, and long-term direction. Enlaces was often accused by political and business opinion leaders of not taking them enough into account. A board – together with a communication strategy – thus provided a two-way channel to inform and listen to interested parties.

Because there is a requirement for human capacity-building in the long term, the Management Team needed to be allowed to transcend short-term decisions at the political level. Therefore, it was necessary to house this team in an institution that offers stability, independence, and enough manoeuvrability to establish flexible links with government (integration with high-level educational policies, budget definitions, procurement standards and procedures), academia (research, evaluation, training), and the private sector (procurement, donations, community involvement).

Costa Rica decided to establish the Omar Dengo Foundation which is linked to the Ministry of Education for its long-standing ICT initiative which began in 1987. Chile developed its Enlaces programme (since 1990) with strong links between the Ministry of Education and a group of public and private universities from all over the country. Most of the Enlaces' core team has served during three presidential terms and seven Ministers of Education.

Both, Omar Dengo and Enlaces were able to prevail over time, gradually refining their work, and extending their reach.

2.6 Khanya Project of the Western Cape Department of Education[7]

2.6.1 Objective

The objective of the Khanya project is to ensure that every educator in every school in the Western Cape is empowered to use appropriate and available technology to deliver the curriculum to every learner in the Western Cape by the start of the 2012 academic year. The Khanya project is curriculum-driven, and thus not focused solely on providing technology.

[7] Kobus Van Wyk, http://www.khanya.co.za

2.6.2 Scope

The Khanya project includes 1,570 schools, 27,000 educators and one million learners.

2.6.3 Management Structure

Khanya is run as a project within the Western Cape Education Department (WCED). The WCED directs the activities of the Khanya project through a governance structure consisting of:

- Steering Committee: The highest authority, chaired by the Superintendent General of the WCED. The Committee determines Khanya policy and direction, and adjusts the vision of Khanya when determined by changing priorities. Other members of the committee are drawn from senior officials within the Provincial Administration of the Western Cape. The members are the MEC for Education, the SG for Education and two DDGs, the SG of Finance, and representatives of the Audit and IT branches.
- Executive Committee: This Committee consists of the Directors of Curriculum Development, Procurement, Personnel, Finance, and Information Technology. It meets once a month and monitors project expenditure and progress, as well as giving direction on day-to-day implementation issues. This Committee coordinates the project in a more direct way.
- The project champion takes an active interest in the project, promotes its cause, and attends both the Steering Committee and Executive Committee meetings. The project champion is the DDG for Curriculum Planning, who is also chairperson of the Executive Committee and serves on the Steering Committee.

The project is managed by a project manager who maintains a flat organizational structure. The project structure also reflects a matrix, determined by region and function. The main management functions are: project support, technology implementation, e-school establishment, and funding and PPPs. These comprise the following personnel:

- The Project Manager manages the Khanya project and attends and reports to both the Steering Committee and Executive Committee (the project manager also reports to these committees in behalf of the various sub-project managers).
- Funding and Private-Public Partnerships coordinator: a special function was created within Khanya to establish necessary partnerships from a funding and delivery perspective.
- ICT/Technology Implementation Coordinator: this person oversees installation and maintenance of hardware and software.
- E-Education/E-school Establishment coordinator: once technology has been installed, the school needs to be transformed into an e-school. Aspects covered include e-teachers, e-learners, e-administration.
- The Project Support Office team administers the project, is managed by a contract project office administrator, and is staffed by contract administrative staff, as determined by workload. The project support office takes care of all project administration, such as finances, personnel matters, filing, and project plan maintenance.

The Khanya project operates organizationally in a matrix structure, where staff members operate in different teams. A regional coordinator (EMDC) coordinates the activities of each person, but, from a task perspective, the same person's activities can be coordinated by a

functional coordinator. Khanya has seven EMDCs, one for each of the regions in the province.

A senior member of the team coordinates activities in each of the EMDCs. This EMDC coordinator also liaises with management structures within the particular EMDC to ensure close cooperation. Such an EMDC team typically consists of one or two Implementation Project Managers and a number of Specialist Facilitators (one for every 20 schools). The Implementation Project Manager ensures rollout of e-resources and does site management. Specialist Facilitators include curriculum facilitators, who act as change agents, as well as temporary subject advisors. Over time, the Khanya project plans to transfer the subject advisors' skills from the Specialist Facilitators to the WCED.

To ensure uniformity, an Implementation Project Coordinator coordinates activities across the different EMDCs. This ensures that lessons learned in one area are available to others and that a high standard of deliverables is maintained. Similarly, the E-education Coordinator oversees the work that all EMDC coordinators and facilitators are performing to ensure that the same policies are adhered to throughout the project.

The matrix structure means that the Khanya project is not owned by any WCED Directorate. Rather, it cooperates with these Directorates, drawing on WCED staff and experience. The products and developed functions will eventually be handed over to the relevant WCED Directorates.

The Khanya project is managed by full-time contractors with no other departmental roles and responsibilities. There are no part-time employees.

At a school level, Khanya uses two full-time educators (those who show most interest in ICT) to help with the ICT physical environment (servers, backups, power, LAN administration, paper jams, and so on). Other duties include overseeing development of an ICT policy by the school governing body.

In the Khanya project, the technical support technicians and helpdesk functions do not form part of Khanya project as these roles are fulfilled by WCED through the E-Innovation Directorate.

2.6.4 High-Level Implementation Overview

The Khanya project is implemented through a series of manageable sub-projects. Each of these sub-projects is defined in terms of scope, deliverables, required resources, and time frames. No technology installation takes place unless it can be linked, directly or indirectly, to curriculum delivery.

The Khanya Project Manager initiates sub-projects. For each one, he develops a Project Charter, which is presented to the Executive Committee for approval and the Steering Committee for ratification. Once approved and ratified, the sub-project manager will draft a detailed plan for the sub-project, which will be approved by the Khanya Project Manager and then presented to the Executive Committee for final approval (the sub-project will not start unless a suitable sub-project manager is appointed). Each sub-project has measurable

objectives, discrete deliverables, a specific budget, and fixed duration (ideally between one to three years).

2.6.5 Lessons Learned

Sustainability issues that needs to be taken into account are: financial (how the school will be able to afford running costs of the facility, its upkeep, maintenance of equipment, and replacement of components once they have reached the end of their useful life); technical (do school staff have enough technical skills to run the facility successfully once initial project support is withdrawn?); operational (can one be sure that, in a year or a few years' time, the facility is still used for its intended purpose, and that it has not become a white elephant to the school?); and environmental (issues such as energy conservation and a policy of disposal once hardware has become obsolete).

Another challenge in the Khanya project is that, for schools to be technically sustainable, it is necessary that they reach a sufficient level of technical maturity that they can take charge of their own technical destiny. The WCED and Province do not have enough technical resources to support all schools, so the only way forward is to empower as many staff members in the schools as possible to fulfil this role. A start has been made in the Khanya project, but this remains a challenge.

One of the Khanya successes is having the right people at the right level. A key part of Khanya's recruitment was to identify people with appropriate experience. For example, facilitators must have twelve years of teaching experience.

2.7 Gauteng Department of Education and the Gauteng On-Line (GoL) Project

2.7.1 Objectives

The GoL project was established in 2003 to provide a computer laboratory to each public school in Gauteng, with initial emphasis on those schools in the most disadvantaged communities. The GoL initiative also included orientation training for all educators at all GoL schools, as well as advanced training of two educators per school. The key aim of GoL is to deliver e-learning in Gauteng's public schools.

The Gauteng Department of Education's (GDE's) key objectives for the project include:

- Creating a sustainable school-based e-learning environment where learners and educators make the most of their educational experience in an effort to bridge the current digital divide and expose South African learners to international trends in accessing and sharing information;
- Providing needs-driven ICT to schools as the platform for implementation of e-learning activities; and
- Developing capacity, skills, and competencies within both the GDE and schools to ensure that e-learning outcomes are achieved and the programme is a success.

2.7.2 Scope

GoL covers all 2,220 public schools in Gauteng. It includes construction of new laboratories or refurbishment of existing classrooms, deployment of ICT equipment, and installation of software, internet connections, and training of educators.

More specifically, GoL addresses the following specific areas:
- Connectivity (email and internet);
- Infrastructure;
- Selection of Software;
- Training during rollout;
- Social facilitation (choice of classroom, integration);
- Security (physical, computer information); and
- Support for principals.

Costing includes all these specific areas, except consumables, which must be paid for by schools.

GoL did not initially include curriculum, content, monitoring, evaluation, or research, as well as the various learner and educator options included in this e-Education Initiative However, these have been included from April, 2008.

2.7.3 Organizational/ Management Structure

GoL was initially run as a project within the GDE with limited manpower resources. GoL was managed by the Chief Information Officer who reported to the HoD. There were two full-time project managers (one for infrastructure; the other for computer equipment, social facilitation, and training).

As part of rollout, (phases 1-6 of GoL project) there was a District Steering Committee, made up of two officials per district. They worked part-time for GoL, and were managed by one of the two GDE project managers. They were not paid extra, but have been issued with cameras and laptops, and their responsibilities were centred on rollout. They had to assist contractors with access to schools, facilitate communication with schools, ensure school representatives attended meetings, and assist with handover of laboratories to schools.

These responsibilities were subsequently transferred to the Gauteng Shared Services Centre (GSSC) from April, 2007. The GSSC now acts as the rollout and implementation agent. Since this date, a second steering committee has been constituted under the GSSC, comprising members from the GDE, GSSC, and Nokusa consultants. Their role is to monitor and report on the functioning of the GoL network. The GDE officials are full-time.

The Phase 7 tender has now been awarded to SMMT Consortium. There is a GDE GSSC Nokusa Consulting Committee, which draws up service level agreements (SLAs) for the contract. This committee will be disbanded when the SLAs are completed. The rest of the rollout and maintenance functions are outsourced. With award of the Phase 7 tender, this falls to SMMT and GSSC.

The GoL has a call centre that is run by the GSSC. The GSSC call centre deals with technical and security issues. The security company runs a central command centre, which receives calls from schools concerning functioning of the alarm systems. The SMMT consortium will be taking over call centre functions.

Other committees that have been established, as of April 2008 are:
- Connectivity;
- Training;
- Labour relations;
- Infrastructure;
- Communications;
- Security;
- System Integration; and
- E-learning content development.

These committees will report to the GDE, which will ensure integration into its processes. Each committee consists of nominated people (a Chief Director who acts as a team leader and three or four additional members).

The e-learning and content development committee will be responsible for teacher training, support, and facilitation. The already established GDE e-learning unit collaborates with GoL by participating in the GoL e-learning content development committee. This newly formed structure is aimed at ensuring that curriculum delivery forms the basis for use of ICT in schools. Members of this committee are GDE officials, curriculum and e-learning directorates, GSSC, and GoL. These are appointed individuals dedicated to specific directorates/offices who will be serving on the committee to design strategies for the programme that are relevant to their discipline.

2.7.4 Lessons Learned

Lessons learned include the following:
- The importance of governance in project formulation and implementation;
- Defining clear strategic objectives;
- The importance of contract management;
- Evaluation and improvement of training of educators;
- Need for proper connectivity and networks for schools;
- Need for proper laboratory and asset maintenance; and
- Need for proper physical security.

Major weaknesses are in the infrastructure, particularly bulk electricity supply to schools and unreliable Internet provision. Something to note, though is that a standardized model generates economies of scale and efficiency of training and support.

2.8 FET Recapitalization Grant[8]

2.8.1 Objective

In South Africa, after restructuring of technical colleges, there are now 50 public FET colleges. Public FET colleges were created in 2002 in terms of the FET Act, no 98 of 1998 with the declaration of former technical colleges, colleges of education, and training centres into 50 merged FET colleges.

In 2005/6, Government allocated R1.9 billion over three years for the sector's recapitalization. Budget items included infrastructure, equipment, ICT, and development of professional staff in relation to new programmes, administrative systems, and curriculum reform.[9]

The Directorate for Public and Private FET Colleges has also embarked on a task directive to establish connectivity between the Department of Education and 24 FET Colleges in the Eastern Cape, Kwazulu-Natal, and Limpopo.

2.8.2 Management Structure

The FET recapitalization grant is managed using existing management and decision-making structures. Colleges report into the FET Interprovincial Committee, which reports into the Heads of Education Departments Committee (HEDCOM), and then the Council of Education Ministers (CEM). The project is, however, driven from the national Directorate for Public and Private FET Colleges.

Each College has to develop a three-year ICT strategy plan with outcomes and costs, as well as an annual operating plan. External support is used by the Colleges if required. Each College plan is then reviewed and analysed on a provincial basis to ensure that it is cohesive and fits into provincial plans. A shopping list of equipment is provided on a national basis based on norms and standards, policies, templates and step-by-step guides.

Monitoring by the FET Directorate is mainly done through:
- Quarterly FET Interprovincial meetings;
- Monthly, quarterly and annual reports submitted by Colleges;
- Site visits, used for verification purposes, to strengthen relationships, and to understand practical issues.

Lessons learned in this project include that:
- Simplistic messages need to be communicated.
- Key areas should be focused on using step-by-step guides developed at national level.
- Cash flow management within the MTEF cycle is challenging as roll-overs are not guaranteed. Once a roll-over has been approved, this only leaves a College two months to

[8] Discussions Private & Public FET Colleges Director, Mr Steven J. Mommen.
[9] FET Colleges: Institutions of First Choice, published May 2007, National Department of Education

spend money before the end of the next year. It is therefore important to monitor on a monthly basis actual spend against budget, as well as planned and committed spend.

- Another difficulty is that money flows from national treasury to the relevant provincial treasury, to the relevant provincial Departments of Education and only then to the colleges. This process causes delays in funds becoming available at College level from the beginning of a financial year.

2.9 Expanded Public Works Programme (EPWP)[10]

2.9.1 Objective

The EPWP is a South African National Government programme to address unemployment, increase economic growth and improve skill levels. The EPWP achieves these goals through provision of work opportunities and training.

2.9.2 Scope

Opportunities for implementing the EPWP were identified in the infrastructure, environmental, social and economic sectors and in all spheres of government/ state-owned enterprises and by different departments, depending on which of the four sectors their core mandate falls under.

2.9.3 Management Structure

The EPWP is decentralized, being implemented through existing government structures and within existing budgets. Each public body formulates its plan for using its budget to draw significant numbers of the unemployed into productive work and to provide them training. The EPWP projects are funded through normal budgetary process, through budgets of line-function departments and provinces with a Provincial Infrastructure Grant (PIG), and through the Municipal Infrastructure Grant (MIG) allocated to municipalities by Treasuries for identified infrastructure projects that are amenable to labour-intensive methods.

The Department of Public Works (DPW) was appointed the overall coordinating department for the EPWP. A dedicated unit (EPWP Unit) established by DPW helps to implement the EPWP, with DPW functioning as overall coordinator. The EPWP unit is responsible for day-to-day coordination, support, monitoring, and evaluation.

A National EPWP Coordinating Committee was also established. At the national level, all lead sector departments, as well as National Treasury, the Presidency, Department of Labour

[10] Supporting Local Government Capacity for implementing the Expanded Public Works Programme, 2006, Maikel Lieuw Kie Song (EPWP Unit), Matthew Nell (EPWSP), Singizi Consulting; Practical Guidelines for Replicating the Zibambele Programme, Version 2.1.0, 19 June 2006; Expanded Public Works Programme (EPWP), Third Quarterly Report (containing interim data for period1 April 2006 – 31 Dec 2006), 15 May 2007; Expanded Public Works Programme (EPWP), Fourth Quarterly Repor t- Year 2 (containing interim data for period1 April – 31 March 2006), 4 August 2006; DPWP web site.

(DOL), Department of Provincial and Local Government (DPLG), South African Local Government Association (SALGA), Development Bank of South Africa (DBSA), and the Independent Development Trust (IDT), are represented in this forum. To facilitate coordination between national sector departments and provinces, provincial EPWP coordinators are also represented in this forum.

National Sector Coordinating Committees for the environmental, social, and infrastructure and economic sectors were created to track progress, discuss common challenges, and ensure that there is a common approach to training and exit strategies across the sectors.

Provincial EPWP Coordinating Committees have been established. Provincial EPWP implementation plans set targets, linked to provincial priorities, for projects and job creation across the various sectors. Provincial committees drive the programme.

The support model comprises a PPP, whereby the private sector through the Business Trust has established dedicated capacity in the form of the Extended Public Works Support Programme (EPWSP), a highly experienced technical team that provides support to public sector officials responsible for coordinating and implementing the EPWP. This support is intended to maximize achievement of the programme's targets. The EPWSP enhances and complements the Department of Public Works by providing prioritized support programmes to maximize achievement of the EPWP's targets.

The Business Trust has committed itself to supporting the EPWP for the coming years through establishment of a facilitation fund to the value of R100 million from March 2005 to March 2010. Shisaka Development Management Services (Shisaka) has been identified by the Business Trust and Department of Public Works as its Strategic Partner to develop and manage the EPWSP for the period.

There is a strong team of core staff within the EPWSP with a dedicated programme manager for the programme at a central location. Facilitation Officers are located in municipalities and are tasked with establishing the programme in municipality. Technical experts are then employed on a contract basis to support municipalities to identify project blockages and to develop and implement action plans to address these blockages.

Management at project level rests with the employer and owner of the asset (i.e. a municipality or province). The municipality or province will be responsible for correct implementation of projects and accountable to the Auditor General for funds disbursed. Municipalities and provinces are required to report on EPWP key indicators to DPW via monitoring systems put in place by DPW and DPLG (based on requirements from Treasury).

Conditions linked to the Municipal Infrastructure Grant and Provincial Infrastructure Grant require provinces and municipalities to use the guidelines for implementation of labour-intensive infrastructure projects under the EPWP, agreed upon between SALGA, National Treasury, and DPW during identification, design, and construction.

2.9.4 Lessons Learned

Problems encountered include the absence of infrastructure project implementation systems in municipalities and of lists of projects. Personal interaction with municipalities was conducted too late in the projects to rectify these problems.

The EPWSP's initial point of engagement was generally the Project Management Units (PMUs). However, there was often considerable tension between PMUs and delivering departments, caused by role confusion as to who is responsible for implementing the EPWP. Internal communication between the PMU and relevant line departments was often poor. The absence of a budget meant that PMUs have no leverage over line departments.

There is a need to have a strong central coordination point that can support divisions and ensure that there is a common understanding of different aspects of implementation of the EPWP. This includes the requirement that these units have access to high-level decision-making structures. This coordinating structure should provide direction on issues that need to be taken up consistently within the municipality, as well as to ensure that the different departments are held accountable for achievement of targets and are given support by the municipality to do this.

2.10 Key Considerations in Terms of the e-Education Initiative

It is clear that none of the structures outlined above could be applied as is to the e-Education Initiative. However, many key lessons can be incorporated into the proposed structure for the Initiative. These include:

- To minimize the problem of having provincial Departments of Education being at different stages of ICT development, the Initiative framework should be driven by the national Department of Education from a policy and coordination level and by provincial Departments of Education from an implementation and local support level.
- Investment in ICT can only be sustained if there is a dedicated team of people to drive it. This team needs to be multi-skilled as indicated in the Chilean example. Existing capacity and availability of skills poses a real problem, and is critical to success of the e-Education Initiative. Ensuring that the right skills and experience are included in the e-Education Initiative will be the task of the human resource recruitment process. The recruitment process needs to ensure that it appoints people with appropriate qualifications and experience.
- More coordinated partnership programmes and strategic relationships must be established with the private sector, international agencies, and development agencies in order to strengthen rollout of e-Education.

3 Governance and Management Options

3.1 Governance and Management Functions

The main functions of a management agency for the Initiative will be sector coordination, strategic planning, financial planning, project management, evaluation and monitoring, technical support, asset management, and contract management in relation to the Pillars of the e-Education Initiative.

3.1.1 Sector Coordination

There has to be coordination of relevant activities between various stakeholders, including: the national Department of Education; provincial Departments of Education; the SITA; the NGO sector; the private sector and industry; the Department of Public Enterprises; the Department of Public Service and Administration; SACE; National Treasury; universities; district offices; and schools. This should aim to ensure that roles and responsibilities are defined up front to avoid duplication and confusion. These stakeholders need to contribute in various ways to the implementation plan for rollout of the e-Education Initiative. The stakeholders and their relationship to the e-Education Initiative have been detailed in the Needs Analysis Report.

3.1.2 Strategic Planning

There has to be periodic strategic planning in terms of the goals and objectives of the e-Education Initiative and activities for a five- to seven-year period. Goals need to be formulated as clearly defined practical activities that are carried out in an implementation plan. The management agency, whatever its final form, will be required to report on achievement of its goals in terms of the Public Finance Management Act, 1999, making this activity vital to sustainability of the e-Education Initiative.

3.1.3 Financial Planning

This Initiative will require a large capital investment and substantial investment in operational expense over a long period. The major initial source of funds will be the national budget through the national Department of Education's budget process. The management agency has to plan expenditure to match demand from the sector, ensuring that cash flow, working capital, and other recurrent expenditure are provided for so that purchase discounts and other creditor benefit schemes can be optimized through the life of the Initiative.

3.1.4 Project Management

The scale and complexity of procurement, contracting, and implementation of the e-Education Initiative will demand a sound project management approach so that the management agency can manage multiple, inter-dependent programmes and projects, as well

as the various stakeholders, for harmonized success. This function in the governance model will underpin the success of all others.

3.1.5 Support

The management agency will have to acquire dedicated specialist skills to assist provinces and schools/FET Colleges to implement the e-Education Initiative. The Chile example illustrated that the management team should comprise a mixture of expertise and backgrounds. Professionals such as educators, psychologists, project managers, engineers, and graphic designers can play important roles in a core team for an educational technology programme. It is advisable to include academic experts in education, as well as experienced teachers who have used technology in their classrooms

3.1.6 Evaluation and Monitoring

Evaluation and monitoring play an important role in unearthing serious implementation flaws in any programme or project. This function is closely linked to the project management function.

The management agency must be able to reflect on investments made under various programmes and projects and give direction to government as to whether an investment has been worthwhile. Evaluation of the e-Education Initiative at certain critical points during rollout is necessary to identify strengths, weaknesses, opportunities, and threats. The Initiative must be evaluated or benchmarked for progress against its own goals and selected similar initiatives locally and internationally.

Monitoring is closely linked to all aspects of the e-Education Initiative. A scorecard will have to be designed that can measure performance in these areas against agreed milestones and target dates.

3.1.7 Asset Management

Asset management is the strategy by which goods procured under this Initiative will be kept secure and disposed of once redundant. Asset management will ensure compliance with relevant public sector prescripts for security and disposal of assets.

3.1.8 Contract Management

This function involves managing contracts with the various service providers and funders involved in delivery of the e-Education Initiative. Contract management ensures compliance of service providers with agreed service level specifications and records all legal variations to contracts. In the e-Education Initiative, numerous agreements are envisaged. Compliance and fulfilment of relevant contract conditions in each case will be the responsibility of this agency.

3.2 Agency Models

Given the above functions, the following are possible models that can be considered for a management agency. The agency may be: in-house within the Department of Education; outsourced project/programme management; or establishment of a public entity. In weighing the merits of these models, emphasis must be placed on choosing a model that will expedite the aims of the e-Education Initiative.

3.2.1 Model One: In-House

The in-house function entails establishment of a dedicated unit within the national and/or provincial Departments of Education to manage and procure, as applicable, the various Pillars of the e-Education Initiative.

3.2.1.1 Top-Down Agency (National Deartment of Education)

In this example, governance and management takes place at the highest level of the education hierarchy. The e-Education Initiative agenda is set nationally and should involve consultation with relevant provincial bodies and other key stakeholders.

There are several strengths of this approach. The national Department of Education has the ability to ensure equity in both financing and quality of implementation. It is also able to provide consistency throughout the country, and can ensure that a minimum level of educational support and standards are provided to all schools and FET colleges. It also allows for economies of scale to be achieved through bulk contracting.

The disadvantage of this model is that provincial, school, and College actors may feel excluded or disempowered by the national agenda and unable to influence its direction with their specific requirements and needs, as it can be seen as a one-size-fits-all approach. This may be overcome by using existing cooperative governance structures in the Department of Education, as well as by implementing a joint structure whereby the framework is driven by the national Department of Education with respect to policy and coordination and by the provincial Departments of Education in terms of implementation and local support.

3.2.1.2 Middle-Down Agency (Provincial Department of Education)

In this option, the e-Education Initiative agenda and framework is driven individually at provincial level.

The advantages of this model are that it increases accountability at the implementation level, and can improve quality and relevance. Provincial and district players are more likely to be engaged in contracts which they have requested and funded, as well as being more likely to engage with the findings of evaluation processes and implement recommendations as they are seen as directly relevant to their context.

The main disadvantage of this option is the risk of unnecessary duplication, as each province is investing in design of frameworks, contracting, and approaches. It is sometimes difficult for provinces to take advantage of decentralized management because they neither have the

local expertise nor the resources to handle this responsibility, and often need to rely on the national Department of Education for planning, support, and guidance.

3.2.2 Model Two: Outsourced Management

In this option, most management and administrative functions are outsourced to the private sector, with decision-making remaining with the Institution. Management of this arrangement would be through a contract that should include a Service Level Agreement (SLA). This would then still require a contract management function to be performed by the Department of Education.

Where contract management expertise is brought in from outside the Institution, either on an ad hoc basis or under a long-term arrangement, it will be important to ensure that commercially confidential information held by the Institution is protected. The terms of reference, timeframes, and basis of fees for such advisors must be clearly defined to ensure that management of the Initiative rests with the Institution. Any contract with independent professional advisors providing contract management services must contain clear arrangements for reporting results of performance monitoring to the Institution.

Successful outsourcing engagements are grounded in clarity of the goals that outsourcing is intended to achieve. The nature of a vendor relationship – including contract type, performance measure, and risk-and-reward incentives – must be aligned with an outsourcing initiative's underlying strategic intent. While functions with clear performance expectations and observable results are well served by a contractual agreement, uncertain or risky initiatives are better served through a flexible partnership.

The following functions can potentially be outsourced:
- Project management;
- Evaluation and monitoring;
- Technical support;
- Asset management; and
- Contract management.

Outsourcing can be undertaken on a needs basis and is normally based on short- to medium-term contracts. In the public sector, three years tends to be the maximum agreement term. Benefits are that the Institution obtains quick access to skills and services, more flexibly, more quickly and, potentially, more inexpensively than by developing and maintaining its own capacity.

Various challenges exist. This may limit the Institution's ability to react quickly to changing needs. The service provider is seen as 'outside' the Department and not integrated within the structures and processes of the Department.

3.2.3 Model Three: New Public Entity

Public entities are established in the public sector, but outside the public service, typically for reasons of strategic, social, or economic intervention by the state or to deal with strategic

risks and dangers that the state or society face to security, health, prosperity, or wellbeing; and/or adopting commercial and business principles in service delivery when it is required; and/or signalling that there is need for objectivity and more operational autonomy, yet retaining accountability in the delivery of services.

Alternative structures could be regarded as being 'outside the system', thus weakening effectiveness of this critical resource. Because a key value in the e-Education Initiative is to see use of ICT as part of education and not as an adjunct, we suggest it is important to involve and develop existing structures rather than create new ones.

3.3 Choosing Between Internal and External Management

The e-Education Initiative requires stability so that the professional team in charge of its implementation can build its capacity, mature its expertise, and accompany the initiative from its very early stages. This team is referred to henceforth as the e-Education Unit.

As has been outlined above, this e-Education Unit might either be internal or external to the Department of Education structures. In coming to an appropriate recommendation, two viable models were reviewed for the e-Education Unit: one being a unit within the Department of Education and the other being a new public entity (such as Becta).

3.3.1 Internal

There is merit in considering a dedicated e-Education Unit for the e-Education Initiative which functions as Becta does in support of the UK Education Department. Although Becta is an independent body, it is the preferred service provider for ICT-related monitoring, evaluation, research, and strategy for the UK government. However, it would be unnecessary duplication to form an independent body for the e-Education Initiative, and an internal unit to support this role would be more appropriate. A small dedicated staff complement can provide continuity, and ensure that an overall framework is developed and implemented to serve the e-Education Initiative's objectives. In addition, the internal unit can ensure that the various activities as per the e-Education Initiative are integrated into daily management of e-Education Initiative project management.

The above approach is similar to the established PPP Unit at National Treasury. Below is a summary of lessons learnt from international experience which provided the basis for establishing the PPP Unit:

- In order to be successful, one must have strong regulatory/policy and implementation/ technical assistance structures.
- Support from the highest levels in the government is required.
- Private sector buy-in is crucial.
- Open communication channels must exist between the public and private sectors.
- 'Project development' and facilitation is crucial for deal flow. The public sector must create structures for creating an enabling environment and 'originating' projects.
- A platform must be created where stakeholders can provide inputs to improve quality and quantity of deals.

- PPP expertise is usually not available in the public sector. Structures must be created to import that expertise from the private sector.

The advantages of this option are:
1) The e-Education Initiative will be integrated into the core services and existing lines of decision making;
2) It will better align with the concurrent responsibilities of the Department;
3) The unit will have direct access to the DG and Head of Departments in terms of decision making; and
4) Accountability will be retained entirely within government.

The disadvantages of this option are:
1) There is currently no such capacity within the Institution;
2) A significant part of the e-Education Initiative is not core to the Institution (notably, connectivity and ICT infrastructure);
3) The Institution may struggle to appoint required skills at current notch and salary levels;
4) Funding for the Initiative is not fully ring-fenced and may become disaggregated;
5) Public sector systems may not be particularly suited to or sufficiently flexible for management of an initiative of this size and complexity;
6) Recruitment and retention of people with the required skills for the initiative is a potential problem within the public sector; and
7) This option potentially introduces lack of clarity in financial and management accountability for the Initiative with respect to the existing line functions of the Department.

By integrating the Initiative within the existing structures of the Institution, a significant financial and management responsibility is placed on existing structures, which may impact negatively on the existing line functions of the Institution.

3.3.2 External

While an outsourced programme management unit could take on this role, this has the disadvantage of removing management functions from ongoing management of the e-Education Initiative programmes. This makes it harder to respond to findings emerging from the Initiative and so adapt management practice and project approaches. An outsourced programme management unit would need to report into some Department of Education structure, and this would create an additional bureaucratic layer.

The advantages of this option are:
1) The entity will have a single focus and objective;
2) There can be better accountability, as well as ring-fenced budgets;
3) It provides opportunity to create a new economic class in terms of appointing the resources required; and
4) Procurement may be simplified.

The disadvantages of this option are:
1) The process to establish such an entity in terms of the PFMA will take some time;
2) Various existing structures already exist which will be impacted;

3) Overall integration into the systemic structure of the schooling education system may not be achieved to the desired level as this entity will be separate from the Department;
4) Decision-making may be delayed due to addition of another decision-making layer in the system
5) Systemic transformation may not be achieved, as this needs to be driven internally.

Various options were considered in this regard:
Government Component[11] – This form is suitable for the delivery of a specific measurable function, normally involving routine implementation of policy. It applies predominantly to service delivery institutions, with a unique identity, that has specific measurable functions that can be logically grouped in terms of a particular service delivery model.

It provides an institutional mechanism for the assignment or delegation of government functions to government components within the public service without having to assign functions to a separate juristic person (e.g., public entity) outside the public service.

The head of a government component will be the accounting officer of the component in terms of the Public Finance Management Act (PFMA) which includes the appropriate financial powers. A government component is partnered with a principal department (listed in Schedule 1), which will assist the executive authority with exercising oversight over a government component on policy implementation, performance, integrated planning, budgeting and service delivery (insofar as applicable). This organisational form is particularly useful to effect service delivery as close as possible to the point of service delivery with customised decision making powers, accountability and reporting arrangements as determined by an executive authority. A government component is an organisational form separate from its principal department, but would still fall under the Vote of the principal department.

Advantages include:
1) provides for direct accountability and decision-making as close as possible at the point of service delivery
2) it provides for direct control and influence over service delivery
3) administrative and operational arrangement can be customised to suit a particular service delivery environment
4) provides for the establishment of an advisory board to advise the Minister on service delivery matters and accommodate stakeholder interest
5) surpluses may be retained if prior approval has been obtained from National Treasury (subject to passing of the PFMA Bill)
6) has a separate pay master general bank account under the national revenue fund.

Disadvantages include:
1) establishment subject to completion of prescribed feasibility study recommending the establishment of such a component, consultation with Minister of Public Service and Administration and Minister of Finance and notice in Gazette

[11] As provided for in the Public Service Amendment Act, no 30 of 2007. Published on 17 January 2008 in Government Gazette No. 30675.

2) no borrowing powers[12]
3) staff remains public servants

Public Entity[13] – This form is suitable for functions that require the involvement of stakeholders and experts to ensure effective and efficient service delivery and where a moderate degree of autonomy in decision-making is desirable or where it is necessary to assign decision-making to an independent juristic person in to enhance public confidence in the implementation of a policy framework or the provision of policy advice and research.

Public entities are established in terms of enabling legislation in order to perform functions that have been assigned to a separate juristic person. Public entities must have a governing body, which is also the accounting authority. The governing body is accountable to a specific Minister for the implementation of its public purpose mandate in terms of enabling legislation. Public entities may be funded from the fiscus by means of a grant-in-aid (or transfer), or funded by a range of other mechanisms.

Advantages include:
1) income received may be retained within the public entity if prior approval has been obtained from National Treasury
2) being a separate juristic person has advantages such as the opening of own, separate bank accounts and possibility of entering into certain contracts
3) quicker decision making processes due to increased independence.

Disadvantages include:
1) extensive process to be followed when intending to establish a public entity (i.e. full motivation to National Treasury by way of a detailed business plan; requesting Cabinet for approval to introduce a Bill in Parliament approving initial organisation and post establishment structure for the Public Entity)
2) the requirement of own establishing Act
3) deployment/ transfer of public servants to public entity may invite labour law implications
4) may only borrow, issue a guarantee, indemnity or security, or enter into any other transaction that binds the public entity or the Revenue Fund to future financial commitment if authorised by legislation other than the PFMA.

Government Enterprise[14] – This form is suitable for functions that lend themselves to commercialisation and are 'private' companies registered in terms of the Companies Act, 1973, over which the state exercises ownership control, or in which the state has a material interest. Not applicable for the e-Education Initiative.

Public Interest Institutions – Refers to private institutions that perform public type functions in which government has an interest. Not applicable for the e-Education Initiative.

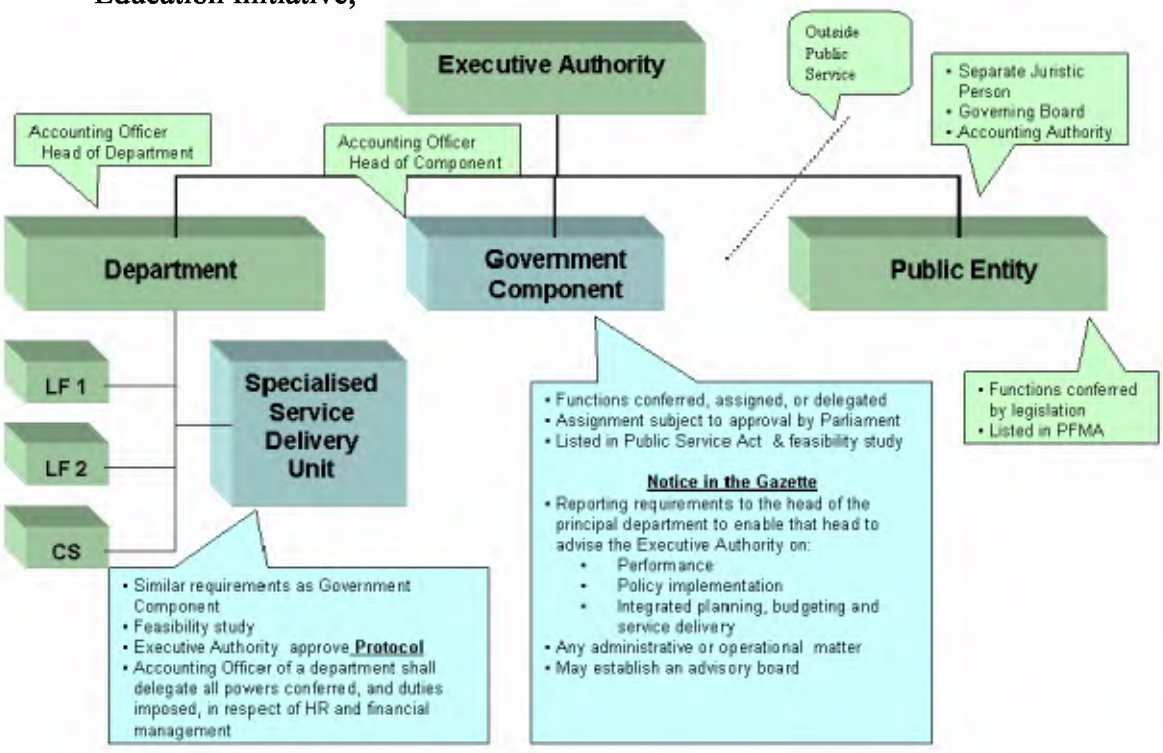
[12] Other than the PPP Mechanism no external borrowing is envisaged at this stage. Donor funding can be accommodated by establishing a Trading Account (similar to Project Development Facility of the PPP Unit).
[13] Schedule 3A and 3C listings in terms of the PFMA.
[14] Schedule 2, 3B and 3D listings in terms of the PFMA.

Trading Entity – An entity operating within the administration of a department for the provision or sale of goods and services (regulated by the PFMA, specifically Treasury Regulation 19). Accounting officer/head of trading entity has prescribed general responsibilities (section 38 of the PFMA), and prescribed reporting responsibilities (section 40 of the PFMA), including an annual report and financial statements. Any surplus or deficit of funds must, at the end of the financial year, be declared to National Treasury (par 19.7 of the Treasury Regulations), and could be retained subject to National Treasury approval. Allowed to open separate bank account, but may not borrow for bridging purposes and may not run overdrafts on bank account unless approved by the Department and National Treasury. Needs full business plan and National Treasury approval prior to establishment.

The Policy Framework for the Governance and Administration of Public Sector Institutions issued by the Department of Public Service an Administration and National Treasury in October 2005 also includes a list of prohibited corporate forms which include Section 21 Companies, Trusts, co-operatives, etc.

3.4 Recommended Approach

The diagram below depicts the key options applicable for the governance of the e-Education Initiative;



Given the scale, nature, and complexities of the e-Education Initiative, it is recommended that the national e-Education Unit be a dedicated unit within the national Department of Education, reporting directly to the Director-General of Education. This is to best achieve both the advantages of the internal and external options as discussed above. The key disadvantages that remain are that the Unit will not be able to source external funding

through external loans, and procurement flexibility is still hindered as compliance with the PFMA and procurement regulations are required. However, this approach will ensure high-level buy-in, quick decision-making, coordinated efforts, and support from all branches and directorates within the Department. The same structure should be implemented on a provincial basis, but using team that are slightly smaller and reporting to the Head of the Department.

The recommended model for the e-Education Unit is that the e-Education Initiative framework be driven by the national Department of Education in terms of policy and coordination and by the provincial Departments of Education with respect to implementation and local support (the latter driven through district offices). Close collaboration will be required between the newly established units and the existing units within the Institution.

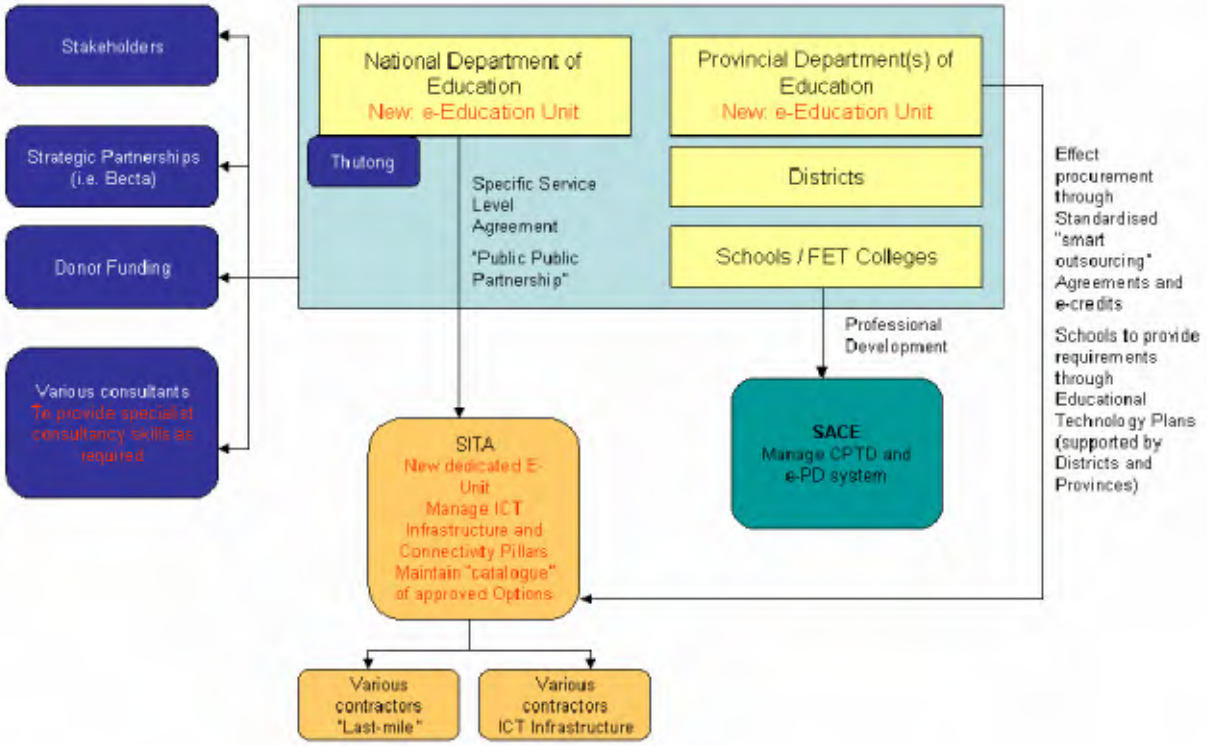
The main functions of the national e-Education Unit for the Initiative will be the same as discussed above, with an overall focus on all Pillars of the Initiative. The functions are: sector coordination; policy development; strategic planning; framework development (i.e. ICT Development Plans, procurement, norms and standards); financial planning; project management; evaluation and monitoring; technical support; asset management; and contract procurement (as applicable).

The above approach is similar to the established PPP Unit at National Treasury. In 2000, the Minister of Finance approved the establishment and staffing of the PPP Unit with donor assistance. By establishing such a dedicated unit, the Terms of Reference for this unit can be similar to that of a Public Entity, which allows for more flexibility in terms of occupational specific dispensation. A specific occupational dispensation will have to be agreed between the Institution and the DPSA.

The recommended governance structure will evolve over time to become the best fit. It will be important to review these recommendations in the light of lessons learned during the procurement phase, contract development, and negotiations and to update them as part of the Institution's contract management plan before implementation commences. This process of reviewing and refining the recommendations is critical, and forms part of the normal process under Regulation 16 of the PFMA.

The e-Education Unit will be focused on performing roles and responsibilities related to implementation of the e-Education Initiative, as stipulated in this document. This Unit will thus work in close collaboration with the existing branches and line functions of the Department in order to ensure systemic integration of the Initiative in the long-term. Formalized working agreements should be implemented between the e-Education Unit and the existing branches and directorates of the Department in order to clearly set out the different roles and responsibilities and the interactions between them, given that there are significant overlaps as indicated above.

In order to put the remaining sections of this document in context, the recommended high-level governance structure is presented below:



The key parties other than the Institution from a procurement perspective are:

1) SITA, where it is recommended that a dedicated e-Unit be established in SITA to manage ICT Infrastructure and Connectivity pillars on behalf of the Department; and
2) SACE, which will be responsible for managing the CPTD and e-PD systems.

Before providing details of the proposed governance structures of the e-Education Initiative as a whole, as well as staffing requirements for the e-Education Unit, it is important to analyse governance and management requirements for each pillar separately.

4 Governance Model for ICT Infrastructure and Connectivity

4.1 Management Agency

Given that ICT Infrastructure and Connectivity are not core function of the Department of Education, consideration is given below to the agency that should be responsible for managing these Pillars. This is referred to as the e-Unit, to distinguish it from the broader e-Education Unit that will take overall responsibility for the e-Education Initiative.

4.1.1 Functions to be Performed by the e-Unit

The main functions of the e-Unit for the Initiative will be similar to those of the e-Education Unit, but with specific focus on the WAN backbone and last-mile and ICT Infrastructure Pillars. These functions have been outlined above, so are only repeated below as they specifically relate to the e-Unit.

4.1.1.1 Sector Coordination

The stakeholder activity in relation to the e-Education Initiative has to be sequenced to achieve the required impact for this Initiative in relation to the WAN backbone connectivity, last-mile connectivity, and ICT infrastructure. These three areas of responsibility will be the main functions of the e-Unit

4.1.1.2 Strategic Planning

In terms of WAN backbone provision, long-term service delivery goals have to be determined with and for the Institution. Subsequently, conditions for delivery of services to meet these goals have to be agreed up front with SITA or another provider of the WAN-related services (for example, service quality provision and price). In relation to ICT infrastructure delivery, maintenance, and asset retirement, long-term goals also have to be agreed up front. Last-mile connectivity will require careful planning to ensure that SITA or the relevant service providers are reliable and cost effective.

4.1.1.3 Financial Planning

When contracting for goods and services, commercial terms have to inform the contracting regimes with SITA or any other providers of the WAN backbone, ICT infrastructure, and last-mile connectivity. Timing of contract implementation dates for goods and services have to coincide with cash flow available for those goods and services to avoid penalties and loss due either to poor ordering or delayed installation dates. Contracting and procurement for goods and services must be budgeted for and planned in such a way as to optimize the budget available.

4.1.1.4 Project Management

In relation to the WAN backbone, the SITA must manage availability of WAN backbone services to all subscribers to the WAN backbone. Connection of schools to the WAN

backbone must be the subject of a well planned, sequenced, and managed project. The preferred supplier of choice to the implementing body is the SITA given its statutory mandate. However, the e-Unit must ensure that it has the necessary capacity to manage SITA in fulfilling its duties. The WAN backbone is highly complex and will require deep technical and management skills, amongst others, both within the e-Unit and the SITA, to be successfully implemented.

Rollout of ICT infrastructure to the sector has to be informed by a sound project management plan that will vertically integrate appropriate procurement, rollout, maintenance, upgrades, and retirement of ICT assets across all provinces. There is a high degree of risk that quality, service offerings, maintenance, and other after-sales services of ICT infrastructure may vary in quality if there is not strict adherence to the supplier specifications for ICT infrastructure. This would require that the correct equipment be delivered at the correct site for the correct price with the correct SLA. This is a difficult and complex activity given the scale of rollout. Consequently, any governance model must be capable of managing this aspect precisely and on time, for example, by ensuring that WAN connectivity coincides correctly with installation of ICT Infrastructure in a school.

Provision of last-mile connectivity similarly may be performed by various service providers in the regions, and this provision must harmonize with delivery, and the requirements, of WAN backbone services. Similarly, last-mile connectivity is key to ensure universal accessibility of schools to essential network services. Procurement, rollout, maintenance, and other services of the relevant service providers of this essential leg of connectivity need to be managed appropriately by the e-Unit across all provinces.

This function in the governance model will underpin the success of all others.

4.1.1.5 Technical Support

The e-Unit will have to acquire dedicated technical skills to assist provinces and schools with the WAN backbone, last mile connectivity, and rollout of ICT infrastructure. These skills will span from the technical level of skill that can contribute to resolution of technical challenges to skills relating to management of deployment and exploitation of technology.

The WAN backbone will require a full-time team to monitor network services and attend to connectivity problems for users. The governance model needs to cater for creation of this competency in the e-Unit. Similarly, schools require adequate technical support for last-mile connectivity and rollout of ICT Infrastructure, so this competency must also be created in the e-Unit. This may take the form of remote helps desks, service personnel on site, or call in assistance when required. Technical support must be managed and have a clear role in the work of the e-Unit. It can be expected that some technical competencies will be performed within the e-Unit by its own staff, whilst others are performed through use of third party suppliers. For example, technology management skills might be retained internally whilst a help desk service could be provided through a third party.

4.1.1.6 Evaluation and Monitoring

This function should be established within the e-Unit in order to assess quality of deployment and delivery of benefits, as well as to determine any need for corrective actions or modified strategies and tactics.

4.1.1.7 Asset Management

Asset management covers the manner in which goods procured under this Initiative will be kept secure, maintained in a sufficiently current state, and then finally disposed of once they become redundant. Asset management will ensure compliance with the relevant public sector prescripts for management, security, and disposal of assets. This task is formidable given the various categories and geographical distribution of the assets. The e-Unit must have a credible system to track asset condition, whereabouts, replacement, and retirement, as well as to deal effectively with risks of damage, theft, and loss.

Anecdotal evidence suggests that schools are presently experiencing high rates of theft of ICT infrastructure and equipment. An asset management tracking system must be run by the implementing body to ensure that physical infrastructure which enables the LAN, WAN backbone and last-mile connectivity remains in place. The same applies to ICT equipment made available to learners, educators, administrators, and managers. Service providers to the e-Unit of the various components may be requested to propose an asset management plan. This asset management plan must be capable of being run nationally, but with very strong provincial and district elements in terms of responsibility for assets.

Asset management will be required to move beyond the physical domain of equipment to address intellectual property asset management. The Initiative will use software on a very significant scale, so it will be essential to manage use of these intellectual property assets in a manner is both cost-effective and meets licensing provisions of the intellectual property owners. The Institution risks reputational and financial damage if this type of asset is not controlled effectively.

4.1.1.8 Contract Management

This function involves participating in procurement and management of contracts with various service providers of the WAN backbone, last-mile connectivity, and ICT infrastructure. Contract management ensures compliance of the service providers with agreed service level specifications and records all legal variations to the contract.

In the e-Education Initiative numerous agreements are envisaged for the WAN backbone, last-mile connectivity, and ICT infrastructure. Compliance and fulfilment of relevant contract conditions in each case will be the responsibility of this function. Procurement requirements mean that there will be contract management complexity. School benefits will only be realized if delivery of multiple suppliers is controlled, integrated, and coordinated, which will present management challenges.

In relation to the WAN backbone, the business agreement with SITA under the SITA Act or any other provider must be managed actively, with optimization of performance as the objective. In the case of last-mile connectivity, where there may be multiple suppliers, active contract management will be vital to ensure continuity and reliability of the service by local suppliers. The contract management regime must be able to reach nationally, but with sufficient provincial and district focus and control to be effective.

4.1.2 Agency Options for the e-Unit

Before models for an e-Unit are considered, they should be placed in the context of existing governance structures of information technology in government:[15]

- The Minister of Public Service and Administration oversees deployment of information technology within the entire public service.
- The DPSA has led the process of creation of a post of Government Information Technology Officer (GITO) in all departments. A GITO's function is to manage the IT function of the Department and to ensure establishment of sound information technology services. It is also expected that a GITO will manage the relationship with SITA (for example, control of the Business Agreement and SLAs with SITA and/or other suppliers of information technology goods and services).
- The DPSA has also led the process for establishment of a Government Information Technology Officer's Council (GITOC) to serve as an IT coordination and consolidation vehicle in Government and as a radar that will assist in informing the government on a continuous basis when and how to intervene. The GITO of a national Department represents that Department on the GITOC. Provincial GITOCs have also been established, and the chairperson of each provincial GITOC represents that province at the national GITOC.
- During 1999, SITA was established to consolidate and coordinate the State's information technology resources in order to achieve cost savings through scale, increase delivery capabilities, and enhance interoperability. SITA is managed as a private company, although it is a Schedule III Public Entity in terms of the PFMA. The DPSA states that centralized IT procurement for government departments is essential to ensure:
  - Application of interoperability and security standards and certification of all IT acquisitions for compliance with such standards;
  - Leverage of economies of scale; and
  - Elimination of duplication.

Given the above functions that would need to be performed by the e-Unit, various models can be considered for an e-Unit. In reviewing models, emphasis was placed on choosing one that would best expedite the aims of the e-Education Initiative. The e-Unit may be: in house to the national Department of Education; an establishment of SITA; a special purpose vehicle (SPV); the establishment of a public entity; or outsourced.

4.1.2.1 In-House

The in-house function entails establishment of a dedicated unit within the national Department of Education to manage and procure (as applicable) connectivity and ICT Infrastructure Pillars on behalf of the Institution.

The national Department of Education's structure presently includes a GITO directorate that resides under the Chief Financial Officer's branch. Taking into account the scale and complexity of the e-Education Initiative, there is currently very limited capacity and specialized expertise within this directorate that could be used. Hence, significant investment would have to be made by the national Department to establish a dedicated unit to manage

[15] Source: Mr A Raubenheimer, national Department of Education

and carry out the functions above in respect of the connectivity and ICT infrastructure Pillars. These are also not core functions of the national Department of Education.

Regulations in the SITA Act note that, if SITA does not comply with provisions of the regulations regarding procurement, the relevant authorities may request the Minister for Public Service and Administration to approve that such goods or services be procured directly by the Department. This can be possible on condition that SITA conducts standard certification in respect of such goods or services and that the Department submits a report to the relevant Treasury, the DPSA, and SITA stating why SITA is not used for procurement and particulars of the procurement process followed.

ICT goods and services acquired by means of a PPP must take place in accordance with regulations made under the PFMA and the SITA Act, subject to the conditions referred to above. SITA must, however, be represented in the relevant PPP project task team to ensure standard certification in respect of all ICT goods and services acquired.

Whilst the first option is possible, it appears least probable. However the e-Unit, whatever its final form, will be required to report on achievement of its goals in terms of the PFMA, 1999, to the Director-General of the national Department of Education, as well as the GITO Directorate of the Department.

4.1.2.2 An Establishment of SITA (e-SITA)

Section 7 of the SITA Act determines that there are certain areas where SITA must, on behalf of a Department, render services and areas where SITA may, on behalf of a Department or a public body which so requests, render services. The 'must' and 'may' services have been set out in more detail in the legal due diligence report (contained in the Procurement Options Report), but these, in essence, determine that every department must procure ICT goods and services through the SITA.

SITA is currently structured according to Client Business Units (CBUs), consisting of the following[16]:

- South African Police Services (SAPS);
- Department of Defence (DOD);
- National Departments (of which the Institution is part);
- Coastal regions;
- Central regions; and
- Northern regions.

These are not separate legal entities, but business units forming part of the business operations division of the SITA. The reason for SAPS and DOD having dedicated CBUs is that, apart from being founder members of SITA, they have effectively completely outsourced their ICT to SITA. The scope, depth, and value of their service portfolios warranted dedicated focus and structures within SITA.

[16] Source: Discussions and information provided by Mr Cisco van Schaik, General Manager: DOD Business Unit, SITA

The CBUs also serve as nodal point for all SITA services delivered to the entity in question. The functions performed by the DOD client business unit (either directly or sub-contracted within SITA and/or to industry) in the case of the Department of Defence, cover the total application and infrastructure domains in terms of:

- Planning (architecture, ICT related business analysis, and so on);
- Acquisition projects (procurement, implementation, and programme and project management);
- Production system management (infrastructure/application support, maintenance, optimization, information system solutions, information management, and so on); and
- User system management (functional application support, desktop/LAN support, information system solutions, training, information management, and so on).

The relationship/governance between the Department of Defence and the SITA DOD business unit is very formalized and controlled by means of:

- A business agreement;
- Business model;
- Life cycle / value chain-centric service level agreements with effective metrics; and
- A SITA/DOD board.

The purpose of the Board is to facilitate full responsibility as placed in the GITO and the General Manager (Defence Business) of SITA for ensuring alignment and continuous improvement of information (as an asset) and the DOD systems and service requirements of the DOD with its policies, strategies, and plans that govern and direct such activities. This is with a view to improving the scope, quality, effectiveness, efficiency, and economy of use of ICT. The Board is non-statutory and is not a juristic person.

Issues to consider in this regard and to be addressed in the Public-Public Partnership agreement, business agreement and business model are:

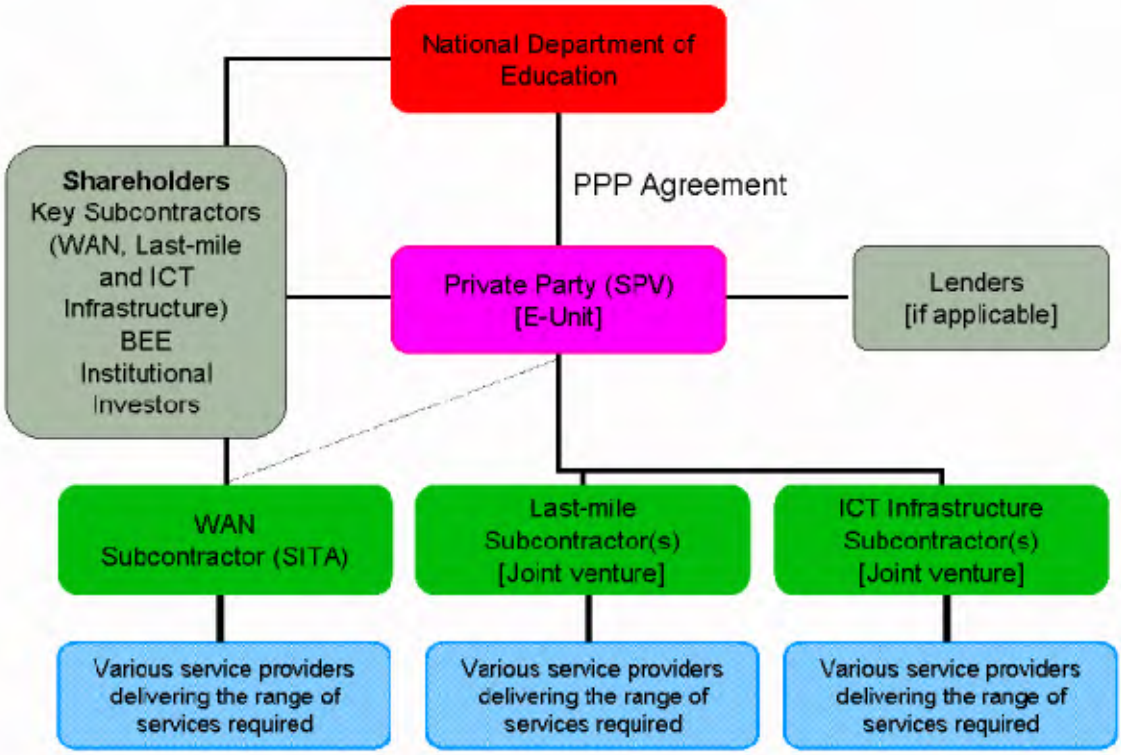
- Human resource capacity – taking into account the scale and complexity of the e-Education Initiative, there is currently very limited capacity within SITA that may be used. Hence, significant investment will have to be made by SITA to establish a dedicated unit to manage and carry out the required functions in respect of the connectivity and ICT infrastructure Pillars for the e-Education Initiative.
- Monopoly provision – service provided by SITA can be seen as having monopolistic characteristics. Providing a long-term balance between service provision by the SITA and provision by the private sector will be important.
- Conflict of interest – there is a concern about the role of the SITA in terms of being a technology advisor to government whilst simultaneously being a service provider. It is very difficult to structure tight performance contracts when the same party is giving advice on the nature of the contract and providing the service. Equally, a client will often get a poorer deal if it selects a single supplier and then negotiates a contract (versus defining a contract that covers its requirements and offering these terms to multiple suppliers). For these reasons, other than the WAN backbone connectivity, the recommendation is that the role of SITA should focus on providing expert advice, with service provision delivered by the private sector.
- Capacity to deliver – anecdotal evidence suggests that IT projects where SITA has been or is currently involved as procurement agent have suffered delays (for example, the Department of Justice's Integrated Justice Project that has, as one of its goals, to create an

electronic passage of a prisoner between the South African Police Services, Correctional Services, and the Department of Justice).

- International experience with large IT projects – experience in the UK and other countries indicates that many large IT projects fail because of over-emphasis on IT systems at the expense of getting back-end business processes right. Locally, the benefits of this business-focused approach have been experienced with the South African Revenue Service (SARS) where, only after the business process was re-engineered, were investments made in IT systems. SITA's core skills are technological, and it does not presently have experience in the business of education. Consequently, it may not be able to easily offer a business-orientated solution capacity.
- Budget issues – it will be important to indicate clearly the extent to which SITA services are funded through the DPSA budget and to what extent will a recovery be made from the Institution.
- Value for money – SITA works on a cost-recovery basis as this is supposed to lead to better service provision. However, the speed at which its rates have increased in the past is concerning in terms of both affordability and value for money. Clear guidelines will have to be developed in terms of a tariff policy. Anecdotal examples of higher-than-market-costs are frequently cited.

4.1.2.3 Special Purpose Vehicle (SPV) as a Public Private Partnership

The diagram below reflects a third option: a Special Purpose Vehicle that places the various role players in a PPP.



The national Department of Education would enter into a PPP Agreement with an SPV, which is the Private Party and is a company established solely for the purpose of executing the Connectivity and ICT infrastructure pillars of the e-Education Initiative. The SPV would

be a company or group of companies that provide brand-independent ICT consulting services. The SPV services would include, amongst others:

- Independent expert technical advice on selection and evaluation of ICT infrastructure, WAN backbone, and last-mile options;
- ICT support services;
- Management of various suppliers and subcontractors providing services to the Department (which may be managed by the SPV on behalf of the Department or may contract directly to the SPV so that it can ensure delivery of services and goods);
- Access to funding;
- Flexible and transparent contracting; and
- Decentralized support to schools and district offices.

There will be shareholders' agreements between shareholders who expect to derive reasonable returns from their investments. The shareholders' investment would be in the form of shares in the Private Party and shareholder loans to the SPV. Commonly, at least 40% of shareholders' investment would be held by Black enterprises or Black people. The key subcontractors (joint ventures) would also be shareholders of the SPV with some institutional investors (which could be donors), if applicable.

Where the national Department of Education enters into a Public-Public Partnership with the SITA for provision of WAN backbone connectivity, the SPV (through its provision of e-Unit services) could manage this agreement on behalf of the Department. It may also contract with suppliers to provide some services related to the WAN backbone, this depending on the scope of the Public-Public Partnership agreement.

The SPV would enter into sub-contracts with ICT infrastructure and last-mile suppliers where it is determined that such sub-contracts are not more beneficial if taken out in the Department's name. This would be done on the basis set out in the procurement strategy for these Pillars.

Based on the description above, the SPV would take over procurement, implementation, management and operational functions from the Institution. The national Department of Education's responsibility would then be to set policy, norms, and standards and to manage the PPP Agreement with the SPV. The SPV and its subcontractors would be responsible to the Department for delivery of the Output Specifications relating to the connectivity and ICT infrastructure pillars.

The SPV may procure funding on-balance sheet or from senior lenders, providing the cash flow of the Project as security. Senior lenders would typically have step-in rights and/or substitution rights in the event of non-performance by the Private Party. A financier direct agreement between the senior lender and Institution would facilitate the step-in rights and/or substitution rights. The financier direct agreement is intended to facilitate a climate conducive to lender interest, by providing latitude for the senior lender, in the case of default or potential default by the Private Party, to exercise a range of contractual rights and remedies aimed at restoring the service, or replacing the current service provider with one acceptable to Institution, thereby securing the future flow of revenue and the future service of the debt in question. Parent company and/or performance guarantees are anticipated to be provided in favour of the Private Party by the major shareholders and ceded to lenders. They serve to

provide security for the obligations of the Private Party, likely to be a newly established company without a track record other than the skills possessed by consortium members.

Having considered the nature of ICT infrastructure and connectivity procurement implied by the phases of the e-Education Initiative, the recommendation is that a PPP does not present an attractive procurement methodology or governance structure. The main arguments supporting this conclusion are:

- In the part of the e-Education Initiative (the 'pull' phase) that has most significance[17] from a procurement perspective, there will be no fixed options or service requirements. This is not true for the 'push' phase and a PPP could be considered for this activity if the 'pull' services and products were not to be delivered into the same environment. Using a PPP for the 'push' phase and alternative procurement for the 'pull' phase would result in school environments with multiple suppliers. This would complicate matters for schools and risk overlaps and gaps in service delivery and accountabilities.
- ICT infrastructure technology will evolve rapidly. A PPP requires some degree of certainty as to output specification, which cannot be provided in this instance. The second factor relating to technology evolution is cost. Moore's law,[18] which predicts both improved technology and declining costs, has been consistently demonstrated over the last two decades. This creates high financial risks for any supplier and the Institution. Unpredictability of future pricing and performance leads to a risk of poor value of money for the Institution on the one hand and failed suppliers through lack of profitability on the other.
- There is uncertainty regarding pace of implementation, as this is dependent on achieving the basic readiness criteria before implementing the 'push' phase, as well as achieving e-readiness of schools before implementing the 'pull' phase.
- This may create a monopoly in the market. For example, from a last-mile perspective, it basically requires that all key suppliers in the market form a contractual relationship. This may have a negative impact on competitive pricing.
- Because the SPV needs to have some independence from brands and suppliers, it may be difficult to find sufficient companies that can fulfil the role.

Inability to be definitive about these matters leads to a conclusion that, although these requirements would be met through partnerships between various service providers (public and private sector) and management of agreements should include some of the rigorous contracting principles of PPPs, the procurement mechanism would not be a PPP as defined in Treasury Regulation 16.

This option is thus not recommended for the e-Unit.

4.1.2.4 New Public Entity

Public entities are established in the public sector, but outside the public service, typically for reasons of strategic, social, or economic intervention by the State or to deal with strategic risks and dangers that the State or society face to security, health, prosperity, or wellbeing, and/or adopting commercial and business principles in service delivery when it is required,

[17] Volumes of ICT infrastructure in the 'push' phase will be low relative to the 'pull' phase. It would not be prudent, however, to use different procurement mechanisms for the two phases.

[18] Colloquially, 'bang per buck' doubles every 24 months', refer http://en.wikipedia.org/wiki/Moore's_law

and/or signalling that there is need for objectivity and more operational autonomy, yet retaining accountability in delivery of services.

Whilst this option is possible for the e-Unit it appears unjustifiable given that SITA, a public entity, already exists to perform almost identical ICT functions albeit not specifically in the education sphere.

4.1.2.5 Outsourcing

Successful outsourcing engagements are grounded in clarity of the goals that outsourcing is to achieve. The nature of a vendor relationship – including contract type, performance measure, and risk-and-reward incentives – must be aligned with an outsourcing initiative's underlying strategic intent. While functions with clear performance expectations and observable results are well served by a contractual agreement, uncertain or risky initiatives are better served through a flexible partnership.

The following functions of the e-Unit can potentially be outsourced:
- Project management;
- Evaluation and monitoring;
- Technical support;
- Asset management; and
- Contract management.

The above should be undertaken in conjunction with the SITA option, as discussed above.

4.1.3 Recommendation in Respect of the e-Unit

Given the above analysis, it is recommended that the e-Unit be established as a dedicated client business unit within the SITA, similar to the DOD and SAPS units. This will enable the Department of Education and SITA to consolidate and coordinate education information technology resources (including the e-Education Initiative), achieve cost savings through scale, increase delivery capabilities for the education sector, and enhance interoperability between the education sector and the rest of Government.

Significant investment will have to be made by SITA to establish dedicated capacity for the e-Unit to manage and carry out the necessary functions in respect of the connectivity and ICT Infrastructure Pillars for the e-Education Initiative.

Furthermore, other than the statutory WAN backbone connectivity, it is recommended that the SITA should focus on providing good expert advice and overseeing service provision by the private sector.

SITA should provide inputs where IT procurement is concerned. However, the Accounting Officer of the national Department of Education should retain discretion in choice of the procurement framework and thus responsibility and accountability for procurement.

Therefore, within the Department of Education's e-Education Unit, dedicated personnel will remain responsible for:
- Policy development;

- Sector coordination;
- Strategic planning;
- Financial planning; and
- Contract management of SITA e-Unit.

These units (the e-Unit and the e-Education Unit) should work in close liaison with the GITO directorate of the national Department of Education.

4.1.4 Capacity Requirements within the e-Unit

Based on discussions with SITA, the e-Unit will need to be managed by a General Manager, with approximately five Senior Managers in support, as well as approximately 200 people who will be deployed at National and Provincial level, consisting of both permanent staff and contractors, to provide procurement, implementation, support, and governance services required by this Initiative. The cost of the e-Unit to the Department of Education is estimated to be approximately R100 million per annum, which equates to approximately R4,000.00 per school per year.

Due to the magnitude and dynamics of this Initiative, as well as the various service providers and role players involved, it is important that roles and responsibilities are clearly defined and integrated to ensure success of the Initiative. Roles and responsibilities, as well as service levels and measurement metrics, therefore need to be defined and agreed in a business and SLA. It is important that the SITA e-Unit and the e-Education e-Unit work closely in management and day-to-day implementation of the Initiative.

The services required from the SITA e-Unit have been divided into primary and secondary services.

4.1.4.1 Primary Services Required

The following primary services will be required from the e-Unit in terms of ICT infrastructure and connectivity, for both Managers and Administrators (i.e. the push strategy) as well as for Educators and Learners (i.e. the pull strategy), to support the e-Education Unit in the day-to-day implementation of the Initiative:

- Architecture – the enterprise-wide view of all ICT requirements and how they integrate, as well as the policies and standards that will guide the construction of the architecture.
- Design – the detailed design of ICT infrastructure solutions.
- Build and deploy:
  a) Build – acquisition of the specified requirements. Requirements will include local area networking, desktop end-user devices for administrators, laptops for principals and printers; and
  b) Deployment – installation and implementation of the specified requirements in the target environments.
- Operate – daily availability of ICT infrastructure by ensuring routine ICT infrastructure management tasks are performed.
- User Support – services that provide advice and guidance and other relevant services to the users of the ICT infrastructure.
- Maintain – services required to keep the deployed ICT infrastructure and connectivity operating in accordance with specifications.

- Enhancements – addressing emerging requirements that result in an amendment of then-current specifications.
- Refresh – replacement of existing ICT infrastructure when it reaches the end of its economic life.
- Quality management – activities that aim to maintain and improve quality.
- Transfer – transfer of ownership of ICT infrastructure to the Institution.

4.1.4.2 Secondary Services Required

The following secondary services will be required from the e-Unit to support the e-Education Unit in the governance of the Initiative:

- Assist with development of policies, procedures, norms, and standards covering implementation and use of ICT infrastructure and connectivity;
- Develop, issue, and adjudicate tenders for ICT infrastructure and connectivity services required;
- Monitor delivery of ICT infrastructure and connectivity services by various service providers;
- Perform contract and SLA management;
- Support Schools and FET Colleges in development of their ICT Development Plans;
- Assist with promotion of use of Open Standards and FOSS, as well as research and development of FOSS applications; and
- Monitor and assist with the technical support provided through the Call Centre.

4.2 Technical Support

4.2.1 Introduction

During the Needs and Options Analyses, information was obtained with regards to technical and other support capacity within the Department of Education. ICT provincial coordinators have been appointed in all nine provinces at levels ranging from Director to Deputy Chief Education Specialist and First Education Specialist. Provinces are at various levels of progress in the process of appointing ICT coordinators, technical support, pedagogical support, and a teacher in each school as an ICT champion. Due mainly to budgetary constraints, provinces are at various levels of progress in appointing the required personnel. Across all provinces, the following has been achieved for 2006/07 against the targets set:

- 30% of the District level ICT coordinators have been appointed.
- 20% of the ICT technical support personnel (only in five provinces) have been appointed.
- Pedagogical support personnel have only been appointed in Western Cape and the North West. No appointments have been made in the Eastern Cape, Free State, Gauteng, Kwa-Zulu Natal, Limpopo, and Northern Cape.
- 52% of the ICT champions per school (only in five provinces) have been appointed.

Thus, there has been advancement in provincial ICT capacity, but there is still a capacity gap to ensure proper ICT integration. It appears that only the Western Cape and the FET Colleges, to some extent, have the existing capacity to manage and implement this e-Education Initiative. The requirement for appropriate capacity is one of the core requirements that need to be in place for a successful e-Education Initiative.

Due to the concurrent roles and responsibilities between the national and provincial Departments of Education, as well as legislative and policy requirements, implementation and procurement models selected for the e-Education Initiative will have a significant impact on capacity required from a national and provincial perspective, as well as at school and district level.

Effective support requires a combination of methodologies, technologies, and skills. No one-size-fits-all model has become standard. Each case requires a support needs analysis and design of a support infrastructure. Global experience of ICT shows that insufficient or inappropriate support infrastructures results in user frustration, poor exploitation of ICT resources, and other undesirable characteristics

Deployment and operation of hardware, software, and network infrastructure under the e-Education Initiative should include proper attention to ICT governance. This will ensure that investments in ICT infrastructure are deployed, managed, operated, and maintained in a prudent manner that accords with good practice. Such ICT governance will include, inter alia, publication of policy, procedures, standards and norms, assurances that suitable governance structures are in place, and development of Institutional capacity to perform IT governance-related functions.

4.2.2 Technical Support Requirements and Options

Research on technical support models used in other countries has highlighted the different roles that various stakeholders need to fulfil to ensure effective maintenance and support, for example:

Initiative	Model Used
Tech/Na![19] (Namibia)	The National Education Technology Service and Support Centre (NETSS) has been established to provide infrastructure support and maintenance service for ICT infrastructure in schools. It is planned to have ICT available at all schools by 2009. The NETSS centre will train technicians to ensure that first line support is available in-house at every school. Second and third line support will be provided through a centralized helpdesk at the NETSS centre. A TCO model has been planned for ownership of the infrastructure.
BECTA[20] (United Kingdom)	BECTA employs a full support staff for technical helpdesk support of school networks. In-house support at schools addresses first line support. BECTA's Framework for ICT Technical Support (FITS) helps schools to achieve high quality technical support and service provision. FITS is the recognized standard for managing ICT in schools, and enables internal and external technical support providers to implement best practice with minimum effort. Schools implement FITS to make the most of their investment in ICT. BECTA has developed separate toolkits to guide primary and secondary schools through implementation.
NEPAD	Management of technology requires specific resources to undertake activities such as providing maintenance and support, managing software and anti-virus updates, controlling security on the school equipment, testing software and managing the refreshment and disposal of equipment where necessary. Proper technology planning

[19] http://www.tech.na/index.htm
[20] http://www.becta.org.uk/

	must plan for these activities and ensure that resources are available to maintain full functionality of the equipment.

The following are extracts from the considerations and recommendations in the report by the Minister of Education after her visit to the fourth annual Moving Young Minds seminar in London during January 2007, which are relevant to maintenance and support of ICT in schools:[21]

> It was clear that ICT integration in teaching and learning is effective in UK schools where adequate infrastructure and technical support is provided. UK schools often share IT specialists with one another to maintain and support ICT infrastructures in regions. Schools have allocated budgets to pay for these services. They make extensive use of local industry to support the schools.
>
> Many schools also appoint an ICT champion as a member of staff. The responsibilities of the ICT champion are to oversee, guide and train teachers to use equipment (IWBs, learning platforms, voting systems and software) within their subject areas and for assessment purposes. The focus is not on technology, but on a sound underpinning pedagogy. The ICT capacity of teachers is developed within the subject areas. This implies that subject specialists are also ICT and digital content specialists and offer development to teachers in both areas
>
> The issue of ICT technical support as well as pedagogical support to South African schools needs to be emphasized, particularly to the Provincial ICT representatives. Consideration could be given to training unemployed members in communities as IT and network technicians through various skills development programmes. Experienced teachers could also provide assistance in this regard. In this regard the Department of Education needs to investigate the possible role FET Colleges can play in this regard.

Due to the various role-players involved that are responsible for technical support and maintenance tasks (such as reporting, follow-up, resolution, and analysis), it is important that roles and responsibilities are clearly defined. It is therefore important to follow good practice processes. The IT Infrastructure Library (ITIL) is an internationally recognized good practice framework derived from the collective experiences of ICT technical support providers. It is the foundation for the Becta framework for ICT Technical Support (FITS).[22]

The good practice processes defined by ITIL, which are required to effectively manage ICT resources, consist of the following:

Area	Process
Service Desk	The service desk acts as a single point of contact between ICT and users, where they can submit enquiries, log incidents, obtain help, and request changes. The service desk not only handles incidents, problems, and questions, but also provides an interface to users. Dealing with requests for equipment moves, software installations, and help on how to use a system are typical service desk functions. The single point of contact at the service desk can perform some aspects of financial management and configuration management while also helping with the production of reports and administrative functions in other areas.

[21] Report: Moving young Minds and BETT Show 8 – 15 January 2007

[22] A complementary publication to the Framework for ICT Technical Support (FITS),developed by Becta and freely available on the Becta website http://www.becta.org.uk/leaders/technicalsupport

Area	Process
Incident Management	Incident management is a defined process for logging, recording, and resolving incidents. The goal is to restore service as quickly as possible. This is often through a workaround or temporary fix, rather than trying to find a permanent solution. Detecting the underlying cause and permanent solution is the responsibility of problem management. Incident management should ensure that all details are recorded, so, if a permanent solution is needed, problem management is able to continue once a workaround has been implemented
Problem Management	The goal of problem management is to minimize both the number and severity of ICT incidents and problems in the school. Finding permanent solutions to underlying infrastructure problems will reduce the impact of incidents and problems prevent their recurrence and help with future resolutions. A problem can be the occurrence of the same incident many times, an incident that has an impact on many users, or the result of network diagnostics revealing systems not operating in the expected way.
Change Management	Change management is the process for managing implementation of changes to the ICT infrastructure, including hardware, software, services or related documentation. Its purpose is to minimize the disruption to ICT services caused by change and to ensure that records of hardware, software, services and documentation are kept up to date. A change may be the result of a technical failure or problem dealt with in problem management. Alternatively, it could be because of a new ICT software or hardware requirement. In this instance the release management process would be the mechanism for defining and developing the new service and ensuring its readiness for implementation.
Release Management	Release management is the process of planning, building, testing and deploying hardware and software, and version control and storage of software in a DSL (definitive software library). The DSL is a repository for storing released software and serves as the central point for obtaining software versions for installation. The goal of release management is to ensure that a consistent method of deployment is followed. It reduces the likelihood of incidents resulting from rollouts and ensures that only tested and accepted versions of hardware and software are installed.
Configuration Management	Configuration management is the process of creating and maintaining an up-to-date record of all the components of the ICT infrastructure. The purpose is to show what makes up the ICT infrastructure and illustrate the physical locations and links between each item, known as configuration items. Configuration management is more than just the recording of computer hardware for the purpose of asset management. The extra value is the rich source of support information it provides consistently to all interested parties. This information is stored together in the configuration management database (CMDB).
Availability and Capacity Management	Availability and capacity management in ITIL are two separate processes: availability management and capacity management. Both processes focus on the proactive detection and prevention of ICT problems. They help you to optimize what you have and to decide what you need. We have streamlined these themes into two processes that span both availability and capacity management. They are network monitoring and preventative maintenance, terms that should sound more familiar to you.
Service Level Management	Service level management is the process of ensuring that ICT services are supported to an acceptable level. It involves understanding the ICT requirements of the end-users and working within the constraints of available resources. The result is an agreed, consistent level of service that end-users can come to expect. This agreement is between those responsible for ICT and the end-users, who are usually represented by one or more people from each area or department. Once agreement is reached, the service level management process facilitates the creation of underpinning agreements with third parties involved in the service provision.

Area	Process
Service Continuity Management	Service continuity management is a reactive and proactive process. It involves contingency planning for recovery in case an unforeseen disaster or event should seriously affect or destroy the ICT service. It also involves risk analysis and the implementation of countermeasures to minimize the likelihood of such an event happening in the first place. As the title of the process suggests, service continuity management is about maintaining continuity of service – not just the continuation of equipment.
Financial Management	Financial management is the tracking and control of ICT services and support costs. In its entirety, it also covers cost recovery as a means to place accountability for ICT costs on the users of the service. The purpose is to ensure that the costs are justifiable. This process also helps to identify particularly costly areas that you may want to examine to see if a different approach might reduce costs.

Support is usually provided at three levels:
- First line support (a local person or Help Desk with basic ICT skills);
- Second line support (a Service Desk function with skilled resources);
- Third line support (suppliers, system and network administrators, and so on).

Resolution ability indicates how many incidents can be attended to immediately by the first line. Resolution ability is a measure of quality of service experienced by the user in contacts with the Service Desk. There are three categories in the resolution ability of the Service Desk, namely 'highly-skilled', 'medium-skilled', and 'low-skilled'.

The following is an analysis of the characteristics, as well as advantages and disadvantages of the different levels of resolution:

Highly-skilled Helpdesk	
A highly-skilled Helpdesk resolves 60 to 90% of all incidents in the first line. This demands considerable qualities from the Helpdesk staff. People who staff the first line need to have a broad general knowledge of all task fields of the IS/IT department (such as data communication, PC hardware and software, and office automation) and extremely good knowledge of one or more clusters of the specialization, so that they are actually capable of resolving 60 to 90% of the incidents in that field. Staffing of the Helpdesk and the distribution of employee knowledge profiles during Helpdesk opening times must cover all the task fields of the IS/IT department. As the first line resolves the majority of incidents, workload for the second and possibly third line is low. Employees included in this line are specialists in one or more task fields of the IT organization. In view of the number of incidents that occur, these people could be deployed on a part-time basis for this work.	Advantages (for example): • User confidence in the quality of incident handling (many solutions because the first line has sufficient knowledge); • A low number of referrals means less inconvenience for users; • Fewer interruptions in the work of the systems managers (second line); • Sufficient back-up for the staffing of the first line; • Learning effected through knowledge exchanges. Disadvantages (for example): • Proper agreements have to be made about registering incidents uniformly (and they must also be strictly fulfilled); • May not be possible to find enough skilled people to fill the post of systems manager / Helpdesk employee.

Medium-skilled Helpdesk	
A medium-skilled Helpdesk resolves 20 to 60% of all incidents in the first line. People who staff the first line must have a general knowledge of all task fields of the IT organization. This enables them to resolve 20 to 60% of incidents. Staffing of the Helpdesk and distribution of employee knowledge profiles during Helpdesk opening times will cover a large part of the task fields of the IT organization. As the first line is unable to resolve a large number of the incidents, workload for the second line is high. The employees in this line must have a general knowledge of all the task fields in the IT organization (such as data communication, PC hardware and software, office automation), and extremely good knowledge of one or more clusters of the specialization. Employees in the second line must be capable of resolving 60 to 90% of all incidents.	Advantages (for example): • Few changes are required in the staffing of the first line (in terms of numbers); • Little needs to change in the current level of knowledge available in the first line; • Permanent Helpdesk staff. Disadvantages (for example): • Many interruptions in the work of systems managers (second line); • User confidence in the quality of incident handling is still unclear (too few solutions owing to a lack of knowledge in the first line); • Referrals are inconvenient for users.

Low-skilled Helpdesk	
A low-skilled Helpdesk resolves 0 to 20% of all reported incidents in the first line. In practice, this amounts to the role of a telephonist or what is known as a 'call dispatcher'. A first line of this kind must guarantee optimum access to the Helpdesk. Such a Helpdesk also forms the only point of contact for the entire IT organization. Activities include taking calls from users and attending to incidents that are easy to resolve. Other incidents are referred to employees in the second line. As the first line is unable to resolve the majority of incidents, workload for the second line is extremely high. Employees in this line must have a general knowledge of all task fields of the IT organization (such as data communication, PC hardware and software, office automation) and an extremely good knowledge of one or more clusters of the specialization. Employees in the second and possibly third lines must be capable of resolving 60 to 90% of all incidents.	Advantages (for example): • Good routing of telephone calls. Disadvantages (for example): • It costs a full-time equivalent job; • No immediate contribution to quality of delivery of IT services; • Unpleasant for the user (calls are attended to bureaucratically by several people).

4.2.3 Recommended Technical Support Model

Considering the Provincial Departments' progress in appointing ICT coordinators (technical support and pedagogical support) and identifying teachers in schools as ICT champions, it is clear that the Department recognizes the different roles in delivering the support required.

There are two key questions that need to be answered with regards to any support. The first is how and where incidents or problems will be reported and the second is who is able to address the incident or problem.

4.2.3.1 Service Desk / Help Desk / Call Centre

Key to success of this Initiative is to use a central system to log incidents and problems, as well as the actions taken to resolve them. The main reason for the central system is to be able to perform problem management on the causes of incidents, as well as for reporting and monitoring of services providers.

It is, therefore, recommended that a National Call Centre be established for logging, directing, and management of all incidents. To support the National Call Centre in resolution of incidents and problems, each school will have a Help Desk and each province will have a Service Desk. It should be noted that, generally, the school's Help Desk is very unlikely to be an organizational entity. Rather, it will comprise defined responsibilities and processes that allow incidents to be reliably reported, logged, expedited, and resolved. Responsibility for performing the processes would typically be incorporated into existing roles (for example, in administration).

There are various options with regard to sourcing and procurement of the National Call Centre. This could either be established in-house (i.e. part of the e-Unit) or outsourced either within the public sector (i.e. SITA) or to the private sector. Due to the cost of establishing such a call centre, it is recommended that this function be outsourced.

4.2.3.2 Support Providers and their Responsibility

ICT Champions

The term 'ICT Champion' refers to the individual staff member at a school or FET College who is assigned overall responsibility for developing, overseeing, and driving implementation of the ICT Development Plan.

This staff member could be drawn from any of the job functions at a school or FET College. So, s/he may, for example, be a school principal, member of the FET College executive, head of department, or senior teacher responsible for IT and CAT in the school.

One of the ICT Champion's roles will be to act as the school or College point of contact with the e-Education Initiative. Another is to promote creative use of computers in the development of educationally meaningful projects. There are also administrative requirements, where the ICT Champion needs to work closely with school or College leaders to, for example:

- Produce an ICT Development Plan;
- Develop and ensure compliance with a code of conduct for computer usage within the school or College;
- Source and manage funding for ICT investments in the school or College;
- Support teachers and lecturers in articulating their professional development needs in relation to ICT skills;
- Facilitate development and implementation of individual professional development pathways for school and college staff;
- Agree and oversee timetabling and booking systems for the ICT resources available in the school or college;
- Act as a point of contact for reporting and resolving maintenance and technical support requirements; and

- Identify areas that can be enhanced by use of ICT and support implementation of suitable systems.

ICT Coordinators (Provincial / District)
The district level is viewed as a key component in providing support to individual schools and Colleges. Developing this capacity will be critical to success of the Initiative. Districts can guide schools and FET Colleges and facilitate creation of ICT Development Plans. However, it is important that each school or College takes full responsibility for its own plans and that the district does not impose solutions. The district office – provided it has the requisite capacity – is well placed to advise and guide schools and Colleges and to make use of transversal contracts for ICT model options. The district can also play a driving role in supporting capacity development, coordinating and streamlining procurement across schools, seeking to ensure broader district coherence to the process, and providing ongoing support to school and College managers.

ICT Coordinators need to work closely with school or FET College management to ensure that the best possible use is made of ICT resources and facilities. Their management roles consist of:
- Facilitating creation of ICT Development Plans for each school and FET College in the district;
- Monitoring and supporting implementation of ICT Development Plans;
- Supporting capacity development initiatives and professional development activities of relevance to the district;
- Coordinating and streamlining ICT procurement across the schools in the district;
- Supporting monitoring and evaluation activities pertaining to schools and Colleges in the district;
- Providing ongoing support to school and College managers on educational integration of ICT; and
- Providing local maintenance and technical support to schools and Colleges.

ICT Coordinators could also have various security functions, for example:
- Ensuring that the integrity of school or FET College data and systems is preserved by having adequate security policies and firewalls in place to protect against both internal (for example, from learners) and external threats;
- Having a network-wide anti-virus solution that is regularly updated;
- Ensuring that all servers and workstations are kept up to date with the required operating system updates and licensing agreements; and
- Creating backups of all important data on a regular basis, and keeping copies of these offsite.

Technical Support Process
Due to the nature of this Initiative and the unique structures within the Department, as well as the different levels of support (technical and other) that are required to be provided to schools, the following key role-players and levels have been identified:

Level	Role Player(s)	Type of Support / Resolution Ability
School	ICT Champion	1st Line support (10%)

District / Province	ICT Coordinators / Service providers	2nd Line support (30%)
National	Service providers / Administrators	3rd Line support (60%)

Based on research performed and the recommendations above, the envisaged support process will be as follows:

- The first port of call for management, administrators, educators, and learners will be the ICT Champion at the school, who will record and analyse the incident and provide first Line support if possible.
- If the ICT Champion cannot resolve the incident, the ICT Champion (or person with the problem) will report the incident to the National Call Centre, which will record and analyse the incident and provide second Line support if possible.
- If the National Call Centre cannot resolve the incident, the operator will assign the incident either to the ICT Coordinator or Service provider in the district or province or to system administrators or service providers at national level, who will provide third Line support.
- The person who was able to resolve the incident will close the call on the system. Should a call not be closed within the required service level (depending on the type of incident), the call will automatically be escalated to the next level, and ultimately to Steering Committee / Project Management level.

Responsibility charting (also known as RACI charting) is a methodology for determining roles and responsibilities in an organization. In executing activities in the process steps, the Responsibility Charting methodology distinguishes between four types of responsibilities. These can be described as follows:

- Responsibility 'R' – the individual who executes the task. This person is responsible for executing the task or for implementation. Several people can share responsibility for execution. In that case, the person with final responsibility (A) determines how the responsibility will be shared.
- Accountability 'A' – the individual with final responsibility. This person has decision-making authority and the right of veto.
- Consult 'C' – the individual who has to be consulted before an important decision or action is taken. This means two-way traffic in communication.
- Inform 'I' – the individual who has to be informed after a decision has been taken or a task has been executed. In this case, communication is one way.

Role Process Step	**First Line ICT Champion (School)**	**Second Line National Call Centre**	**Third Line ICT Coordinators / Administrators / Service Providers (Distr. / Prov. / Nat.)**	**Steering Comm. / Project Management (National)**
Acceptance and Registration	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	I
Prioritize	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	I
Assign	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	I

Analysis	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	I
Solution and Restoration	R / A (in 1st line)	R / A (in 2nd line)	C (in 1st & 2nd line) R (in 3rd line)	I
Close and Feedback	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	I
Notification to caller	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	I
Planning and coordination of incident handling	R / A (in 1st line)	R / A (in 2nd line)	R (in 3rd line)	A/ I

4.3 Capacity Requirements within the Department of Education

Resourcing requirements for attainment of the ICT infrastructure and connectivity output specification have been split into:

- Internal capacity required by the national and provincial Departments of Education to manage implementation of the e-Education Initiative; and
- The mechanism for management of the ICT Infrastructure 'pull' budgets – ICT credits.

4.3.1 Internal Capacity

Below, we outline the additional capacity requirements to support implementation of ICT infrastructure and connectivity within the e-Education Initiative at national, provincial, and district levels. Estimates of personnel numbers and their appropriate salary level have been provided, but it will be important to verify that the allocated notch levels are appropriate for the type of personnel needed.

4.3.1.1 National Department of Education

A small dedicated team is required to oversee e-Education ICT infrastructure and connectivity for schools and FET Colleges. To ensure that this is integrated into existing Department of Education structures, this would be best located within the e-Education Unit of the Department of Education. However, although a dedicated team would be located here, it would be required to collaborate closely with the other directorates to ensure that ICT is integrated across the various Branches of the Department of Education.

The main responsibility of this dedicated team will be to oversee management of ICT infrastructure and connectivity, and will be, among others, as follows:

- Development of policies, standards, and procedures with regard to implementation and use of ICT and Connectivity;
- Monitoring compliance with policies and procedures, as well as Norms and Standards of the Department;
- Implementation of ICT governance (availability, capacity, configuration, and so on);
- Management and monitoring of information security and identity management processes;
- Monitoring delivery of ICT infrastructure and connectivity services by the various service providers;

- Performing contract and SLA management;
- Ensuring integration between ICT infrastructure and connectivity activities and those of the other Pillars;
- Supporting the schools and FET Colleges in development of their ICT Development Plans;
- Assisting with the promotion of Open Standards and FOSS, as well as research and development of FOSS applications;
- Monitoring and assisting with the technical support provided by the Call Centre;
- Financial management (budget controls) of ICT infrastructure and connectivity provided during the 'push' strategy;
- Financial management of ICT infrastructure requested through ICT Development Plans and allocation of ICT credits as part of the 'pull' strategy;
- Development, issuing, and adjudication of tenders for the ICT infrastructure and connectivity services required; and
- Performing programme and project management tasks to assist the e-Education Unit as may be required from time to time.

Considering the envisaged roles of this dedicated team within the e-Education Unit of the National Department of Education, it would require the following additional personnel:

1) 1 Senior Manager: ICT Procurement and Management (salary level 13).
2) 5 Managers (salary level 12) and 9 Deputy Managers (salary level 10):
   a) Policy development and monitoring (including Norms and Standards);
   b) ICT Governance;
   c) Contract and Service Level Management;
   d) Information Security Management;
   e) Integration Management;
   f) Education Technology planning and ICT e-credit management;
   g) Open standards and FOSS migration;
   h) Call Centre and technical support;
   i) Financial and Procurement Management;
   j) Programme and Project management.
3) 2 administrators to support the above (salary level 5-7).

4.3.1.2 Provincial Departments of Education

Each provincial Department of Education requires a small dedicated team to oversee the e-Education ICT support team for schools and FET Colleges, in support of the e-Education Initiative. The main role of this team would be to assist the national team in execution of the above-mentioned tasks.

The following staff would be required for each provincial ICT Infrastructure and Connectivity team for the e-Education Initiative:

1) 1 Manager: ICT Procurement and Manager (salary level 12);
2) 2 Deputy Managers (salary level 10); and
3) 1 administrator (salary level 5-7).

4.3.1.3 District Capacity

The Provincial Targets for ICT Implementation Progress Report provides the following data on technical support and maintenance:[23]

Province	Number of Technical Support Personnel Available
Northern Cape	2 per district
North West	4
Limpopo	2 per district
KwaZulu Natal	1 for each of the 12 Education Centres
Gauteng	Unknown
Free State	2 (but posts not filled)
Eastern Cape	None
Western Cape	5 per district
Mpumalanga	Unknown

ICT provincial coordinators have been appointed in all nine provinces, at levels ranging from Director to Deputy Chief Education Specialist and First Education Specialist. Provinces are at various levels of progress in the process of appointing ICT coordinators, technical support, pedagogical support, and a teacher in each school as an ICT champion. Due mainly to budgetary constraints, provinces are at various levels of progress in appointing the required personnel.

Given this, no additional capacity is required at district level for implementation of ICT infrastructure and connectivity strategies for the e-Education Initiative. It is, however, assumed that each district will have at least two ICT Coordinators to assist the national and provincial teams, as well as to support schools and FET Colleges.

4.3.2 ICT Infrastructure 'Pull' Funding / Credits

All ICT infrastructure procured as part of the 'pull' strategy will be handled in the same way as procurement of eLTSM (see the section for eLTSM in the Curriculum and Content resourcing section of this report for details).

[23] Source: Provincial Targets for ICT Implementation Progress Report 2006/2007. Note that Mpumalanga data is not shown in the table, as the Provincial Targets for ICT Implementation Progress Report 2006/2007 has not yet been submitted by the Mpumalanga Provincial Department.

5 Governance Model for Professional Development

5.1 Introduction

The resourcing requirements for attainment of the professional development output specification have been split into:

- Internal capacity required by the national and provincial Departments of Education to manage implementation of the e-Education Initiative; and
- Capacity requirements for SACE in administration of the CPTD and e-PD credits system.

5.2 Internal Capacity

Below, we outline additional capacity requirements to support professional development within the e-Education Initiative at national, provincial, and district levels. Estimates of personnel numbers and their appropriate salary level have been provided, but it will be important to verify that the allocated notch levels are appropriate for the type of personnel needed.

5.2.1 National Department of Education

A small dedicated team is required to oversee e-Education professional development for schools and FET Colleges. To ensure that this is integrated into existing Department of Education structures, this would be best located within the e-Education Unit of the Department of Education. However, although a dedicated team would be located here, it would be required to collaborate closely with the other directorates to ensure that ICT is integrated within all the various Branches of the Department of Education, specifically the Teacher Education and Institutional Development Directorates within the General Education Branch of the Department of Education. The roles of this team would be to:

1) Issue and manage national tenders relating to the professional development Pillar of the e-Education Initiative, including:
   a) Tender A: Development of expanded guidelines for Training and Professional Development in ICT;
   b) Tender B: Development of priority learning materials to support initial educators training and ongoing professional development;
   c) Tender C: District ICT leadership training and support;
   d) Tender D: School ICT leadership training and support;
   e) Tender E: FET college ICT leadership training and support;
2) Liaise with provinces on ongoing professional development funding and budget allocations relating to:
   a) National norms and standards or guidelines for the allocation of e-PD credits;
   b) Matching e-PD credit allocations made by each province as an additional push strategy to stimulate provincial investment in e-Education professional development.

3) Raise funding for professional development push strategies of the e-Education Initiative, such as, for example, funding the ICT leadership programmes for district officials and schools and college managers, and supporting provincial allocation of e-PD credits.
4) Oversee the professional development work undertaken by SACE, including scoping the terms of reference and providing overall direction to SACE on:
   a) Design and management of the CPTD and related e-PD credit system for educators;
   b) Design and management of the CPTD and related e-PD credit system for non-educators (such as government officials, administrators, technical and maintenance staff in the schools and FET College sectors); and
   c) Design and management of the once-off HEI subsidies, in collaboration with the Higher Education branch of the Department of Education.
5) Oversee interaction of the e-Education Initiative with the Higher Education Branch of the Department of Education and HEIs to support HEIs in their fulfilment of the requirement to ensure that all educators entering the profession are developed to at least the Adaptation level. This would include:
      i) Liaising with the Higher Education Branch in the national Department of Education on E-Education issues for initial educator training in ICT;
      ii) Following up with all HEI Faculties of Education to ensure that all new educators enter the system with an Adaptation Level of ICT competence;
      iii) Engaging HEI Faculties of Education in planning processes for the attainment of this goal (linked to their submission of once-off subsidy applications below).
   b) Ensure that the professional development component of Thutong is fully functional, supports the professional development Pillar, and includes developed resources such as the professional development in ICT policy guidelines, available professional development offerings, and curriculum integration guidelines.
   c) Undertake the formal policy development and submission process for the expanded guidelines for training and professional development in ICT. This would be the final legislative process following the development of the guidelines outlined in Tender F.

Considering the envisaged roles of this dedicated team within the Teacher Education and Development Directorate of the National Department of Education, it would require the following additional personnel:

1) 1 Senior Manager: Professional development and curriculum & content support.
2) 2 managers (salary level 12):
   a) Professional development – Provincial;
   b) Professional development - District support;
   c) Professional development – Schools;
   d) Professional development – FET Colleges;
   e) Initial educator training – HE sector;
   f) Professional development and initial educator training – Materials development and knowledge management.
3) 1 administrator to support the unit.

5.2.2 Provincial Departments of Education

Each provincial Department of Education requires a small dedicated team to oversee e-Education professional development for schools and FET Colleges, in support of the e-Education Initiative. The roles of this team would be to:

a) Issue and manage provincial tenders relating to the professional development Pillar of the e-Education Initiative.
b) Provide provincial coordination and management of national tenders relating to the professional development Pillar of the e-Education Initiative, including provincial components relevant to the following:
   i) Tender C: District ICT leadership training;
   ii) Tender D: School ICT leadership training;
   iii) Tender E: FET college ICT leadership training;
   iv) Tender G: Audit of district level capacity to support ICT integration and recommended process for identification and recruitment for relevant district office support staff.
c) Source, ring-fence, and manage provincial professional development funding and budget allocations relating to professional development, including:
   i) Funding obtained via the e-Education Initiative for the professional development push strategies, such as District ICT leadership training, School ICT leadership training, FET college ICT leadership training and matching funding for e-PD credits;
   ii) Allocating e-PD credits to schools and FET Colleges; and
   iii) Interacting with SACE on the administration of e-PD credits for schools and Colleges in the provinces.
d) Provide reviews and feedback on the professional development work undertaken by SACE, including:
   i) Appropriateness and management of the CPTD and related e-PD credit system for educators; and
   ii) Appropriateness and management of the CPTD and related e-PD credit system for non-educators (such as government officials, administrators, technical and maintenance staff in the schools and FET College sectors).
e) Interact with the dedicated unit on e-Education professional development within the Teacher Education and Development Directorate of the national Department of Education.

The following staff would be required for each provincial professional development team for the e-Education Initiative:
1) 1 Manager (salary level 12) responsible for professional development as well as curriculum & content support
2) 1 Deputy Managers (salary level 10)
   a) Professional development – district and school support;
   b) Professional development – FET Colleges;
   c) Professional development funding – e-PD credits and CPTD processes;
   d) Professional development and initial educator training – provincial materials development and knowledge management.
3) 1 administrator to support the unit.

5.2.3 District Capacity

It has been recommended that districts play a central role in supporting schools and Colleges the adoption and integration of ICT across the curriculum areas. As such, all district level staff responsible for curriculum support will require e-Education training in their area of subject specialization. In addition, each district requires dedicated personnel to oversee e-

Education professional development for its own district office staff, and for its schools and FET Colleges, in support of the e-Education Initiative. The roles of this small district level professional development team would be to:

1) Ensure that ICT professional development offerings are communicated and integrated into the ICT Development Planning processes for Schools and Colleges (through the curriculum support personal at the district level);
2) Provide a district level contact point for the national and provincial professional development units;
3) Manage the logistics and operational requirements for professional development activities in the district;
4) Participate in the district level requirements for 'Tender G: Audit of district level capacity to support ICT integration and recommended process for identification and recruitment for relevant district office support staff';
5) Support district level staff in accessing appropriate professional development relating to ICT;
6) Interact with provincial professional development team on the allocation and use of e-PD credits and accumulation of CPTD points.

For national planning purposes, a typical district has been assumed to support 200 schools. The draft *Post Provisioning Norms for Districts* of January 2008 outlines that there are approximately 90 district level staff members who will work in the curriculum support services. These curriculum area staff will require support in their role in supporting schools to integrate ICT across the curriculum.

Consequently, the following is the recommended resourcing for professional development per district office (assuming that each district office services approximately 200 schools):

1) 4 Deputy Manager level positions (salary level 10):
   a) 3 focusing on ICT professional development – District staff support on professional development issues; and
   b) 1 focusing on ICT professional development – Provincial collaboration and management.

5.2.4 South African Council of Educators (SACE) Capacity

The e-Education Initiative will generate a requirement for large volumes of in-service professional development, and dedicated personnel will be required at SACE to manage its implementation and to ensure that targets are met. SACE would be expected to take responsibility for, amongst others:

1) Managing rollout of standardized national and/or provincial training where this is required (for example, implementation of a national programme to teach administrators about the use of SASAMS);
2) Facilitating development of a vibrant diverse professional development system to support educators of different kinds to develop their ICT competence to all defined levels of competence;
3) Approving relevant professional development activities for CPTD points for educators and non-educators;
4) Ensuring that the system used for CPTD points for educators is adapted and managed for non-educator personnel;

5) Managing allocation of e-PD credits for different professional development activities;
6) Quality-controlling automated submission of attendance and completion logs from professional development providers;
7) Handling and resolving queries and complaints logged by providers and educators; and
8) Establishing and managing an e-PD credit system in consultation with provinces and professional development agencies.

The following additional staff would be required for SACE to be able to fulfil this role:
1) 1 Senior Manager to oversee CPTD for e-Education (salary level 13).
2) 3 Managers (salary level 12):
   a) Manager – CPTD accreditation for professional development agencies for educators;
   b) Manager – CPTD accreditation for professional development agencies for non-educators;
   c) Manager – e-PD credits for districts and/schools;
   d) Manager – once-off HEI subsidy system (two-year, limited appointment for duration of subsidy system);
   e) Manager – Standardized national and provincial training.
3) 5 Deputy Managers for each of the above.
4) 5 administrators and/or data capturers.

In addition SACE will require additional budget to scale up its administrative capacity at key times, for example for the processing of large volumes of CPTD applications or to process e-PD credits. This administrative capacity is not required at all times of the year, but rather for intense periods following deadlines for applications. As such, rather than a dedicated post, an annual administrative contract budget should be allocated.

5.3 Professional Development Funding Mechanisms

5.3.1 HEI Once-Off Subsidies

HEI once-off subsidies are intended to enable HEIs to produce educators entering the profession to have the necessary skills. It is proposed that the following assumptions be applied to these subsidies:
1) Subsidies should be provided for a one-year plan.
2) Subsidies should be capped at R200,000 per HEI.
3) The once-off subsidy system would operate for two years, but each institution would only be eligible for one once-off subsidy during this period. This would ensure that institutions that do not make a successful application in the first year could receive grants in the subsequent year, having adapted their grant proposals satisfactorily.
4) Subsidies may be awarded for activities relating to enhancing the ICT integration into the programme offerings (i.e. teaching functions) for:
   a) Infrastructure;
   b) Curriculum and content – development and/or procurement;
   c) Professional development for lecturers and academics relating to ICT integration (including exchanges);
   d) Research which results in the development of professional development guides or learning materials.

5.3.2 e-PD credits

e-PD credits are to be used as a key incentive mechanism for both educators and non-educators to engage in e-Education professional development opportunities. Educators wanting to participate in professional development offerings will have these contribute to their CPTD points and can also have their costs covered via e-PD credits. For school-based or College-based personnel, this application would be made via the school or College in its ICT Development Plan. For office-based educators in the national and provincial departments and at district level, application for e-PD credits to pay for e–education professional development offerings would be made via relevant structure (national, provincial or district). As such, there is a need to have an available funding pool for e-PD credits, which are administered via the districts and then the province.

6 Governance Model for Curriculum and Content

6.1 Introduction

Resourcing requirements for attainment of the curriculum and content development output specification have been split into:

- Internal capacity required by the national and provincial Departments of Education to manage implementation of the e-Education Initiative; and
- Capacity required for management and development of the Thutong portal.

Internal Capacity

Below, we outline the additional capacity requirements to support curriculum and content within the e-Education Initiative at national, provincial, and district levels. Estimates of personnel numbers and their appropriate salary level have been provided, but it will be important to verify that the allocated notch levels are appropriate for the type of personnel needed.

6.1.1 National Department of Education

A small dedicated team is required to oversee e-Education curriculum and content issues. To ensure that this is integrated into existing Department of Education structures, this small team would be best located within proposed new e-Education Unit of the national Department of Education. However, although the head of the dedicated team would be located here, it would be required to collaborate closely with the following directorates:

- The GET Schools Directorate within the GET Branch for GET curriculum issues;
- The School Curriculum Directorate within the FET Branch for FET schools curriculum issued; and
- The Public FET Colleges directorate within the FET Branch for FET College curriculum issues.

As such, various members of the team would be located within the relevant directorates and would have primary management reporting to these structures. Their secondary management reporting would be to the e-Education Unit Curriculum and Content.

The roles of this team would be to:

1) Issue and manage national tenders relating to the content and curriculum Pillar of the e-Education Initiative, including:
   a) *Tender A: Review of the current curriculum to develop guidelines, assessment tools, and resourcing plans:*
      i) Identify how and where ICT is required to support attainment of the entire curriculum.
      ii) Describe and quantify the resulting resource implications for each GET phase and FET schools and FET Colleges
      iii) Develop a benchmark set of ICT competencies for learners in schools and FET Colleges.

iv) Develop a set of curriculum guidelines and assessment tools to support educators in integrating ICT into each curriculum area. This may be done for each learning area within a GET phase, for each grade for FET Schools and for each NQF level for FET schools. The guidelines and tools will include:
   (1) ICT competency benchmark frameworks;
   (2) Guidelines to provide support to educators on using ICT to support attainment of the curriculum statements and FET College programme; and
   (3) A series of standardized ICT skills assessment rubrics for each phase in GET level and each grade or NQF level at FET level.

b) *Tender B: Content development tenders for priority content development processes*
c) *Tender C: Commercial relationship for online ordering of LTSMs*

2) Liaise with provinces on ongoing e-LTSM funding and budget allocations relating to:
   a) National norms and standards or guidelines for the allocation of e-LTSM credits;
   b) Matching e-LTSM credit allocations made by each province as an additional push strategy to stimulate provincial investment in e-Education professional development.
3) Oversee design, management, and content development for Thutong, the national education portal, including scoping the terms of reference and providing overall direction to Thutong service providers on:
   a) Hosting;
   b) Technical design and maintenance; and
   c) Content management.
4) Support uptake and effective use of the Thutong portal by national, provincial, and district level officials, as well as educators and learners at schools and FET Colleges. This will include, but not be limited to:
   a) Managing work of Thutong Portal Development coordinators in identifying and appointing Learning Space Managers and Critical Advisors for Thutong Learning Spaces and marketing and supporting effective use of Thutong;
   b) Developing and advocating for a government policy that any government department (national or provincial) commissioning development of educational materials should be required to house the resulting materials, as well as the underlying digital assets, in Thutong so that they can be accessed by any other government department and by the public;
   c) Advocacy and support at national provincial and district level for use of Thutong as communication and content distribution channel.
   d) Ensure that the Thutong portal is integrated into the functioning of the Department of Education and that a wide range of relevant departmental officials are engaged as Learning Space Managers and critical Advisors as part of their job functions.
5) Oversee curriculum and content push strategies of the e-Education Initiative, such as, for example:
   a) Funding the development of electronic content to support priority areas.
   b) Identifying specialized subjects where distance learning methods will be appropriate for the school and College sectors, to supplement the non-availability of subject specialists at individual schools and Colleges. Where it is merited, the Department should partner with an identified distance education provider to support the development of Learning Management Systems and associated educational materials and management processes for these offerings (as per Output 30 of the Needs Analysis).

6) Oversee interaction of the e-Education Initiative with the relevant Branches and directorates for the national Department of Education, pertaining to issues of relevance to e-Education Initiative curriculum and content, including but not limited to:
   a) Social and School Enrichment Branch directorates (Health Education, Rural Education, gender, Race and Values, etc);
   b) GET Schools, District Development, Inclusive Education and Database Management, and School Management and Governance Directorates of the GET Branch;
   c) FET Public Colleges, School Curriculum, FET Planning and Policy of the FET Branch;
   d) Financial Planning and EMIS Directorates for the System Planning and Monitoring Branch.
7) Provide support to the relevant directorates of the national Department of Education, where tenders for the development and/or licensing of standardized ICT applications are required.
8) Negotiate bulk licensing agreements for educational titles and support negotiation of bulk licensing agreements with relevant software vendors for ICT applications for use across the schooling or College system (as conducted by the Administration Branch). This will include negotiations as required by the recommendations emerging from the FOSS migration strategy.

Considering the envisaged roles of this dedicated team within the e-Education Unit of the National Department of Education, it would require the following additional personnel:

1) 1 Senior Manager: Professional development and curriculum & content support.
2) 6 Managers (salary level 12):
   a) Thutong Portal manager, who will be responsible for:
      i) Management of hosting relationships and contracts for Thutong.
      ii) Management of technical maintenance and development contracts for Thutong.
      iii) Integration of Thutong portal departmental content management processes into the national Department of Education, including:
         (1) Supporting national, provincial and district level officials in the effective use of the Portal as a communication channel; and
         (2) Managing Learning Spaces using existing national, provincial and district level curriculum support staff.
      iv) Management of curriculum resource development and acquisition and the development of comprehensive learning materials for priority areas including:
         (1) Secondment of educators to support curriculum resource development, acquisition, and translation processes;
         (2) Management of contracts for development of comprehensive learning materials for priority areas;
         (3) Use of national and provincial Department of Education officials as Learning Space Managers and Critical Advisors;
         (4) Integration of all content developed by the Department of Education into the Thutong platform; and.
         (5) Establishment and management of relationships with not-for-profit, commercial and parastatal educational content developers, to negotiate access and or bulk licensing of educational content to be integrated into the Thutong platform.;

b) Curriculum and Content: Licensing and e-LTSMs management. This role would include responsibility for:
   i) The FOSS migration strategy;
   ii) Negotiation of bulk licensing for educational titles, support on bulk licensing and standardized ICT applications development as located in the Administration Branch;
   iii) e-LTSM approval processes (including review and approval of relevant FOSS products);
   iv) The online LTSM ordering system.
c) Curriculum and Content: Curriculum, District, and Provincial support management. This role would include responsibility for coordinating:
   i) Provincial and district support for schools in collaboration with the District Support Directorate of the GET Schools Branch;
   ii) Provincial support for FET Colleges in collaboration with the Public FET Colleges Directorate of the FET Branch; and
   iii) Guidelines and assessment frameworks and support for schools and FET Colleges in collaboration with the Directorates for Examination support and management, GET and ABET assessment and examinations, and FET assessment and examinations in the FET Branch.
d) Curriculum and Content: Special Priorities management. This function would work in close collaboration with the Social and School Enrichment Branch, and would coordinate all initiatives pertaining to special priorities that cut across or fall outside of the curriculum statements, such as consideration for Health Education, Inclusive Education, Rural Education, Multi-grade Education, and so on.
e) Curriculum and Content: External Relationships management. This function would be responsible for formalizing and managing partnerships of relevance to the Curriculum and Content pillar of the e-Education Initiative. These would include, but not be limited to:
   i) Partnership with an identified distance education provider to support the development of Learning Management Systems and associated educational materials and management processes for identified Distance Education programmes in support of the FET school and vocational curriculum;
   ii) Relationships and sponsorships from donors and corporate social investment initiatives to sponsor and partner on content development processes;
   iii) Negotiation marketing and/or advertising revenue from allowing limited marketing exposure on, for example, a sponsored link on Thutong or an advertisement placement on the back covers of printed materials;
   iv) Brokering relationships for use and/or adaptation of existing content that could support the South African curriculum from NGOs, Corporate Social Investment Initiatives, international and local materials developers;
   v) Responding to international requests (particularly from SADC countries) pertaining to adaptation, licensing, and/or use of South African curriculum materials or expertise for use in the region.
f) Management will also be responsible for: Intellectual Property and Copyright to support the Thutong Portal Director in securing copyright for digital content to be included in Thutong.

3) 6 Deputy Managers: Thutong Portal Development Coordinators. These full-time appointments would support the Thutong Portal Manager, and be responsible for

a) Coordinating and supporting the cooption of national, provincial, and district departmental officials to function as Learning Space Managers and Critical Advisors within Thutong;
b) Functioning as Learning Space Managers for a limited number of Learning Spaces;
c) Sub-contracting external people to perform as Learning Space Managers and Critical Advisors where capacity for this does not exist internally within the Department of Education;
d) Conducting ongoing advocacy and marketing of the portal;
e) Supporting use of the Thutong portal as a communication channel by the national and provincial Departments of Education; and
f) Managing seconded educators for curriculum resource development and structured content development and acquisition.

4) 2 administrators to support the unit.

6.1.2 Provincial Departments of Education

Each provincial Department of Education requires a small dedicated team to oversee e-Education curriculum support and content for schools and FET Colleges, in support of the e-Education Initiative. The roles of this team would be to:

f) Issue and manage provincial tenders relating to the content and curriculum Pillar of the e-Education Initiative.
g) Provide provincial feedback and review of execution of national tenders relating to the content and curriculum Pillar of the e-Education Initiative, including provincial components relevant to the following:
   i) Provincial interpretations and adaptations and use of curriculum guidelines and assessment tools; and
   ii) e-LTSM online ordering system.
h) Source, ring-fence, and manage provincial e-LTSM funding and budget allocations relating to curriculum and content, including:
   i) Funding obtained via the e-Education Initiative for the curriculum support and content push strategies, such as e-LTSM credits; and
   ii) Allocating e-LTSM credits to schools and FET Colleges.
i) Provide reviews and feedback on the work undertaken for Thutong, and support districts and schools in the use of Thutong.
j) Interact with the dedicated team on e-Education curriculum support and content within the Curriculum Innovation Directorate of the national Department of Education.

The following staff would be required for each provincial curriculum and content team for the e-Education Initiative:

4) 1 Manager (salary level 12) responsible for professional development as well as curriculum & content support
5) 1 Deputy Manager (salary level 10).
6) 1 administrator.

It is assumed that this small team would drive the curriculum support and content requirements of the e-Education Initiative by using personnel within the existing curriculum units of provincial Departments of Education.

6.1.3 District Capacity

It has been recommended that districts play a central role in supporting schools and Colleges with adoption and integration of ICT across curriculum areas. As such, the professional development Pillar of the e-Education Initiative includes both pull (e-PD credits for districts) and push (ICT leadership training and support for direct officials), to ensure that these personnel are equipped to play this support role.

Given this, no additional district capacity is required at district level for implementation of curriculum and content strategies for the e-Education Initiative. This does not mean that district personnel will have no role in supporting curriculum and content issues. Curriculum and content issues will form a key part of ICT Development Planning, and should be considered as one of the key areas were districts provide support to Schools and Colleges as part of their job functions.

The job descriptions of all curriculum support personnel at district level should include obligations to support the objectives of the e-Education Initiative. Their roles in this regard would be to:

1) Ensure that e-Education curriculum guides are available, accessed, and used by educators in their schools;
2) Ensure that educators they support are aware of and able to use Thutong, access its resources, and participate in its Learning Spaces;
3) Ensure that schools and Colleges are allocated and able to make use of their e-LTSM credits;
4) Ensure that schools and Colleges are able to make use of the online LTSM ordering system;
5) Provide a district-level contact point for the national and provincial e-education curriculum and content teams;
6) Support district level staff in accessing appropriate professional development relating to integration of ICT across the curriculum and selection and use of e-LTSMs;
7) Interact with provincial curriculum and content team on the allocation and use of e-LTSM credits.

6.2 Thutong Portal

In order to outline the resourcing implications of the Thutong education portal, it is important to understand its broad vision:

> Thutong will seek to provide teachers, school managers and administrators, and national and provincial education officials' access to high quality resources and information of direct and specific relevance to the South African National Curriculum Statement and associated education policies. Its key focus will be on creating strong and vibrant online communities of practice amongst the above target audiences, in order to facilitate discussion and sharing of information and ideas amongst peer networks, and in an effort to encourage South African educators to develop and improve education by sharing the country's common intellectual capital.

Within this broad vision, Thutong already has four primary sections:

1) Curriculum – this is the core engine of Thutong, providing access to a wide range of resources, tools, and services through carefully constructed and managed Learning Spaces.
2) Professional Development – this section focuses on providing educators access to resources, tools, and services that are designed to facilitate their ongoing professional development. It will be designed explicitly to support the Department of Education's policies around CPTD.
3) Administration – this section aima to support school administrators by providing access to resources, tools, and services for this community. A key focus in this regard will be on supporting rollout of the South African School Administration and Management System (SA-SAMS).
4) Education Management – this section focuses on supporting school managers. Its primary initial focus is on supporting the implementation of the new Advanced Certificate in Education for School Principals.

Thutong is organized around *Learning Spaces*, which are dedicated learning area/subject spaces clustering resources and services in ways that are intuitively logical to the primary target audience of school teachers and FET lecturers.

Given the above vision, resourcing for Thutong can be described in relation to the following categories:
1) Overall management.
2) Hosting.
3) Technical maintenance and development.
4) Content Management:
   a) Curriculum resource development and acquisition and development of comprehensive learning materials for priority areas;
   b) Using the portal as a communication channel; and
   c) Building and managing Learning Spaces.

6.2.1 Overall Management of Thutong

Overall management of Thutong will lie within the national Department of Education. As described above, the e-Education Initiative will have its primary locus in a new e-Education Unit of the Department of Education. Within this e-Education Unit, there will be a Senior Manager responsible for curriculum and content support, as well as professional development. Overall management of the Thutong portal will be the responsibility of this Senior Manager who will be supported by 3 Managers and 6 Deputy Managers (Thutong Portal Development Coordinators) as described above.

It is important to note that the option to establish a dedicated parastatal to manage Thutong has been considered, but has not been pursued for two main reasons:
- Establishing and sustaining a new parastatal is expensive and time-consuming.
- The functioning and effective use of Thutong is a core function of the Departments of Education. Removing responsibility for this by locating it within a separate (albeit parastal) entity is thus not considered desirable. For Thutong to work, it needs to be integrated into the knowledge management systems and related communication strategies of the Department of Education.

As such, we have presented a recommendation for Thutong to be managed from within the Department of Education. However, understanding the advantages of outsourcing key elements of its functioning where specific skills are required that are unlikely to be easily retained at the requisite level within a government department, we have recommended that long-term outsourcing relationships be established for key elements of its overall management. These are described below.

6.2.2 Hosting of Thutong

Hosting of the Thutong portal should be provided by the SITA. As the Thutong portal is a government site, it needs to be managed according to government security standards, hosting protocols, and policies. Hosting includes bandwidth, rental of hardware, backup of data, firewalls, and all relevant security to ensure that the portal is accessible to the Department of Education, educators, learners and school and College communities with reasonable download times.

The following assumptions have been made with regard to costing the hosting of the Thutong portal:

- As schools and Colleges gain better and more ubiquitous access to ICT, uptake and traffic on the portal is set to increase substantially over time.
- Bandwidth and related hosting costs are set to decline substantially over time.
- The monthly cost for hosting the Thutong Portal in 2009 is estimated at R30,000 per month.
- Taking into account the above, an additional escalation of 10% increase per year can be expected in hosting costs over time.

6.2.3 Technical Maintenance and Development of Thutong

Technical maintenance of the Thutong Portal refers to the services required to maintain the current technological structures and tools of the portal. Currently these include: system reviews; technical support provided as and when necessary to maintain all aspects of the current portal, including enhancement on the Learning Spaces, error resolution, resource extraction; link integrity checks; ongoing support of current functionalities, functionality changes: system updates quality control systems, reporting on usage; and relationship management. Technical development of Thutong refers to the ongoing requirement to improve and expand functionality of the portal to accommodate new processes, databases, and Learning Spaces as conceptualized by various directorates within the national Department of Education, as well as relevant officials in provincial Departments.

Emanating from the e-Education Initiative requirements, the Thutong Portal will need to develop the following additional functionality:

1) Alignment with the CPTD points system and e-PD credits system as developed and administered by SACE to support professional development (to align with point eight above);
2) Development of tools and templates to allow each school to establish its own web presence, and related database of South African schools which links to these and existing school websites;

3) Development of an online LTSM approval system for the GET band (as is currently in development for the FET band); and
4) Integration of the LTSM approval system with an online LTSM ordering and delivery service (the design for this will be administered separately from Thutong, however the interface on approved LTSMs on Thutong needs to link seamlessly with this service).

6.2.4 Content Management and Development for Thutong

Content management for Thutong may be considered to comprise of the following:

- Developing and acquiring curriculum resources and comprehensive learning materials for priority areas;
- Supporting Departmental of Education officials to use the Portal as communication channel; and
- Building communities of practice at national, provincial, district, school and FET College levels including management of learning spaces.

There will be overlap between these three areas, and as such the resourcing recommended for each area assumes that there will be a single content management strategy for Thutong. This strategy will, however, need to make use of the following:

- Seconded educators, who will have the requisite content knowledge in their content area specialization to be able to identify resources and associate them with the appropriate curriculum topics, outcomes, and assessment standards.
- Seconded educators, who will have African language competence and be able to translate and adapt English materials into the other ten South African languages.
- Professional materials development, instructional design, and project management teams that are able to work within the South African context to make contextually relevant and rich educational materials to support the South African curriculum. Such teams should include people skilled in large-scale project management, educational publishing, and multimedia development.
- Subject matter experts with content knowledge and classroom teaching or lecturing experience, who are able to work in creative team to develop materials to support specific content areas (learning areas, subjects, or courses). These may be either educators or existing non-governmental or private organizations that have specific expertise in an identified niche area of content.

6.2.4.1 Developing and Acquiring Curriculum Resources

Responsibility to ensure that curriculum resources are developed and acquired for Thutong will be the responsibility of the national Department of Education. This will be done through two key strategies:

- Use of Learning Space Managers and Critical Advisors to stimulate participation in Thutong Learning Spaces. These are not full-time roles, and, wherever possible, Departmental officials at national, provincial, and district levels will be expected to fulfil these roles as part of their job descriptions.
- Managing a series of tenders for development of comprehensive learning materials for priority areas.

Thutong is organized around *Learning Spaces*, which are dedicated learning area/subject spaces clustering appropriate resources and services. When a new Learning Space is created,

a Learning Space Manager (LSM) will appointed by the relevant Thutong Portal Development Coordinator. The Learning Space Manager will have the following ongoing tasks:

1) Determine the combination of tools required and used within the space (Blogs, Lists, and so on).
2) Determine layout of tools and spaces within the Learning Space.
3) Take overall responsibility for administration of various tools depending on selection made:
   a) Creation of monthly newsletter;
   b) Addition of news and events to the notice board facility;
   c) Creation and management of new forums and blogs;
   d) Moderation of user responses in online forums;
   e) Maintenance of FAQ facility; and
   f) Glossary maintenance.
4) Provide quality control, with support from Critical Advisors as appropriate, for resources being added to the Portal through the Learning Space.
5) Take an active role in encouraging the participation of members.
6) Inform Thutong Administrators of any members to be appointed as Critical Advisors.
7) Keep a list of creative ideas and brief in new tools to be developed as demand arises and time permits.
8) Perform all of the roles of Critical Advisors, Learning Space Community Members, and Public Users.

Managing a single learning space is not considered a full-time job for any one individual. For purposes of planning, Learning Space Management is estimated to be between 15-20% of a full-time equivalent role. Learning Space Managers (LSM) will be able to appoint trusted individuals as Critical Advisors, in order to spread the work load of managing Learning Spaces. These might be Departmental Officials at district, provincial, or national level, excellent teachers, or noted experts in their field.

It is assumed that, over time, Learning Space Management and Critical Advisor Support will be written into the job descriptions of existing curriculum support personnel in Department of Education structures. As such, it is expected that only 20% of Learning Spaces will require sub-contracted Learning Space Managers (for which a dedicated budget allocation is required). This process for appointing and incentivizing Learning Space Managers and Critical Advisors will be coordinated by the Thutong Portal Development Coordinators.

Thutong Portal Development Coordinators will also be able to make use of a budget for:

- Incentives, marketing, and give-aways to encourage participation in Learning Spaces.
- Travel to allow Coordinators to engage and support newly appointed Learning Space Managers and Critical Advisors, as well as to participate in conferences and other relevant events.

It is expected that the number of Learning Spaces on Thutong will grow over time, as more subjects, learning areas and courses are added and active communities of practice emerge. The following growth of the number of Thutong Learning Spaces is considered feasible over ten years, given the current rate of development of Learning Spaces.

Table 1 Envisaged Growth of Learning Spaces Over Time

	Number of managed Learning Spaces
Year 1 (2009)	20
Year 2	60
Year 3	100
Year 4	140
Year 5	180
Year 6	220
Year 7	260
Year 8	300
Year 9	300
Year 10	300

As a key strategy for ensuring that Thutong is populated with learning materials to support the South African curriculum statements, a series of systematic investments in open educational materials to provide comprehensive curriculum support for priority learning areas is envisaged. For the purpose of this document, these are referred to as *Tender B: Content development tenders for priority content development processes* and are to be issued and managed by the e-Education Unit of the national Department of Education.

6.2.4.2 Supporting Departmental of Education Officials to Use the Portal as a Communication Channel

It is expected that effective use and integration of Thutong into daily functioning of the national department of Education will cut across all department Branches and Directorates. As such, all national, provincial, and district Education personnel will be expected to use the Thutong portal as a communication channel for their existing job functions. To list a few possible examples:

- A district level subject advisor may set up a closed distribution list on the FET mathematics learning space to manage their communication with maths teachers within their district;
- A curriculum specialist at a provincial level may post a bulletin or publicise and event in the province in the relevant learning space;
- The School Safety and Enrichment programmes directorate may set up a learning space, or use the curriculum learning spaces to communicate directly with schools and identified teachers or FET lectures on their programmes;
- Draft policy emanating from the various departmental directors may be published for public comment on the Portal, and resulting feedback managed and collated through the Portal facilities.

Using Thutong in this way will take time, and uptake will differ from directorate to directorate, from province to province, and from district to district. This process will be supported through the various professional development and change management processes identified as e-Education initiative strategies. Consequently, no additional capacity is being allocated for this function, but it is assumed that every departmental official will discover that tasks being done in one way previously will now require use of the Thutong Portal. As has

been noted, the full-time Thutong Portal Development Coordinators will be expected to support this work as part of their job description.

6.2.4.3 Seconding Educators to Support Content Development, Translation, and Acquisition

A key strategy to support development and management of content for the Thutong Portal is making use of seconded educators. These educators will be managed by the Thutong Portal Directorate, and intended to support all content management and development processes as outlined above.

First, ten educators with African language competence will be required who will be able to translate and adapt English materials into the other ten South African languages are required to support the work of the Thutong Portal Directorate.

Second, management of up to 300 Learning Spaces is envisaged on Thutong, together with development of an estimated 500 priority curriculum resource packages to support the South African schools and FET College curriculums (as outlined in Tender B) over ten years. As such, it is considered reasonable to assume that one seconded educator would be required to support the content development process for each priority area. So, 50 seconded educators would be required to support content management and development processes for Thutong per year.

Considering language experts, as well as general content managers and developers, up to 60 seconded educators will be required per year. As language translation and materials development is a high level skill and as educators may need to be incentivized to take on seconded positions, Deputy Manager (salary level 10) is considered appropriate for the annual salary for seconded educators.

7 Governance Model for Monitoring, Evaluation, and Research

7.1 Internal Capacity

Below, we outline the additional capacity requirements to support monitoring, evaluation, and research within the e-Education Initiative at national, provincial, and district levels. Estimates of personnel numbers and their appropriate notch level have been provided, but it will be important to verify that allocated salary levels are appropriate for the type of personnel needed.

7.1.1 National Department of Education

A small dedicated team is required to oversee e-Education monitoring, evaluation, and research for schools and FET Colleges. To ensure that this is integrated into existing Department of Education structures, this small team would be best located within the proposed new e-Education Unit of the national Department of Education. Although the head of the dedicated team would be located here, it would be required to collaborate closely with the following directorates:

- The System Planning and Monitoring Branch; and
- The Administration Branch and its provincial and national Communication Directorate in particular.

As such, various members of the team would be located within the relevant directorates, and would have primary management reporting to these structures, their secondary management reporting would be to the e-Education Chief Director Knowledge Management.

The roles of this team would be to:

1) Oversee design and manage development and ongoing implementation of the monitoring, research and evaluation framework for the e-Education Initiative;
2) Manage input and contributions of the multi-stakeholder body reviewing and guiding implementation of the framework;
3) Issue and manage national monitoring, evaluation, and research tenders as agreed through establishment of the e-Education research, monitoring, and evaluation framework;
4) Liaise with provinces on monitoring, evaluation, and research and related communication and resources on e-Education;
5) Oversee interaction of the e-Education Initiative with the relevant Branches and directorates of the national Department of Education on issues of relevance to e-Education Initiative monitoring, evaluation, and research; and
6) Ensure that the e-Education Unit has a coherent knowledge management and communication strategy which cuts across its various Pillars.

This dedicated team will require the following additional personnel:

1) 3 Managers (salary level 12):
   a) Primary Schools' Monitoring and Evaluation Director, who will be responsible for:
      i) Managing internal (departmental) monitoring processes and reporting on e-Education for primary schools;

ii) Managing external evaluation processes and reporting on e-Education for primary schools;
iii) Contributing to the research agenda and drawing on research outputs relating to primary schools;
iv) Contributing to the communication strategy for disseminating and communicating monitoring, evaluation and research findings and e-Education progress with regard to primary schools to various stakeholders (national, provincial district, schools).

b) Secondary Schools' and FET College Monitoring and Evaluation Director, who will be responsible for:
i) Managing internal (departmental) monitoring processes and reporting on e-Education for secondary schools and FET Colleges;
ii) Managing external evaluation processes and reporting on e-Education for secondary schools and FET Colleges;
iii) Contributing to the research agenda and drawing on research outputs relating to secondary schools and FET Colleges;
iv) Contributing to the communication strategy for disseminating and communicating monitoring, evaluation and research findings and e-Education progress with regard to secondary schools and FET Colleges to various stakeholders (national, provincial district, schools, FET Colleges).

c) Research, Communication, and Knowledge Management Director, who will be responsible for:
i) Driving the overall monitoring, evaluation, and research framework;
ii) Managing all research contracts;
iii) Ensuring that cross-cutting issues are included and reported in the monitoring, evaluation, and research framework;
iv) Collating input from the schools and FET Colleges monitoring and evaluation outputs to provide coherent e-Education progress statements;
v) Collaborating with relevant directorates in the Administration and System Planning and Monitoring Branches on research processes to ensure that reports required by national department structures (such as the e-Barometer of the President's National Commission on Information Society and Development) and international organizations (such as UNESCO and NEPAD) are met through the e-Education monitoring and evaluation framework;
vi) Contributing to the e-Education communication strategy for disseminating and communicating monitoring, evaluation, and research findings and e-Education progress to various stakeholders (national, provincial, FET Colleges),
vii) Overall data management for monitoring, evaluation, and research for the e-Education Initiative.
viii) Knowledge management and communications support for the various e-Education units (curriculum and content, professional development, ICT infrastructure and so on). While this will be the responsibility of each directorate, the Communications and knowledge management director will provide style guides, templates and processes to ensure a consistency in approach across the e-Education Unit.
ix) Developing and supporting the use of style guides, templates and communication formats that can be used across the monitoring, evaluation and research activities to ensure a consistent e-Education style and branding.

x) Designing and managing a communication strategy to disseminate monitoring, evaluation and research findings and progress in useable formats for various audiences. This should include (but not be limited to):
   (1) Managing the e-Education Unit website as a Learning Space within Thutong (with contributions from all staff);
   (2) Detailed monitoring, evaluation, and research reports;
   (3) Quick guide series on specific monitoring, evaluation, and research topics;
   (4) Journal publications;
   (5) Guides and tools for use in Schools and FET Colleges;
   (6) E-Education newsletters (electronic and/or print);
   (7) Conference presentations from e-Education staff members (national, provincial or district level);
   (8) Liaison with professional development agencies to ensure that monitoring, evaluation and research outputs are used to inform the professional development offerings.

7.1.2 Provincial Departments of Education

Each provincial Department of Education requires a small dedicated team to oversee e-Education monitoring, evaluation, and research in support of the e-Education Initiative. The roles of this team would be to:

a) Issue and manage provincial tenders relating to the monitoring, evaluation and research Pillar of the e-Education Initiative.
b) Provide provincial feedback and review of execution of national tenders relating to the monitoring, evaluation and research Pillar of the e-Education Initiative.
c) Interact with the dedicated team on e-Education monitoring, evaluation, and research within the e-Education Unit of the national Department of Education.

One provincial monitoring, evaluation, and research person will be required for each province. It is assumed that this person will drive the monitoring, evaluation and research requirements of the e-Education Initiative by using existing personnel within provincial Departments of Education where required.

7.1.3 District Capacity

It has been recommended that districts play a central role in supporting schools and Colleges with adoption and integration of ICT across the curriculum areas. In supporting schools and Colleges, they will also play a key role in monitoring implementation of their ICT Development Plans and their e-maturity levels. As such, the professional development Pillar of the e-Education Initiative includes both pull (e-PD credits for districts) and push (ICT leadership training and support for direct officials), to ensure that these personnel are equipped to play this monitoring and support role.

Given this, no additional district capacity is required at district level for implementation of monitoring, evaluation, and research strategies for the e-Education Initiative. This does not mean that district personnel will have no role in monitoring, evaluation, and research. Monitoring will form a key part of ICT Development Planning, and should be considered as

one of the key areas were districts provide support to Schools and Colleges as part of their job functions.

The job descriptions of all curriculum support personnel at district level should include obligations to support the objectives of the e-Education Initiative. Their roles in this regard will be to:

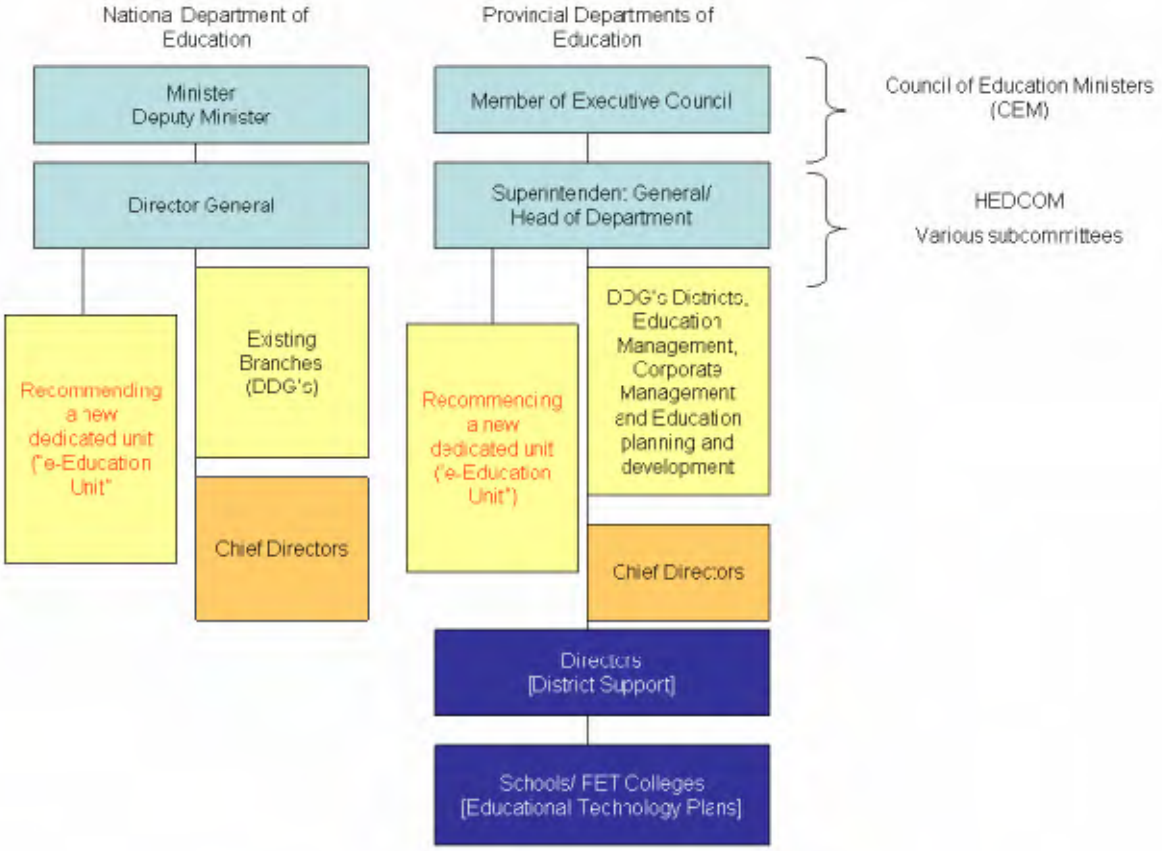
1) Ensure that the e-Education communication strategies are working and that monitoring, evaluation and research outputs are available, accessed, and used by educators in their schools and FET Colleges;
2) Ensure that educators are involved in monitoring their progress with regard to their ICT Development Plans;
3) Ensure that educators are involved in monitoring their e-maturity levels and progress in integrating ICTs across the curriculum;
4) Provide logistical support to research and evaluation agencies in terms of participating in the research and evaluation processes and facilitating access to schools and FET Colleges as required;
5) Provide a district-level contact point for the national and provincial e-education monitoring, research and evaluation teams.

8 Governance Model and Structure for the Overall Initiative

8.1 Introduction

Based on the above analysis, a series of recommendations can be made about the proposed governance structure for the e-Education Initiative, combined with human resourcing requirements for the proposed e-Education Units that will exist at national and provincial levels.

The diagram below depicts recommended additions to the existing structure of the Department of Education in respect of the e-Education Unit:



The various responsibilities and tasks that need to be undertaken to manage the overall e-Education Initiative can broadly be divided into three main functions:

- Partnership management, which is concerned with structures of accountability and how the e-Education Unit and its various stakeholders relate to each other.
- Service delivery management, which can be described as the systems and procedures designed to manage risk and performance.
- Contract administration, which relates to the administrative processes required to ensure that all procedures contained in contracts and all documentation relating to contracts are effectively managed.

In practice, there will be considerable overlap between these functions, and they will often need to be undertaken simultaneously at any particular phase of the Initiative. Nevertheless, an understanding of the purpose of each function and required competencies will clarify further the responsibilities of the e-Education Unit and enable it to assemble a management team with the necessary attributes.

8.1.1 Key Responsibilities

8.1.1.1 Accounting Officer

The main responsibilities of the accounting officer/authority will be to:

1) Mobilize support for the Initiative amongst politicians and other key stakeholders;
2) Establish an e-Education Unit, to ensure management continuity through each stage of the Initiative;
3) Obtain relevant approvals from the National Treasury, as required in terms of the PFMA;
4) Sign applicable contracts;
5) Delegate necessary powers after the Initiative has been approved to enable implementation of the Initiative;
6) Resolve any disputes which the e-Education Unit is unable to settle;
7) Provide executive commitment to sound partnership management;
8) Provide financial oversight and ensure that the Initiative continues to operate in the public interest after implementation has commenced; and
9) Report on the management of the Initiative in the Institution's annual report.

8.1.1.2 Head of the e-Education Unit

Primary responsibilities of the Head of the e-Education Unit will be to:

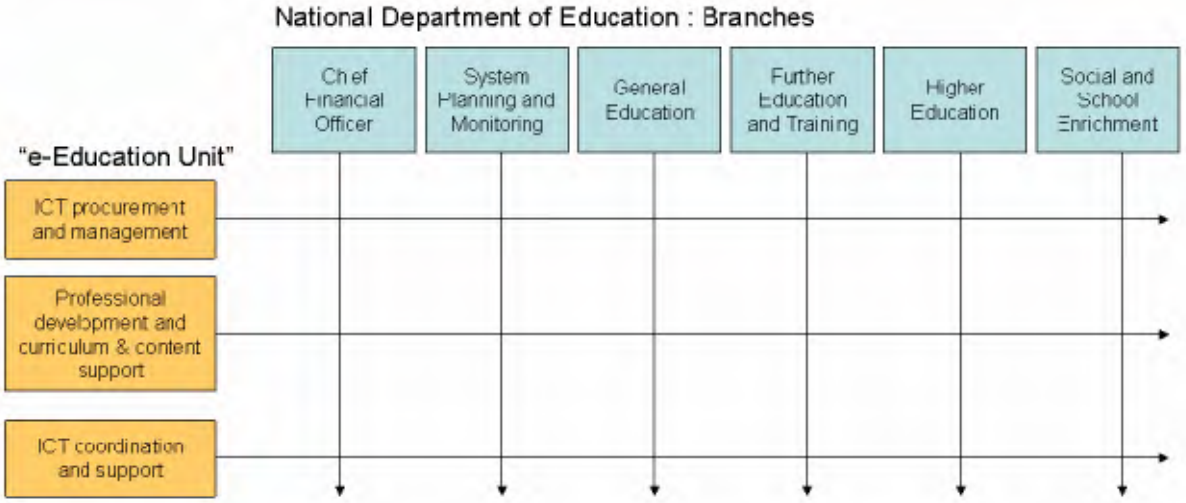
1) Manage the e-Education Initiative on behalf of the Institution, exercising delegated authority;
2) Ensure that the Initiative continues to be affordable and provides quality and value for money;
3) Ensure that all parties meet their contractual obligations and responsibilities;
4) Ensure that the requirements of the output specifications are achieved;
5) Appoint a management team with the skills necessary to manage, support, and administer the Initiative;
6) Build a strong partnership and good working relations with key stakeholders;
7) Prevent and/or resolve disputes;
8) Manage risks;
9) Monitor performance and achievements, and take corrective action where necessary;
10) Develop and implement a contract management plan;
11) Develop and maintain applicable administration systems;
12) Report on management of the Initiative, as required for, among others, the Institution's annual report, the Auditor-General, and any other government regulator;
13) Develop an effective communication framework; and
14) Develop and implement a change management plan.

8.2 National e-Education Unit

Considering the envisaged roles of this dedicated team outlined above, this unit would require the following additional personnel:

1) 1 Executive Manager (unit head) (at salary level 14).
2) 3 Senior Managers (at salary level 13):
   a) ICT procurement and management, including: implementing the applicable procurement strategy and liaison with the e-Unit in SITA in terms of ICT infrastructure and connectivity; e-credit management; and partnership management (including donor funding).
   b) Professional development, curriculum, and content support, including: General Education, Further Education and Training Schools, Further Education and Training Colleges and Social and School Enrichment; Thutong Portal management; and professional development programmes.
   c) ICT coordination and support, including: call centre management, research, evaluation and monitoring; provincial and district support; and programme management.
3) 25 Managers (salary level 12):
   a) 5 for ICT procurement and management, including:
      i) 2 Managers for implementing the applicable procurement strategy and liaison with the e-Unit in SITA in terms of ICT Infrastructure and connectivity;
      ii) 2 Managers for e-credit management; and
      iii) 1 Managers for partnership management (including donor funding);
   b) 8 for professional development, curriculum and content support, including:
      i) 3 Managers for General Education, Further Education and Training Schools, Further Education and Training Colleges and Social and School Enrichment;
      ii) 3 Managers for the Thutong Portal; and
      iii) 2 Managers for professional development programmes.
   c) 12 for ICT coordination and support, including:
      i) 3 Managers for research, evaluation and monitoring;
      ii) 5 Managers for provincial and district support;
      iii) 1 Manager for the call centre; and
      iv) 3 Managers for programme management office.
4) 15 Deputy Managers (salary level 10):
   a) 9 for ICT procurement and management;
   b) 6 for the Thutong Portal; and
5) 8 administrative and support personnel (salary level 5-7).

The new e-Education Unit will operate in a matrix structure with the existing structures of the Department as indicated below:



The e-Education Unit will focus on performing roles and responsibilities related to implementation of the e-Education Initiative, as stipulated in this document. This Unit will thus work in close collaboration with existing branches and line functions of the Department in order to ensure systemic integration of the Initiative. However, the dedicated team is responsible for driving and implementation of the e-Education Initiative.

8.2.1 Provincial e-Education Units

Considering the envisaged roles of these dedicated provincial teams, it is anticipated that they require the following additional personnel:

1) 1 Senior Manager (unit head) (at salary level 13)
2) 3 Managers (at salary level 13):
   a) ICT procurement and management, including: implementing the applicable procurement strategy and liaison with the e-Unit in SITA in terms of ICT Infrastructure and connectivity; e-credit management; and partnership management (including donor funding).
   b) Professional development, curriculum and content support, including: General Education, Further Education and Training Schools, Further Education and Training Colleges and Social and School Enrichment; Thutong Portal; and professional development programmes.
   c) ICT Coordination and support, including: research, evaluation and monitoring; provincial and district support; and programme management office.
3) 6 Deputy Managers (at salary level 10):
   a) 2 for ICT procurement and management;
   b) 2 for professional development, curriculum and content support;
   c) 2 for ICT coordination and support.
4) 3 administrative and support personnel (salary level 5-7).

The matrix structure as explained above will also apply to the Provincial Units.

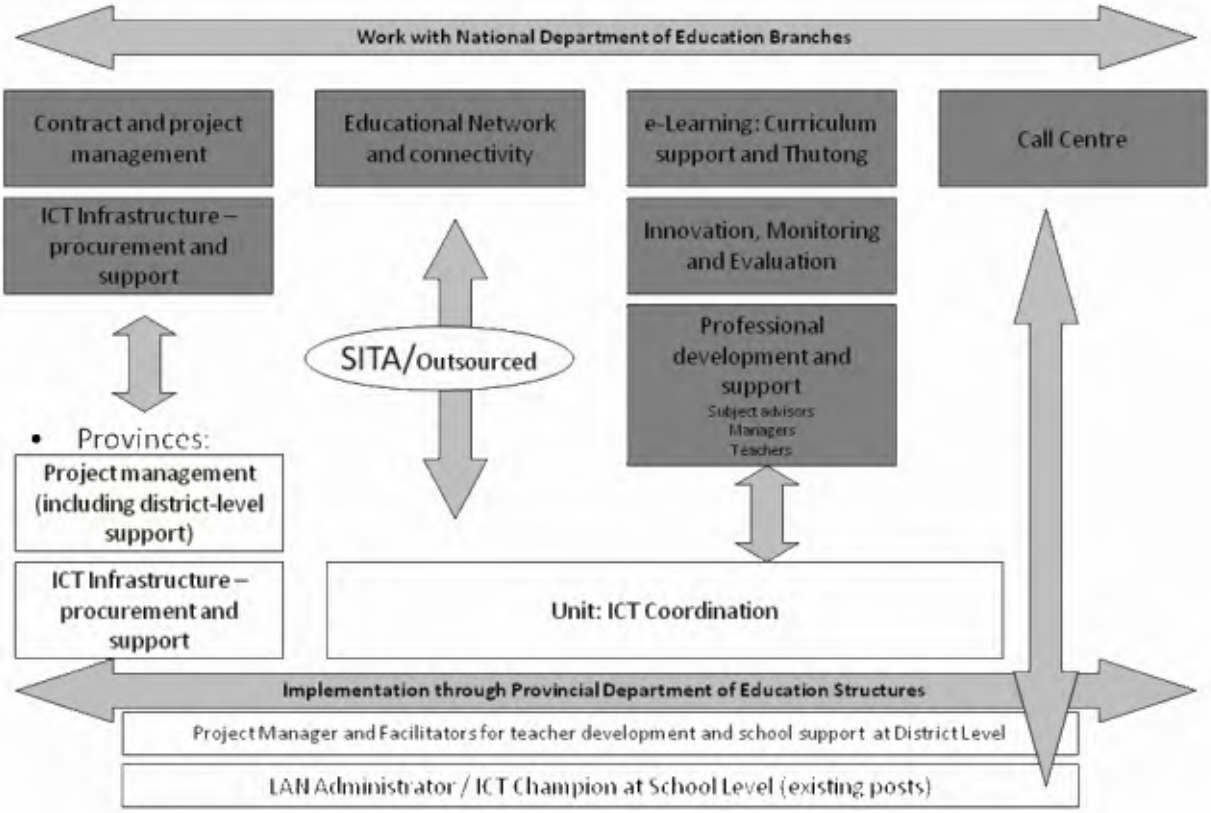
8.2.2 Districts

It has been recommended that districts play a central role in supporting schools and Colleges the adoption and integration of ICT across the curriculum areas. In supporting schools and Colleges, they will also play a key role in monitoring the implementation of their ICT Development Plans and their e-maturity levels. As such, the professional development Pillar of the e-Education Initiative includes both pull (e-PD credits for districts) and push (ICT leadership training and support for direct officials), to ensure that these personnel are equipped to play this monitoring and support role.

For national planning purposes, a typical district has been assumed to support 200 schools. The draft *Post Provisioning Norms for Districts* of January 2008 outlines that there are approximately 90 district level staff members who will work in the curriculum support services. These curriculum area staff will require support in their role in supporting schools to integrate ICT across the curriculum.

The capacity requirements and roles of Districts have been described in the individual Pillar descriptions above, so are not repeated here.

The overall structure of the e-Education Unit can thus presented above can be represented graphically as follows:



9 Change Management

9.1 Introduction

The e-Education Initiative represents a major opportunity to transform the way in which the education sector functions. It may either see ICT added as an additional 'project' requiring its own bureaucracy and adding onto an already overloaded system, or it may strive to use ICT to change the way in which Departments of Education, schools, and FET Colleges work to make their functions more efficient and cost-effective. To achieve the latter, however, a systematic process of change management is required at all levels of the system, led by senior management within the Departments of Education. This section outlines some of the main principles of effective change management strategies, and presents recommended change management processes and communication strategies which would support such transformation.

9.2 Effective Change Management

Organizations exist in a dynamic environment that is prone to change as a result of the impact of a variety of 'triggers', such as new technologies. In order to survive and be effective within a turbulent environment, organizations need to be able to transform in response to changes triggered both internally and externally. Apart from the organization as a whole, such changes have an impact on individuals within the organization. Effective change management involves understanding the potential effects that the change may have on individuals within the organization, and understanding and managing possible attempts to resist change.[24]

Change management entails use of a structured approach to assist individual people, teams, and organizations to move from a current state to a desired future state. It involves a shift in people's behaviour and attitudes to embrace changes.[25] It uses processes and tools to manage people during change at the organizational level. Tools are used in a structured approach to help people through the change process, to ensure effective transformation within the organization. People confronted by organizational change often experience a sense of 'culture shock', as established patterns to which they are accustomed and with which they are comfortable are altered, leaving many of them feeling threatened and experiencing a sense of loss or 'grief'.[26]

It is the responsibility of management to identify trends in macro- and micro-environments in order to detect changes and put programmes in place to deal with these. The possible impact that change will have on people's work processes, behaviour patterns, technological requirements, and motivation levels need to be identified. It is critical to determine people's likely reaction to change and institute a change programme to support them in going through and accepting the transformation of their work environment. The change programme is

[24] Wikipedia. http://en.wikipedia.org/wiki/Change_management_%28people%29. Accessed 22 April 2008.
[25] Ibid.
[26] Stuart. 1995. In Wikipedia, http://en.wikipedia.org/wiki/Change_management_%28people%29. Accessed 22 April, 2008.

disseminated throughout the organization, implemented, monitored for effectiveness, and adjusted if necessary.[27]

Key principles for effective change management are to:

1) Involve people in the organization at all times and agree on support required;
2) Identify where the organization is at that moment;
3) Identify where the organization wants to/should be, why, by when, and what measures will be needed to get there;
4) Plan the transition towards point 3, in stages that are appropriate, achievable and measurable; and
5) Communicate, involve, enable and facilitate the involvement of people from the outset and as openly and fully as possible.[28]

Jones, Aguirre and Calderone (2004)[29] suggested a 'Top 10' list of guiding principles for change management to be used by company executives as a systematic, comprehensive framework:

1) *The 'human side' needs to be addressed systematically*. Rather than dealing with issues on a case-by-case basis, a formal approach for managing change needs to be developed early in the process, and adapted as the initiative progresses. Change management should be integrated fully into the design of the initiative and decision-making, and feed into strategic direction.
2) *Start at the top*. When unsettling change is on the horizon, people look to the CEO/Head of Department and the leadership team for direction and support. Leadership must be first to embrace new approaches and motivate other role-players.
3) *Involve every layer*. Change efforts must involve plans to identify leaders at all levels of the organization/system who are responsible for design and implementation throughout their sector, in order that change 'cascades' throughout the organization. Leaders must be trained and aligned to the change vision, equipped to execute their role, and motivated to instigate change.
4) *Make a formal case*. Individuals will look to leadership for questions they have on the pending transformation, so it is important to articulate the case for change and create a written vision statement. The message will need to be customized for various internal audiences, addressing their concerns in a way to which they can relate.
5) *Create ownership*. The leadership will need to 'over-perform' during transformation to create an environment in favour of change. This entails ownership by leaders who are willing to accept responsibility for ensuring change happens in the areas under their influence.
6) *Communicate the message*. In good change programmes, the core messages are reinforced regularly and in a timely manner, in a way that is practicable and inspirational. Employees are provided with the right information at the right time, and their input and feedback is solicited. This may require over-communication through multiple channels.
7) *Assess the cultural landscape*. As successful change programmes cascade down, they gain momentum and intensity, making it critical that leaders understand and account for culture and behaviour at each level. Culture should be thoroughly assessed as it belies the

[27] Wikipedia. http://en.wikipedia.org/wiki/Change_management_%28people%29. Accessed 22 April 2008.
[28] Businessballs.com. http://www.businessballs.com/changemanagement.htm. Accessed 22 April 2008.
[29] Jones, J., Aguirre D., and Calderone, M. 2004. '10 Principles of Change Management', in strategy+business, http://www.strategy-business.com/resilience/rr00006?pg=all. Accessed 22 April 2008.

core values, beliefs, behaviours, and perceptions that need to be taken into account for successful transformation to occur.

8) *Address culture explicitly.* The culture needs to be addressed thoroughly once it is understood. Leaders will need to explicitly identify the culture and underlying behaviours that will support instituted changes and model and reward these behaviours. They will need to define the desired end-state or culture, and put together detailed plans to achieve this transition.
9) *Prepare for the unexpected.* No organizational transformation goes totally to plan. To manage change effectively, impact of the change must be assessed continually, as well as the organization's willingness to adopt the next stage of change.
10) *Speak to the individual.* Team leaders need to be honest and explicit in addressing concerns of individuals, who will need to know how their work will change, what will be expected of them during and after transformation, how they will be assessed and what success or failure will mean for them. Rewards for embracing change and sanctions for standing in the way of change should be used.

9.3 Change Management in ICT

Change management in ICT involves all role-players embracing ICT and using it to transform the way that the system in which they operate functions, so that it is more cost-effective and better able to equip educators and departmental officials to carry out their professional roles and so prepare learners for life and further study. ICT is a catalyst for change in the functioning of the education system. All role-players become engaged in processes that support them in changing the way in which they work and interact, in an effort to use ICT effectively in support of their roles. This may involve, for instance, support for ICT champions and role models, support for using local languages in ICT, demonstration projects to show potential for integrating ICT in education, and similar strategies.[30] Role-players will need support for a wide range changes involving ICT integration, such as:

- Department support staff communicating with each other and school/FET college management teams via e-mail instead of via letters, gazettes, and official circulars.
- Departmental and educator vacancies being advertised electronically and distributed via e-mail, enabling a transparent job application process. Applications might also be submitted electronically.
- School and FET College management teams using EMIS data to manage school record keeping, staff appointments, and management functions, as well as to report on their school status.
- Educators accessing curriculum documents and other supportive educational content on the Internet, reducing their preparation time and improving the quality of their teaching.
- Educators participating in communities of practice to make electronic contact with a community of educators and access professional development opportunities that encourage and sustain collegial support.
- Parents being notified by e-mail or SMS if their child is absent from school, is ill, or is involved in disciplinary action.

Implementation of the e-Education Initiative will affect the entire education sector and lead to fundamental changes to the ways in which it operates. This will impact on the functioning of

[30] NEPAD e-Africa Commission. 2008. NEPAD e-Schools Initiative, pp99-155.

the Departments of Education – at national, provincial, and district level – as well as at the school and College level. The aim is to ensure that ICT is integrated into the sector in a manner that sustains processes of systemic transformation. As established conventions and cultures will be challenged directly, implementation of the e-Education Initiative will need to be managed carefully. It will need to be supported with a series of change management interventions, and it is strongly recommended that these be incorporated into every aspect of ICT rollout to ensure that the e-Education Initiative is embraced and its objectives driven by all role-players. All Branches of the Department of Education at both national and provincial levels will need to be targeted with interventions to raise awareness and plan change management interventions. Moreover, all professional development must incorporate an element of change management.

The change management process involves development of a change management strategy and engagement process with all relevant branches within the national and provincial Departments of Education. This will involve developing standardized communication and capacity-building materials, conducting orientation and stakeholder consultation sessions, and follow-up mentoring, communication, and feedback sessions.

Interventions targeting the national Department of Education could include, but should not be limited to:

- Integrating e-Education Initiative ICT indicators into the whole-school evaluation process.
- Ensuring that e-Education Initiative monitoring indicators are included in the system's evaluation framework.
- Identifying ways in which learners with barriers to learning can be supported using ICT, and defining ways in which e-Education supports mechanisms within the current inclusive education framework.
- Integrating and aligning the objectives of professional development for school management and governance with the e-Education Initiative opportunities. An example would be defining the ways in which Thutong online communities of practice for school governing bodies (SGBs) are managed and used.
- Engaging provincial Departments of Education in a review of support structures at district level and roles of the districts in supporting development and implementation of ICT Development Plans for schools and FET Colleges.
- Reviewing the current scope of work and designing professional development interventions to harness ICT in managing the work of Departmental officials.
- Identifying areas in the scope of work of Departmental officials where the objectives of the e-Education Initiative need changes in their professional practice.
- Identifying areas in the scope of work of school and college managers, administrators, and educators where the objectives of the e-Education Initiative need changes in their professional practice.
- Defining mechanisms to support and monitor implementation of such changes within the relevant directorates.

Change management interventions at the provincial Departments of Education level should target relevant directorates with general awareness-raising, change management planning, and interventions, followed by interventions in specialist support areas.

Interventions at the school and FET College level would involve general awareness-raising, plus interventions that support effective use of ICT to support management and administration, communication, access to information, and teaching and learning.

9.4 Communications Strategy

Successful implementation of the e-Education Initiative will depend to a significant extent on winning the support of all role-players in the education system. Critical to this will be an effective communication strategy, which fully informs all role-players and allows them to participate in and influence the process. Such a strategy could include the following:

1) Full details of the e-Education Initiative are communicated to managers, administrators, and educators, who are actively encouraged to find ways to support their objectives. This could entail:
   a) Stakeholder interviews, workshops, and dialogue sessions on potential barriers to the effective implementation of ICT and brainstorming suggestions for overcoming these;
   b) Capacity-building materials relating to the e-Education Initiative;
   c) Professional development options, all of which should incorporate ICT integration;
   d) Press conferences, press releases, speeches, involvement of the media, and use of a variety of technologies such as cellular telephones, to publicize progress of the Initiative and to illustrate this with success stories;
   e) National and regional conferences, road-shows, workshop sessions, and so on.
2) Department officials, school management, administrators, educators, and parents are able to access regular electronic information updates that support them in their roles.
3) Department officials, school management, administrators, educators, and parents all use ICT to communicate with each other.
4) Department officials who are responsible for communication and capacity building use electronic media and regularly articulate messages that are effective and align with the e-Education Initiative strategy.
5) Stakeholders who are involved in integrating ICT into schools and FET colleges – such as Department officials, school and FET college management, educators and professional development institutions – engage in constructive and regular dialogue with one another. Opportunities for facilitating this dialogue may include:
   a) Media events, at which feedback is also solicited;
   b) Community forums or feedback sessions;
   c) The publication of monitoring, evaluation and research findings;
   d) Discussion forums;
   e) Public debates and debates in the media;
   f) Conferences;
   g) Calls for public comment;
   h) Workshops.

   These opportunities are used to inform and influence future policy, as well as strategic and implementation directions.
6) A growing network of stakeholders in the e-Education Initiative receive regular reports on the policy commitments, progress with regard to achieving these, ideas and resources. All role-players are able to engage with the process and help shape its direction.

9.5 Resourcing Implications

Change management is a process which must be driven by the senior management of the Department of Education. It will draw on the expertise of the dedicated unit within the e-Education Unit, but in order to be effective should be driven by the leadership of the Department of Education and the Ministry of Education.

For the purposes of the e-Education Initiative, there are already several detailed strategies proposed under all of the relevant pillars – but particularly professional development, curriculum and content, research, monitoring, and evaluation, and HR systems. Consequently, the purpose of outlining the above is not to propose additional outputs, activities, or investments, but rather to reinforce the message that all relevant activities will need to be imbued with the above change management principles. These may be used to support change management processes, however the change management drive is broader than professional development as it is at the heart of the way in which the Department of Education functions, and pertains to how ICT may be effectively used to attain the Departmental objectives. If it is an adjunct to existing management practices, it is unlikely to be successful.

As such, a dedicated change management strategy will need to target senior management of the Ministry of Education, the national Department of Education and provincial Departments. A structured and facilitated process of supporting these leaders to identify the opportunities created by the implementation of the e-Education Initiative to support their scope of work is required. Once senior managers are capacitated, they should be provided with the requisite budget and support to drive their directorates through their change management process and to support this drive with their communication strategy.

As such the resourcing implications have been split into:
- Budgets required for facilitation of high-level leadership engagement on planning a change management strategy; and
- Budgets required to support departmental implementation of change management processes and related communication strategies.

9.5.1 High Level Leadership Engagement

It assumed that a series of facilitation and support sessions is required for departmental leadership to be able to prioritize the change management process required in their Branch and/or Directorate. For this to be effective, engagements and support processes with each of the following are required:
- Top leadership in the Ministry of Education and national Department of Education;
- Senior management for each of the Branches of the national Department of Education;
- Top leadership of the provincial Departments of Education;
- Senior management for each Branch and/or Directorate of the provincial Departments of Education.

Such engagement is assumed to comprise of a combination of communication, meeting and interview engagements, workshop sessions on planning the resulting change management processes, and ad hoc mentoring and support on possible change management and communication strategies.

This engagement is expected to be supported by the e-Education Unit, but supported by expert facilitators, leadership coaches or mentors, and communication personal as required. Each series of engagements is expected to take place over a six-month period. Following this planning and leadership capacity process, each Directorate will implement its change management strategy over a two- to three-year period.

9.5.2 Departmental Implementation of Change Management Processes and Related Communication Strategies

It is assumed that, through the above processes, each directorate in the Departments of Education at national and provincial level will implement a change management strategy to harness effective use of ICT to their professional roles. In so doing, they need to be able to draw on a change management budget which will be administered by e-Education Unit of the national Department of Education.

These budgets will be required for the first five years of operation, and should be allocated to fund the following types of activities:

- Communication strategy layout, design, and e-Education branding for the e-Education Initiative;
- Development of materials, newsletters, newsletters, articles, posters, press releases, and so on;
- Convening of workshops, meetings, and teleconferences to share experiences and monitor implementation of change management strategies;
- Travel and accommodation for change management processes; and
- Procurement of expert change-management facilitation, leadership, or coaching services to support planned change management processes.