ICT Strategic Plan

Date Approved	Version	Resolution Number
30 June 2016	1	10.3.2
28 July 2017	2	019/OCM/17
26 May 2021	3	022/SCM/21
30 May 2023	4	
15 May 2024	5	041/SCM/24

The Information Communications Technology Manager

Senqu Local Municipality

19 Murray Street

Lady Grey

Telephone (051) 603 1300

Facsimile (051) 603 0445

Website: www.senqu.gov.za

Resolution: XXXXXX   Approved: XXXXXXXXXXXX

Preface

The first version of the Information Communication Technology Strategic Planning (ICT Strategic Plan) document, approved 30 June 2016, was compiled by PricewaterhouseCoopers (PwC). Changes to portions of this document have been made since but some portions of the document may still be as originally compiled by PwC.

The ICT Strategic Plan for Senqu local Municipality was changed to align with environmental changes, political influence, requirements from stakeholders and the COBIT 5 framework for the governance of enterprise ICT as developed by ICASA.

The contents of the report are specific to Senqu Municipality and will be used by management for Strategic Planning purposes.

Table of Contents

1. Introduction

In the modern business world ICT has become a strategic imperative without which organisations cannot survive. Due to this and other factors, ICT strategic planning has become critical for every organisation.

Senqu Municipality has recognised this fact and embarked on a project to develop an ICT Strategy. The ICT Strategic Plan for Senqu Municipality was developed in conjunction with key stakeholders from within the municipality.

The Municipality strives to make the best use of Information and Technology and therefore subscribes to the COBIT 5 Best Practice Framework for the governance of enterprise ICT as developed by ISACA.

The 5 underlying principles of this framework are:
- Meeting Stakeholder Needs;
- Covering the enterprise end to end;
- Applying a single integrated framework;
- Enabling a holistic approach and
- Separating Governance from Management.

Identifying and controlling ICT Projects;
Ensuring business value is realised from all ICT Investments;
Managing and Mitigating against ICT Risk
Compliance with increasing applicable legislation and regulation

2. *Scope and Approach*
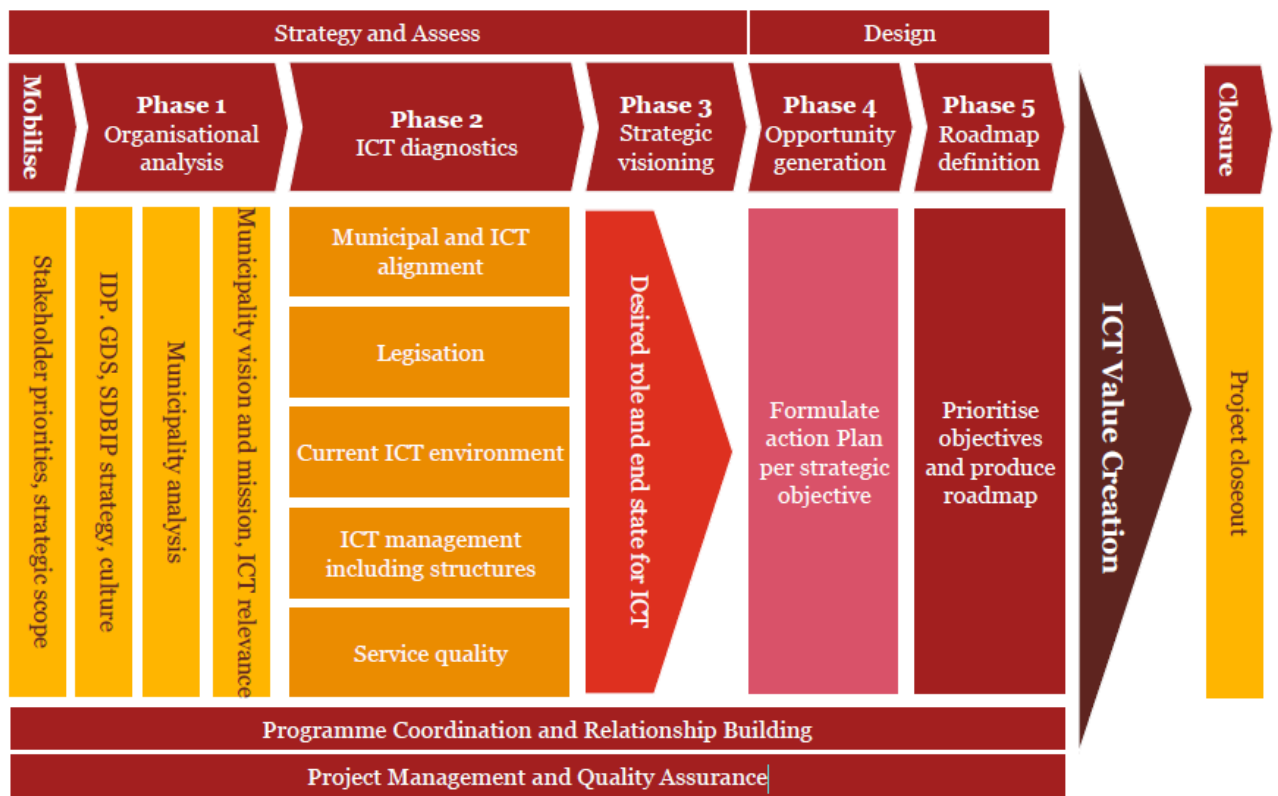
The methodology that was used to develop the ICT Strategic Plan for Senqu Municipality is illustrated below and an overview is given for each of the focus areas in the text that follows.

2.1. Phase 1 – Organisational Analysis

During this phase various documents were reviewed to understand the strategic intent of the Municipality as well as the ICT drivers for this project. This included the IDP which was used to understand what Senqu Municipality's future plans are in terms of strategic objectives. User suggestions, ICT Steering Committee resolutions, Top Management Meeting resolutions as well as inputs and suggestions from the Finance Standing Committee Meeting were considered as input during this phase. This was viewed in the light of the vision, mission and strategic objectives of Senqu Municipality.

2.2. Phase 2 – ICT Diagnostics

In order to gain an understanding of the business status quo, the following was considered:

a. ICT organisation structure
b. ICT infrastructure environment including the ICT facilities
c. Information systems environment including owners and users for these
d. Information flows for critical services
e. ICT performance and ICT risk
f. Level of integration / interoperability between the information systems

In addition, the views of key stakeholders were obtained to determine how ICT is or can aid them in their day-to-day operations.

Figure 1: ICT Organisation Structure

```
┌────────────────────────────────────────────────────────────────────┐
│          DIVISION INFORMATION COMMUNICATION TECHNOLOGY                │
│                                                                        │
│          MANAGER: INFORMATION COMMUNICATION TECHNOLOGY                 │
│                                                                        │
│                  X1                          FIN9                      │
└────────────────────────────────────────────────────────────────────┘
         │                                          │
┌─────────────────────────┐          ┌─────────────────────────┐
│   ICT SYSTEMS OFFICER    │          │   ICT NETWORK OFFICER    │
│                          │          │                          │
│     X1        FIN(X)     │          │     X1        FIN(Y)     │
└─────────────────────────┘          └─────────────────────────┘
         │                                          │
┌─────────────────────────┐          ┌─────────────────────────┐
│  ICT SYSTEMS TECHNICIAN  │          │  ICT NETWORK TECHNICIAN  │
│                          │          │                          │
│     X1        FIN10      │          │     X1        FIN12      │
└─────────────────────────┘          └─────────────────────────┘
```
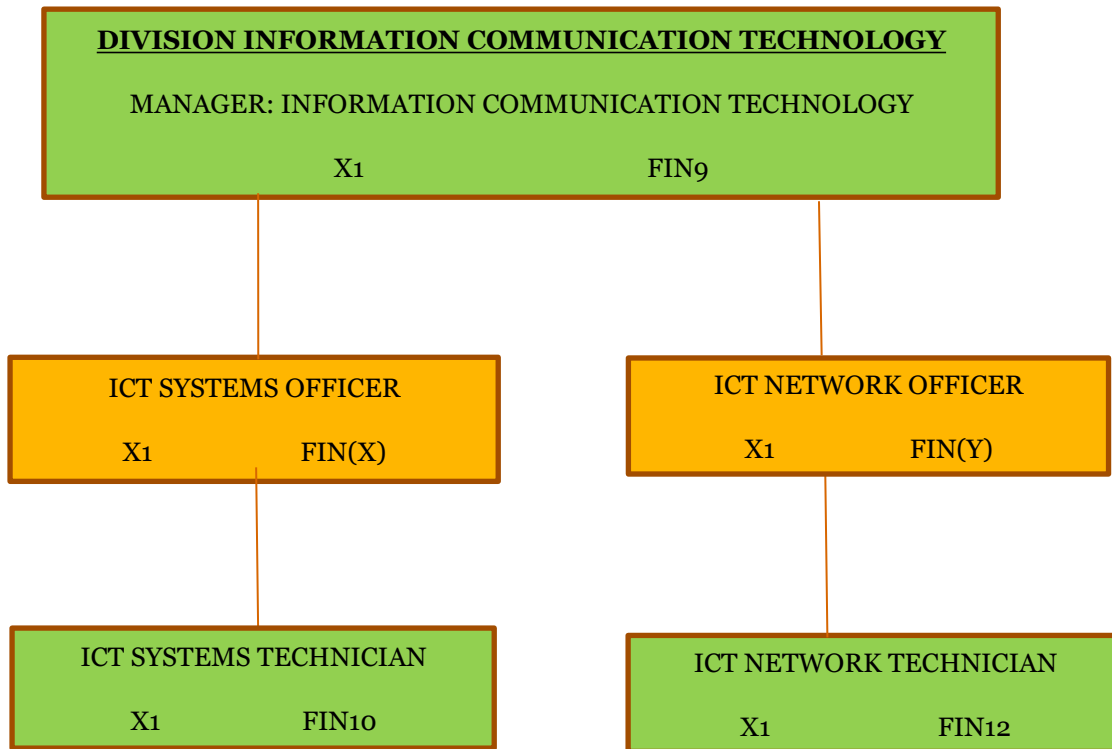
Where:

| Funded filled post |
| Unfunded New (Critical X, Y) |

2.3. Phase 3 – Strategic Visioning

During this phase key stakeholders were engaged to identify opportunities for improvement and a desired target state to ensure that the way forward being defined is workable for Senqu Municipality taking into account the strategic objectives for the short and long term.

2.4. Phase 4 – Opportunity Generation

The results of the previous phases were used as a basis to establish opportunities for an improved ICT service that would effectively and efficiently support the organisational processes of the municipality. These improvements were to be identified for each of the following:

a. Strategy - what organisational and ICT strategies should be in place to effectively support the organisation, and how will the organisation exercise control over ICT?
b. Processes - how should resources be organised, monitored, and controlled to deliver ICT services and development projects within the organisation?
c. Technology – which technology trends can be exploited to improve the effectiveness of the technology architecture and how technology is deployed within the organisation?

d. People - how will ICT human resources be managed; how should the ICT Department be structured to meet the current and future needs of the business?
e. Systems - what application systems can be identified to address deficiencies that currently exist in the information and functionality provided by systems?

ICT research (trends, directions, etc), review of industry sector benchmarks and interviews with senior management were conducted to identify opportunities for improvement.

2.5. Phase 5 – Road map Definition

During this phase, ICT projects were phased and prioritised over a five-year period to produce a realistic ICT roadmap. In addition, the results from previous phases were evaluated to ensure that the way forward is workable for Senqu Municipality, taking into account the strategic objectives for the short and long term.

This last phase is the culmination of the work performed during the previous phases and will outline the ICT Strategic Plan for Senqu Municipality for the short to long term (3 to 5 years). This report will define a set of ICT initiatives which need to be undertaken via sub projects to implement the ICT Strategic Plan within the organisation.

3.   *Key sources of information*

The following are the key sources of information that were utilised for completion of this deliverable:

    a. Interviews with key stakeholders within Senqu Municipality.
    b. PwC benchmarking tools and other knowledge sources.
    c. Gartner research material.
    d. National SALGA ICT Capacity Maturity Assessment
    e. Provincial Cogta Municipality Assessment

4.   *Senqu Municipality Vision, Mission and Values*

As part of our review and information gathering, we also reviewed the strategic objectives, vision and mission statements of Senqu Municipality for the ICT Strategic Plan. The following was noted from Senqu Municipality's Integrated Development Plan:

Vision

"A unified, people-centred, developmental and vibrant municipality"

Mission

In pursuit to achieve its vision, Senqu Municipality will strive to:

- Promote a culture of good governance,
- Promote a culture of performance excellence,
- Develop and maintain appropriate and economic infrastructure,
- Develop and retain human capital,
- Adopt a zero-tolerance against corruption,
- Promote a conducive environment to stimulate economic development,
- Implement appropriate financial management systems to ensure the continued growth and viability of the Municipality,
- Ensure regular and scheduled public interaction with communities to enhance accountability and people-centred planning,
- Provide basic service delivery needs to communities in an equitable manner,
- Encourage the maintenance of a safe and healthy environment.

Values

To achieve its mission, Senqu Municipality embraces the following values:

- People first (Batho Pele)
- Integrity and honesty
- Transparency and fairness
- Accountability
- Excellence
- Humility
- Respect and tolerance for cultural diversity
- Discipline

Senqu Municipality values and how they relate to the ICT Strategic Plan

It is essential that the ICT Strategic Plan and projects supports the business strategy.

When coming up with the projects suggested in this ICT Strategic Plan, we have mapped them back to the values of Senqu Municipality. Detailed initiatives showing how we have addressed these are discussed later on in the document.

Ref	Senqu Municipality Values	Extent to Which Addressed
1	Good Governance	√
2	Accountability	√
3	Public Participation	√
4	People Development	√
5	Teamwork	√
6	Integrity	√
7	Tolerance	√
8	Honesty	√
9	Responsibility	√
10	Trust	√

Key:

X   **Not addressed/ not relevant to ICT**
3   **Fully addressed**
√   **Partially addressed**

5.   *Executive Summary*

1.1.   Objectives

The purpose of this ICT Strategic Plan is to align Senqu Municipality's ICT planning, investment decisions and management with its business requirements. The development of the ICT Strategic Plan required an understanding of the current environment, creation of an appropriate vision and an assessment of different strategies for achieving this vision.

It is critical to understand the strategic planning process as it forms the link between the business needs and the use of ICT to meet those needs. The Integrated Development Plan should drive the identification of new system(s) (or enhancements to current systems). The technology infrastructure must facilitate new or existing business processes, as well as new systems that can be rapidly deployed to deliver new products and services. The overall goals of effective ICT operations are to reduce time and cost, improve quality, enhance customer satisfaction, and increase the value added by ICT.

1.2.   Results of ICT Diagnostic Phase

It is clear from the initial assessment that a number of issues at various levels of impact exist within Senqu Municipality that are preventing the municipality from realising the maximum benefit from its ICT systems and resources.

During the assessment it was noted that the contributing factors to this was that numerous manual business processes exist within the Municipality.

1.3.   Recommended Way Forward

We have obtained an understanding of Senqu Municipality's objectives and issues from liaising with the different business units in order to complete the ICT Strategic Plan and the recommended way forward is based on this understanding. Following our assessment of the issues highlighted during the development of the ICT Strategic Plan for Senqu Municipality, we propose the following:

1. A skills review for ICT staff should be performed and ICT staff should receive training where gaps are identified based on their job responsibilities. Training should be provided on a regular basis such that ICT staff skills are kept up to date.

2. The Municipality should perform an evaluation of the network in order to determine the Municipality's bandwidth requirements. The Municipality should consult with telecommunications providers and use historical data to determine future connectivity requirements. Once the evaluation is complete, the Municipality should consider upgrading the network.

3. There are a number of business processes that are performed manually by staff at the Municipality. The Municipality should consider automating the following business processes:

    a. Supply Chain Management
    b. Asset Management
    c. Contract Management
    d. Risk and Compliance Management
    e. Employee Self Service
    f. Inventory Management

g. Internal and External Customer Care Management
h. Revenue Management
i. Electronic Documents and Records Management
j. Circuit Camera Television Management
k. ICT Helpdesk Management
l. Biometrics Clocking and Security Management
m. Infrastructure and Maintenance Management
n. Performance Management

Senqu Municipality should consider using an enterprise resource management to automate the above business processes.

4. A refresh cycle for computers, servers and networking infrastructure needs to be established by Senqu Municipality.

5. An ICT Business Continuity Plan (BCP) should be developed by Senior Executive Management and approved by Council to cater for changes to Business landscape. The BCP and Disaster Recovery Plan (DRP) should be tested, updated and aligned on an annual basis.

6. The Municipality should consider upgrading the server rooms such that adequate physical security and environmental controls are in place.

6.   *Issues arising from the ICT Diagnostic phase*

During this phase interviews were conducted with management to understand the business and reports from various key resources of information mention in 3. Based on our discussions with key stakeholders the following points were highlighted as issues that are related to ICT. These points came out of the interviews with staff members.

The issues are categorised into Financial, Operational and ICT issues.

1.4.   **Information Communication Technology (ICT)**

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation
1	ICT Equipment and Refreshment Cycle	• Unplanned and disorderly replacement of equipment can lead to unauthorised expenditure or alternately to users not having the tools of trade to do their work. • The age of computers and their peripheral devices varies between 1 - 7 years. • The age of servers and network infrastructure varies between 1 - 7 years.	10.1
2	Appointments of ICT Systems Officer and ICT Network Officer	• Staff not coping with daily user support and general workload, causing them to compromise on monitoring systems and leaving more technically difficult work for the External ICT Support person to do. • Due to the size of End-Users and ICT Infrastructure growth/development • To ensure ICT section is equipped with a suitable critical skill required.	10.2
3	Business Continuity and Disaster Recovery	• The ICT Business Continuity Plan (BCP) does not exist and should be planned by Senior Executive Management (SEM). • The Disaster Recovery Site establishment • Disaster Recovery Plan which must be periodically tested.	10.3
4	Backup and Storage Facilities	• Backups may fail and servers may be damaged or experience unexpected failures due to unsuitable conditions of the environment in which equipment is kept. • The ICT section through the office of the CFO have identified Barkly East Administration building as DRP site. • Some users storing information on local hard drives and on portable drives of which there is planned solution that will encompass backing up of PC/Laptops to protect the individual departmental	10.4

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation
		information.	
		• Shared Network Filesystem Storage for individual end-users as all end-users must utilise the network drive to store institutional council information.	
		• Some systems are stand-alone and may not be backed up as they are sitting on the users' hard drives and offices. These systems may include:	
		o Asset Management	
		o Internal Audit	
		o Risk & Compliance Management	
		o Internal and External Customer Care Management	
		o Supply Chain Management	
		o Contract Management	
		o Inventory Management	
		o Revenue Management	
		o Infrastructure and Maintenance Management	
		o Biometric Clocking and Security Management	
		o Performance Management	
		o Electronic Documents and Records Management	
		o Circuit Cameras Television Security Management	
		o ICT Helpdesk	
		o Employee Self Service	
		• The systems large volume backups will only be scheduled to run overnight and over the weekends.	
		• Replication to the designated Barkly East Server room of the systems will be scheduled on weekly basis via cloud information copying technology.	
5	ICT Staff Trainings	• ICT staff are heavily reliant on service providers to resolve network and server infrastructure problems due to depleted ICT section organogram and shortage of specialist skills.	10.5
		• ICT staff have not received adequate training budget to keep skill levels up to date with the latest technology in terms of hardware, software, and applications.	
		• The lead time in resolving ICT issues is extensive and causes frustration within the Municipality.	

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation
6	Reduction of Printing Cost	• Most end users have their own printer and scanners in their offices. • Few users share a network Mono/Black and White printer in their working areas. • Assessment of individually installed, configured printers and scanners will be conducted • All peripheral devices such printers and scanners due for assets disposals will be transferred to our Asset Management team • Departments to provide costs associated with the current printing facilities to the ICT section for proper scientific assessment on bulk printing versus individual end-user's printing methodologies • ICT section will prepare an item for ICT Steering Committee which will make a relevant recommendation to SEM.	10.6
7	Social Media Platforms	• The full potential of social media has not been exploited as we are only using Facebook and Senqu Website • Many government institutions and NGOs are also using Twitter, Instagram, WhatsApp, Telegrams during this 4th Industrial Revolution Technology Era, hence it will be very critical to engage the institutional Communications Section for further council approved platforms to be used. • Then ICT Section will advise on the Systems and Infrastructure supporting these Social Media platforms requirements	10.7

8	Improve Physical Security and Environmental Controls	• The Municipality is exposed to the following environmental risks due to inadequate setup of the server room:
		  o The server room walls are insulated with polystyrene.
		  o The smoke detector is very basic. It sounds and alarm which may not be audible by the security guards in the security house about 50m away.
		  o The server room has 2 entrances protected by locked wooden doors and locked security gates which are accessed by lock and key.
		  o Temperature is monitored by a
			10.8

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation
		device which sends alarm to a cell phone if the room temperature exceeds a pre-set temperature. o The smoke detector is very basic. It sounds and alarm which may not be audible by the security guards in the security house about 50m away. o The floor is covered by carpets. o The server room does not have a raised floor. o There is no water detection system. o There is no fire suppression system. • Some cabinets containing Network Equipment are not lockable.	
9	Establishment of Super Users for System Owners	• ICT staff are heavily reliant on service providers to assist end user with ICT related problems.	10.9
10	Enterprise Resource Planning System MSCOA Compliant	• Sebata has a limit on the number of characters that can be entered when creating technical specifications for quotes or tenders. As a result, incorrect items are ordered and cannot be used.	10.10
11	Purchase and Installation of Archiving compliant Emails	• Outdated MS Exchange software is not compatible with new MS Office software	10.11
12	Installation of Lightning Protection like UPS	• Equipment is not earthed and this poses a threat of equipment being lost due to lightning.	10.12
13	Installation of Video Conferencing Facilities	• Lack of modern communication technology limits possibilities of video conferencing which could result in cost savings	10.13
14	Development of the VPN and Cloud Based Secured Technologies	• Constant attempted attacks make Cloud vulnerable	10.14
15	Internet Access Wi-Fi Hotspots for the Community	• Repeated requests from the community require the identification of Internet Nodes where members of the community can have free access to Internet.	10.15

1.5. Annual Tenders (ICT)

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation
16	Procurement ICT Equipment both hardware's and softwares licensing	• Purchase Various ICT Equipment for all Departments of Senqu Municipality	10.16
17	Procurement Network Equipment	• Purchase Network and Server Equipment	10.17

1.6. Three Year Contracts (ICT)

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation
18	ICT Network Maintenance and Server Support	• ICT Staff need professional assistance with server and network maintenance. Contract expires 30 June 2019.	10.18
19	VPN Line Rental (Network Connectivity & Bandwidth)	• Data line (Fixed Line) speeds are limited and as a result, ERP is problematic as it has to share bandwidth with existing operations such as email, internet and telephones and all of these will be affected and be slow or not work at all. • All office related operations (email, internet, network access, telephones and cameras) of Technical, DTPS and Community Services may come to an abrupt end if the Fibre Optic cable, currently running in the ceiling of the old age home building, is accidentally cut or damaged during building operations. • Operations (including telephones and cameras) of Fleet and Tourism Offices in Lady Grey may be affected by slow/unstable network connectivity.	10.19
20	Network Security Control Solution	• The contract for the provision of network, system and server security expires on 31 October 2022.	10.20
21	Antivirus Security Software Licenses	• *The contract for the current antivirus solution expires on 31 October 2022.*	*10.21*
22	Rental of Offsite Backup Premises	• Appointment of Offsite Backup Facility	10.22

1.7. Business Processes outside ICT Jurisdiction

Note: Business Processes fall under various Departments. Each Department is responsible for budgeting of automation of its own business processes. ICT has no authority and can only advise. When there is budget for the automation of a Business process, ICT can assist with Specifications, Installation, Monitoring and Backups. Where systems are not automated, ICT takes care of backups of all computers that are used to manage any particular Business Process and supports where possible. Although ICT is not responsible for Automating Business Processes, it has been included in the Strategic Plan for the sake of completeness and in order to make recommendations.

Ref	Process/Activity	Issues	Strategic ICT Initiative Recommendation

23	Automation of Business Processes	• The following processes are performed manually:
		  o Asset Management.
		  o Performance Management.
		  o Audit Management.
		  o Risk and Compliance Management.
		  o Supply Chain Management.
		  o Contract Management.
		  o Inventory Management.
		  o Records Management.
		• Employees are making use of manual forms to submit leave, in addition, Staff located at the Barkly East and Sterkspruit satellite offices have to drive to Lady Grey to submit leave forms.
		
		• The Records Management Policy does not cater for the electronic storage of records. In addition, records have been misplaced and are difficult to locate.
			10.23

24	Improvement to Time and Attendance System	• After some employees have scanned in using the biometric fingerprint reader, the time and attendance system records them as absent. Thereafter, HR has to confirm	10.24

		whether these employees were absent from work. • The Time and Attendance and Payroll systems are not interfaced. • The Time and Attendance System is one of the systems that is hosted on a user's computer.	
25	Customer Care and Helpdesk Management	• A hotline number exists which customers can use for account queries and fault reporting, however, details of calls received are recorded in MS Excel. • Some customers are bypassing the hotline number and are calling technicians directly to resolve faults. • The call log is stored on a user's local drive.	10.25
26	Infrastructure and Maintenance Management	• Infrastructure and maintenance management is a manual process. • Job cards are paper based.	10.26
27	Asset Management	• Asset management is a manual process where assets are scanned and recorded in MS Excel. The Master copy is on one person's computer which is backed up. Users who need information about assets are dependent on the person who as the master copy.	10.27
28	Hosted Systems	• Loss of access to systems and data due to hosting by external companies which may be prone to hackers, backups not being done and who have the power to hold the municipality at ransom.	10.28

2. *Implementation Roadmap*

The diagram below is a graphical representation of the ICT initiatives that need to be undertaken in order to address the issues mentioned above and the timelines for implementation:

Strategic ICT Initiative	2021		2022		2023		2024		2025	
ICT Equipment and Refreshment Cycle	■	■	■	■	■	■	■	■	■	■
Appointment of ICT Network Administrator	□	■	■	□	□	□	□	□	□	□
Business Continuity and Disaster Recovery	■	■	■	■	■	■	■	■	■	■
Backup and Storage Facilities	■	■	■	■	■	■	■	■	■	■
ICT Staff Training	□	■	□	■	□	■	□	■	□	■
Reduction of Printing Cost	■	■	■	■	■	■	■	■	■	■
Social Media	■	■	■	■	■	■	■	■	■	■
Improve Physical Security and Environmental Controls	■	■	■	■	□	□	■	■	□	□
Establishment of Super Users	□	□	■	□	■	□	■	□	■	□
Enterprise Resource Planning System	■	□	□	□	□	□	□	□	□	□
Purchase and Installation of Archiving Compliant Email	□	□	■	■	■	■	■	■	■	■

Installation of Lightning Protection										
Installation of Video Conferencing Facilities										
Development of the VPN and Cloud Based Secured Technologies										
Internet Access Nodes for the Community										
Procure ICT Equipment										
Procure Network Equipment										
ICT Network Maintenance and Server Support										
VPN Line Rental (Network Connectivity & Bandwidth)										
Network Security Control Solution (Replace and Increase Security Software Coverage – Firewall)										
Antivirus Software Licenses (Replace and Increase Antivirus Coverage)										
Rental of Offsite Backup Premises										
Automation of Business Processes	?	?	?	?	?	?	?	?	?	?
Improvement to Time and Attendance System	?	?	?	?	?	?	?	?	?	?
Customer Care and Helpdesk Management	?	?	?	?	?	?	?	?	?	?
Infrastructure and Maintenance Management	?	?	?	?	?	?	?	?	?	?
Asset Management	?	?	?	?	?	?	?	?	?	?
Hosting and Ransom	?	?	?	?	?	?	?	?	?	?

3. ICT System Landscape

The number of systems within the ICT environment should be kept to a minimum to reduce the Total Cost of Ownership. This greatly enhances the integrity of data, reduces time lost due to having to re-capture information or transfer information between systems. The most important feature would be that reporting within the municipality will be enhanced significantly.

The diagram overleaf is based on Senqu Municipality's current ICT system landscape and the recommendation as to what the future ICT system landscape should resemble in the next 5 years.
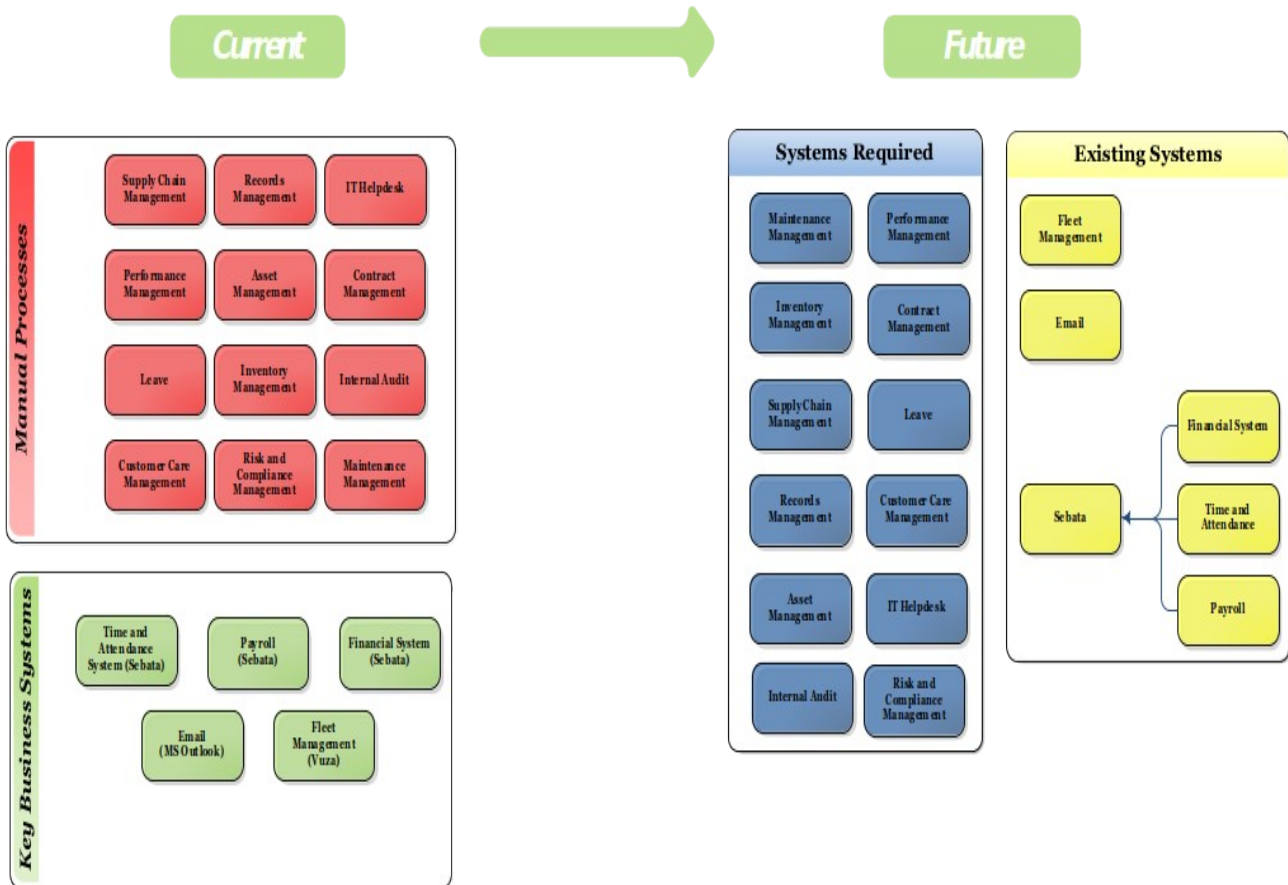
4. Research and Benchmarks

A number of sources were used when conducting research for Senqu Municipality's ICT Strategic Plan document. Some of the sources are as follows:

a. Interviews with Sebata.
b. Research material from Gartner.

The results from our research from the various knowledge sources were used to influence the Strategic Visioning and Opportunity Generation Phases of the ICT Strategy and will be used to demonstrate why we have taken specific decisions in the ICT Strategy document.

As stated above we have made use of Gartner research material in this report. This material is included in the report and is subject to the following:

All statements in this report attributable to Gartner represent PwC's interpretation of data, research opinion or viewpoints published as part of a syndicated subscription service by Gartner, Inc., and have not been reviewed by Gartner. Each Gartner publication speaks as of its original publication date (and not as of the date of this report). The opinions expressed in Gartner publications are not representations of fact, and are subject to change without notice.

Our interview with Sebata is summarised below:

a. Sebata FMS is still used at the Municipality.
b. The Municipality is in the process of implementing ERP (Enterprise Management System) which is mSCOA compliant.
c. The ERP will automate most of the manual processes at the Municipality, some examples include SCM, Asset Management, Inventory management and the Electronic Document Management System.
d. Sebata closely interacted with Senqu Municipality to discuss the business processes and workflows as part of the project plan.
e. Users are experiencing issues with FMS whereby transactional descriptions have a limited field length. Sebata has indicated that this issue will be resolved when ERP is installed.
f. There was a discussion about the use of hand held devices to be used in place of manual job cards for maintenance jobs. Sebata indicated that ERP can support the use of mobile devices which can interface with the system.

Gartner Hype Cycle

During this phase we also reviewed Gartner's Hype cycle for Digital Government and reviewed this in light of Senqu Municipality's current position and issues being experienced. Below is the hype cycle with a narrative explaining the cycle.

Hype Cycle for Digital Government, 2014

The diagram is what Gartner terms a 'hype cycle' and represents technology being implemented in Government (as at July 2014).

The hype cycle is a graphical representation of the maturity, implementation and business uses of specific technologies. The cycle is divided in 5 phases:

a. *Innovation Trigger:* A breakthrough, public demonstration, product launch or other event generates significant press and industry interest.

b. *Peak of Inflated Expectations:* During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leader's results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.

c. *Trough of Disillusionment:* Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.

d. *Slope of Enlightenment:* Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.

e. *Plateau of Productivity:* The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.

Applicable research from Gartner that is relevant to Senqu Municipality's ICT Strategic Plan is summarised below:

Applicable Gartner Research	Gartner Definition	Strategic Initiative Reference
Employee Use of Social Media in Government	Government employees can choose to use a combination of corporate and consumer social media to improve their effectiveness and efficiency by relying on and sharing internal and external knowledge. Unlike the enterprise use of social media, employees have a choice of the tools they use and the professional purposes they are pursuing.	10.9

5. *Strategic ICT Initiatives*

Based on the information gathered and research performed, the following strategic initiatives need to be implemented to assist Senqu Municipality in achieving their business objectives.

10.1	ICT Equipment and Refreshment Cycle
10.2	Appointment of an ICT Network Administrator
10.3	ICT Business Continuity and Disaster Recovery Plans
10.4	Backup and Storage Facilities
10.5	ICT Staff Trainings
10.6	Reduction of Printing Cost
10.7	Senqu Municipality Social Media Platforms
10.8	Improve Physical Security and Environmental Controls
10.9	Establishment of Super Users
10.10	Enterprise Resource Planning System
10.11	Purchase and Installation of Archiving Compliant Email
10.12	Installation of Lightning Protection
10.13	Installation of Video Conferencing Facilities
10.14	Development of the VPN and Cloud Based Secured Technologies
10.15	Internet Access Nodes for the Community
10.16	Procure ICT Equipment
10.17	Procure Network Equipment
10.18	ICT Network Maintenance and Server Support
10.19	VPN Line Rental (Network Connectivity and Bandwidth)
10.20	Network Security Control Solution (Replace and Increase Security Software Coverage – Firewall)
10.21	Antivirus Software Licenses (Replace and increase Antivirus Coverage)
10.22	Rental of Offsite Backup Premises
10.23	Automation of Business Processes
10.24	Improvement to Time and Attendance System
10.25	Customer Care and Helpdesk Management
10.26	Infrastructure and Maintenance Management
10.27	Asset Management
10.28	Hosting and Ransom

The diagram below depicts the inputs used to determine the strategic decisions:

Strategic ICT Initiatives
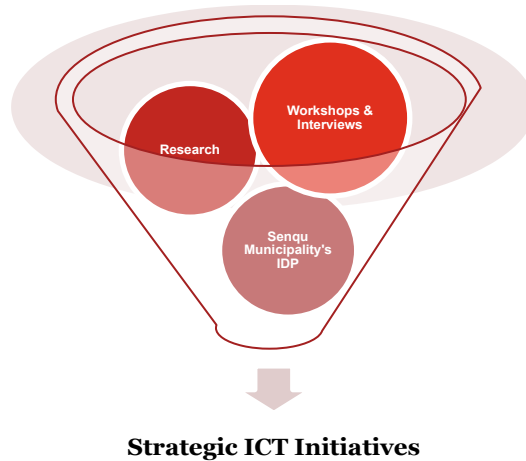
1.1. ICT Equipment and Refreshment Cycle

Timeframe: Cycle – Continuous
Operations and Maintenance Policy – 12 Months starting 1 July 2021

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Unplanned and disorderly replacement of equipment can lead to unauthorised expenditure or alternately to users not having the tools of trade to do their work.
- The age of computers varies between 1 - 8 years.
- The age of servers varies between 1 - 4 years.
- The age of network switches and Wi-Fi Access points vary between 1-4 years
- Business units are bypassing the ICT department when procuring ICT goods and services.

Approach:

Policy to Guide

An ICT Operations and Maintenance Policy should be developed to provide guidance with regard to:

1. Purchasing of all ICT related hardware and software for all business units and staff through the ICT department and approved by the ICT Steering Committee.
2. Communication of the process to all staff and business units within Senqu Municipality.
3. Inclusion of a section where the needs of the requesting business unit are considered.
4. The use of an asset register to identify all users with outdated computers.
5. Refreshment of the most outdated computers first.
6. Consideration of Networking Infrastructure in the refresh cycle.

Supporting Information:

Centralisation of ICT Purchases

Priorities are different for each business unit and as a result the age and specifications of computers varies from business unit to business unit. An equipment refresh cycles within Senqu Municipality can be established.

A formalised ICT procurement process within Senqu Municipality will yield the following benefits:

- Standardisation of all ICT equipment.
- Guarantees on ICT equipment.
- Discounts on bulk purchases of ICT equipment.

1.2. Appoint and ICT Network Administrator

Timeframe: 12 Months (Depending on availability of budget)

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

Staff not coping with daily user support and general workload, causing them to compromise on monitoring systems and leaving more technically difficult work for the External ICT Support person to do.

Approach:

- Filling the position of ICT Network Administrator will lighten the general workload and allow the other staff to get to the work they need to do.

Supporting Information:

None

1.3. ICT Business Continuity and Disaster Recovery

Note: ICT Business Continuity falls under all Senqu Municipality and ICT Disaster Recovery falls under Information Communication Technology. Although ICT is not responsible for Business Continuity, it has been included in the ICT Strategic Plan for the sake of completeness and in order to make recommendations.

Timeframe: Disaster Recovery - Periodically as per Implementation Roadmap.
Business Continuity – Depends on Corporate Services.

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- The ICT Business Continuity Plan (BCP) does not exist and should be done by Corporate Services.
- The Disaster Recovery Plan (DRP) is not periodically tested.

Approach:

Business Continuity

1. Senqu Municipality should develop and formalise an ICT Business Continuity Plan (BCP). This initiative should be driven out of business and responsibility should be assigned to a business committee or representative from the business.

2. Business impact assessments should be performed on all business systems and applications to ensure that the ICT team can recover critical business systems and applications based on business requirements and objectives.

3. The BCP should be approved by Council.

4. The BCP should be tested at least annually.

Disaster Recovery

5. While it is not practical or possible to test the Disaster Recovery Plan without causing major disruptions to the Business of the Municipality, real life incidents such as network failure, a server that stops working, no internet access etc. will be considered to be testing of the Disaster Recovery

Plan. Recovery must be documented and communicated to the ICT Steering Committee and Top Management. Documentation must include details about application and infrastructure restores and back-up restores to ensure that these plans will function as and when required.

6. The current DRP should be aligned to the BCP once it is formalised.

Supporting Information

[ICT Business Continuity Plan](#) **(BCP)**

[Business Continuity Planning](#) is important as it allows Senqu Municipality to prepare for and aid in a disaster recovery. It is an arrangement agreed upon in advance by management and key personnel of the steps that will be taken to help the Municipality recover should any type of disaster occur. These programs prepare for multiple problems. Detailed plans are created that clearly outline the actions that an organisation or particular members of an organisation will take to help recover any of its critical operations that may have been either completely or partially interrupted.

ICT Disaster Recovery Plan (DRP):

Senqu Municipality will use this process to recover access to their software, data, and/or hardware that are needed to resume the performance of normal, critical business functions after the event of either a natural disaster or a disaster caused by humans. Disaster Recovery plans are often focused on bridging the gap where data, software, or hardware have been damaged or lost, it is also important to plan for the unexpected loss of key personnel.

1.4. Backup and Storage Facilities

Timeframe: Continuous as per Implementation Roadmap

Senqu Municipality Values

- Good governance
- Integrity

Discussion points highlighted by Management:

- Backups may fail and servers may be damaged or experience unexpected failures due to unsuitable conditions of the environment in which equipment is kept.
- The existing small inverter at offsite backup is not sensitive enough to switch over during minor power fluctuations which affect the NAS hence a second server room is being constructed in one of the towns of the municipality.
- Some users storing information on local hard drives and on portable drives.
- Some end users are not utilising the network drive to store information.
- Some systems are stand-alone and may not be backed up as they are sitting on the users' hard drives. These systems may include:
    - Asset Management
    - Internal Audit
    - Risk & Compliance Management
    - Revenue Management
    - Supply Chain Management
    - Contract Management
    - Inventory Management
    - Electronic Documents and Records Management
    - Performance Management
    - Biometrics Clocking and Security Management
    - Customer Care and Helpdesk Management
    - Infrastructure and Maintenance Management
    - Cloud Computing System
    - Wireless Connectivity System
    - Communications Systems
- The large volume of backups cause overlaps and failures

Approach:

1. Purchase and install the server rack and panels in which the equipment can be housed properly in the Offsite backup room.
2. Purchase and install a more sensitive inverter for offsite backup.
3. Identify the critical workstations and verify monthly that the hard drives are backed up.
4. Purchase and install smaller NAS/SAN devices which would allow for simultaneous running of backups and serve as a fail-over when a device is faulty.

Supporting Information:

The Municipality currently uses the Acronis backup solution which allows for automated backup and the recovery of information stored on computers.

The Gartner Magic Quadrant for Data Center Backup and Recovery Solutions does not list Acronis as a recommended solution anymore. This is an indication that another backup solution should be considered when it becomes necessary to purchase backup software.

Figure 1. Magic Quadrant for Data Center Backup and Recovery Solutions

Source: Gartner (July 2017)

1.5. ICT Staff Trainings

Timeframe: One formal ICT training per annum per staff member
Continuous Skills Transfer

Senqu Municipality Values

- Good governance
- People Development

Discussion points highlighted by Management:

- ICT staff are heavily reliant on service providers to assist end user with ICT related problems.
- ICT staff have not received adequate training to keep skill levels up to date with the latest technology in terms of hardware and software.
- The lead time in resolving ICT issues is extensive and causes frustration within the Municipality.

Approach:

1. A skills review for ICT staff should be performed and staff should receive training where gaps are identified.

2. Senqu Municipality should ensure that there is a transfer of skills and expertise from service providers to ICT staff when vendors are onsite at the Municipality.

3. Service Level Agreements with ICT service providers should contain clauses that cater for the transfer of skills to ICT staff.

Supporting Information:

There are a number of ICT courses available and a few examples are listed below:

- The municipality has standardised on Microsoft, therefore some of the training offered by Microsoft is as follows:

    - Microsoft Certified Solutions Expert (MCSE): A number of MSCE certifications are available as depicted below.

Microsoft Certified Solutions Expert (MCSE)
The globally recognised standard for IT professionals

Prove your ability to build innovative solutions across multiple technologies, both on-premises and in the cloud.

Choose a certification to view its details and required exams:

MCSE: Server Infrastructure	MCSE: Desktop Infrastructure	MCSE: Private Cloud	MCSE: Enterprise Devices and Apps	MCSE: Data Platform	MCSE: Business Intelligence
MCSE: Messaging	MCSE: Communication	MCSE: SharePoint			
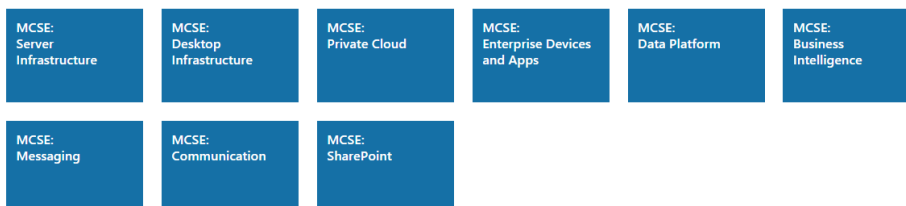
    - The MCSE: Server Infrastructure certification validates that you have the skills needed to run a highly efficient and modern data centre, with expertise in identity management,

systems management, virtualisation, storage and networking. Earning an MCSE: Server Infrastructure certification will qualify you for jobs such as computer support specialist and information security analyst.

- The MCSE: Private Cloud Certification proves your expertise in managing and implementing Microsoft private cloud computing technologies. With Windows Server and System Center, you will build your Microsoft private cloud solution to optimise ICT service delivery and gain the automation and flexibility you need for your ICT infrastructure, now and in the future. Earning an MCSE: Private Cloud certification will qualify you for jobs such as server administrator, systems programmer and network manager.

- The MCSE: Enterprise Devices and Apps certification validates that you have the skills needed to manage devices in today's bring-your-own-device (BYOD) enterprise. It qualifies you for a career path which can range from traditional desktop support technician to enterprise management of BYOD devices and apps.

- The MCSE: Data Platform Certification demonstrate your broad skill sets in building and administrating enterprise-scale data solutions both on-premises and in cloud environments. Earning an MCSE: Data Platform certification will qualify you for jobs such as database analyst and database designer.

- The MCSE: Business Intelligence certification proves that you have the skills and techniques needed to design, build and deploy solutions that deliver more data to more people across the organisation. Earning an MCSE: Business Intelligence certification will qualify you for a position as a BI and reporting engineer.

- The MCSE: Messaging certification validates your ability to move your company to the cloud, increase user productivity and flexibility, reduce data loss, and improve data security for your organisation. Earning an MCSE: Messaging certification will qualify you for a position in network and computer systems administration.

- The MCSE: Communication certification validates your expertise in creating a consistent communications experience for your organisation and connecting your colleagues to people around the world. Earning an MCSE: Communication certification will qualify you for a position in network and computer systems administration.

Source: www.microsoft.com

- ISACA offers the following certifications:

  - Certified Information Systems Auditor (CISA) certification is world-renowned as the standard of achievement for those who audit, control, monitor and assess an organization's Information Communication Technology and business systems.
  - Certified Information Security Manager (CISM) - The management-focused CISM is the globally accepted standard for individuals who design, build and manage enterprise information security programs. CISM is the leading credential for information security managers.
  - Certified in the Governance of Enterprise ICT (CGEIT) recognizes a range of professionals for their knowledge and application of enterprise ICT governance principles and practices. CGEIT provides you the credibility to discuss critical issues around governance and strategic alignment based on your recognized skills, knowledge and business experience.

- Certified in Risk and Information Systems Control (CRISC) (pronounced "see-risk") is the only certification that positions ICT professionals for future career growth by linking ICT risk management to enterprise risk management, and positioning them to become strategic partners to the business.
- Cybersecurity Nexus – CSX Certificate and CSX-P Certification - As the cyber landscape continues to rapidly evolve, it's not enough to rely solely on knowledge and theory. A performance-based CSX certification is a testament to your real-life skills and experience and proclaims that your commitment, tenacity, and abilities exceed expectations. CSX programs and certifications help individuals demonstrate their skills and prove that they know the most current cyber security standards, and offer employers confidence that their employees are up to demanding tasks.

Source: www.isaca.org

- CompTIA offers vendor neutral training for ICT Professionals as listed below:

  - CompTIA A+: A+ is the starting point for a career in ICT. The performance-based exams certify foundational ICT skills across a variety of devices and operating systems.
  - CompTIA Cloud+: Cloud+ validates the skills and expertise required to securely implement, maintain and utilize cloud technologies.
  - CompTIA Linux+: Linux+ is an internationally recognized credential validating technical competencies required for junior-level Linux administrators.
  - CompTIA Mobility+: Mobility+ certifies the knowledge and skills required to understand and troubleshoot various mobile devices and aspects of wireless technologies.
  - CompTIA Network+: Network+ certifies the essential skills needed to confidently design, configure, manage and troubleshoot any wired and wireless devices.
  - CompTIA Project+: Project+ validates the ability to initiate, manage and complete a project or business initiative on time and within budget.
  - CompTIA Security+: Security+ provides a global benchmark for best practices in ICT network and operational security, one of the fastest-growing fields in ICT.
  - CompTIA Storage+: Storage+ Powered by SNIA certifies knowledge and skills required to configure basic networks to include archive, backup and restoration technologies.
  - CompTIA Server+: Server+ demonstrates the technical knowledge and skills required to perform a variety of tasks on server platforms.

Source: www.comptia.org

1.6. Reduction of Printing Cost

Timeframe: Continuous Process

Senqu Municipality Values

- Good governance
- Teamwork

Discussion points highlighted by Management:

- Most end users have their own printer.
- Some users share a networked Mono printer in their work area.
- One bulk colour printer was installed between IPME and Community Services to test the viability of installing more of these printers instead of single-user printers.

Approach:

1. Senqu Municipality has considered using multifunction network printers instead of personal printers as it was assumed that this will significantly reduce printing costs but scientific research will be done and SEM via ICT Steering Committee will be sent a reports with recommendations in this regard.

2. Multifunction network printers have the capability to email, fax, photocopy, print and scan and will assist the Municipality when the Electronic Document and Records Management System is operational. Desktop printers purchased by the Municipality are also Multifunction network printers.

3. The Municipality should consider using a service provider to maintain and support Bulk printers once installed.

4. A Service Level Agreement for the maintenance and support of bulk printers should be in place with the selected service provider and disposal of old printers have to be done as well by Asset management personnel/responsible section.

5. There will be instances where an official requires a personal printer. In such cases, the official should provide business justification and obtain approval from management.

Supporting Information

Cost Effective

Many of the old assumptions with regard to the benefits of Bulk printers are no longer true.

It is always assumed that cost per copy on a bulk printer is lower than on a desktop printer. In cost per copy comparisons, taking cost of the printer, lifespan etc into account, between bulk (black only) and smaller printers (black only) result in similar cost. Using original cartridges on the smaller printer works out very slightly more expensive. Using good substitute cartridges result in a slightly lower cost than the bulk printer.

Both Bulk printers and Multifunction Desktop printers can scan, copy, print and fax and both can be networked.

Benefits of bulk printing

- ***Enhanced printing capabilities:*** Bulk printers are designed to handle more complex and larger tasks with a higher quality than personal printers.

Disadvantages of networked printing

Is it really Cost Effective to share a bulk printer and who takes responsibility?

Currently the printer is used by Community Services and DTPS. It is used until there is no paper or until there is a fault at which stage is left and not reported.

The ICT Section is responsible for checking usage and reporting on it. If the printer is faulty, it is only noticed by ICT at month end. ICT then sorts out the problem (if possible) or reports it to the Service Provider.

The Communications Section is responsible for payment and the Acting MM is responsible for Signing the Evaluation Report. The result of this splitting the responsibilities is that the printer seldom works and invoices are not paid for long periods.

1.7. Social Media

Note: Social Media falls under the Communications, Customer Care, Tourism and ICT Sections. The ICT Section makes Social Media platforms available, designs and maintains the Website and controls access from within the Municipality. All Social Media has been included in the Strategic Plan for the sake of completeness and in order to make recommendations.

Timeframe: Continuous

Senqu Municipality Values

- Public Participation
- ICT Service Desk/ Helpdesk

Discussion points highlighted by Management:

- The full potential of Social Media has not been exploited.

Approach:

Employee Use of Social Media

1. The Social Media Policy must be kept current and it is recommended that HR and legal counsel be engaged when updating the policy.

2. The policy should be communicated to all staff within Senqu Municipality.

3. Senqu Municipality should opening-up social media sites before and after business hours as well as during the designated lunch break.

4. A social media training program should be developed to train employees on how to use social media responsibly as well as how to exploit social media as a valuable business tool.

Municipality Use of Social Media

5. Senqu Municipality should take a decision as to which social media platforms the municipality should endorse.

6. A staff member should be given the responsibility to manage Senqu Municipality's presence on social media sites. The individual should be provided with Public Relations (PR) training to ensure that they respond in a courteous and responsible manner.

7. Senqu Municipality must ensure that responses to users' posts and queries are dealt with timeously should the municipality decide to have a presence on social media platforms.

8. Senqu Municipality should consider specialised social media monitoring tools to assist the organisation with monitoring and responding to posts on social media sites.

Supporting Information:

The most popular social media sites are illustrated below.

The diagram below illustrates user expectations regarding response times to posts on social media sites.

Free Social Media Monitoring Tools

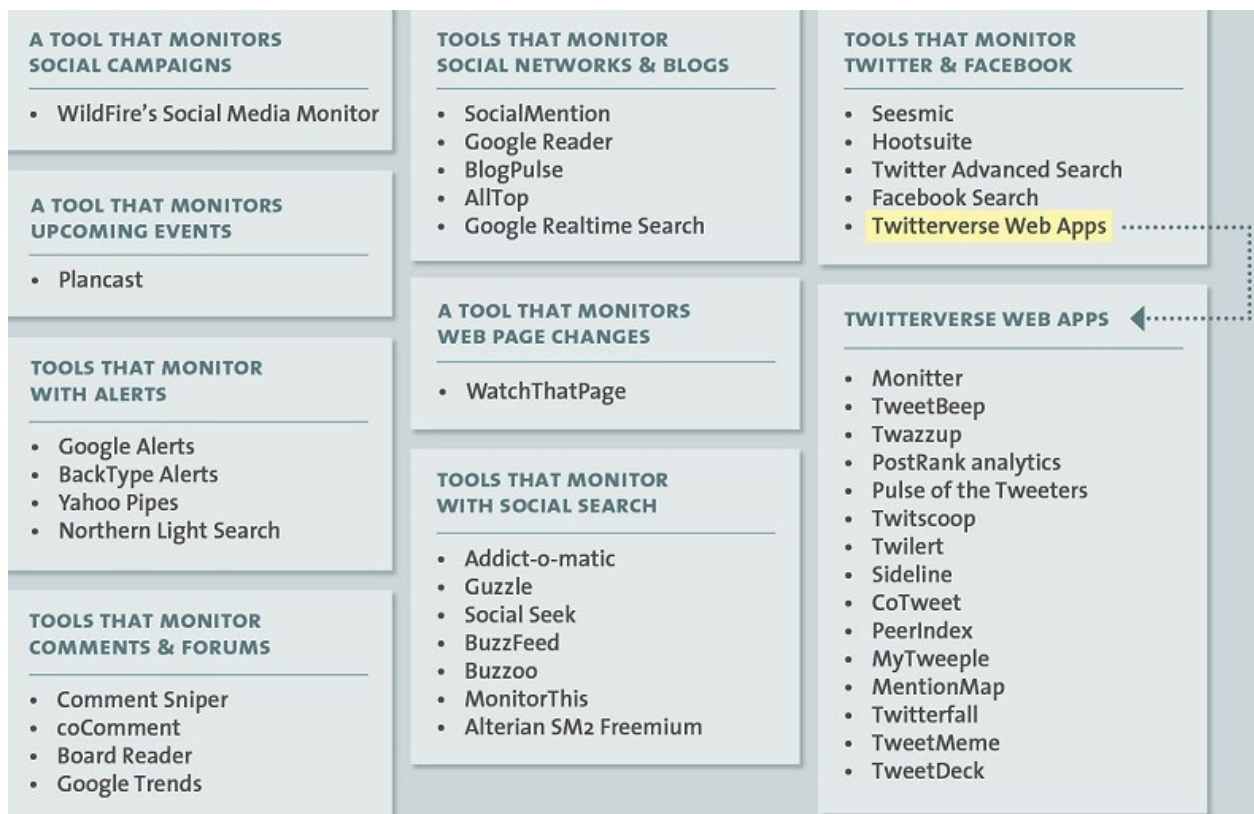|		
A TOOL THAT MONITORS SOCIAL CAMPAIGNS • WildFire's Social Media Monitor	**TOOLS THAT MONITOR SOCIAL NETWORKS & BLOGS** • SocialMention • Google Reader • BlogPulse • AllTop • Google Realtime Search	**TOOLS THAT MONITOR TWITTER & FACEBOOK** • Seesmic • Hootsuite • Twitter Advanced Search • Facebook Search • Twitterverse Web Apps
A TOOL THAT MONITORS UPCOMING EVENTS • Plancast	**A TOOL THAT MONITORS WEB PAGE CHANGES** • WatchThatPage	**TWITTERVERSE WEB APPS** • Monitter • TweetBeep • Twazzup • PostRank analytics
TOOLS THAT MONITOR WITH ALERTS • Google Alerts • BackType Alerts • Yahoo Pipes • Northern Light Search	**TOOLS THAT MONITOR WITH SOCIAL SEARCH** • Addict-o-matic • Guzzle • Social Seek • BuzzFeed • Buzzoo • MonitorThis • Alterian SM2 Freemium	• Pulse of the Tweeters • Twitscoop • Twilert • Sideline • CoTweet • PeerIndex • MyTweeple • MentionMap • Twitterfall • TweetMeme • TweetDeck
TOOLS THAT MONITOR COMMENTS & FORUMS • Comment Sniper • coComment • Board Reader • Google Trends		

Feedback Response Strategies

How and when you respond to comments is important. A timely response is imperative. Do not let something sit out there for days. Responding quickly demonstrates that you feel what your customers have to say is important. The staff member responding should be trained to use a consistent voice and brand response. Promptly respond to both positive and negative social media feedback.

Responding to Positive Feedback:

• Be sure to "thank" the customer for their kind words; let them know you appreciate their feedback and look forward to continuing to serve them.
• Consider asking if you may share their feedback in social media or use it as a testimonial on your website and/or marketing materials.

Responding to Negative Feedback:

• Always remain positive and do not get defensive.
• Respond as quickly as possible, but do not do so out of anger. Cool down first and take a deep breath!
• Reach out and let them now you take their concerns seriously and would like to discuss further via telephone or in person. Sometimes this diffuses the situation and also shows that you do care about how they feel.
• Listen and learn – perhaps the person complaining does have a legitimate reason! This can provide you with valuable insight into your offerings and customer service. If there truly is a weakness, now you know and can address it.

- Make amends – ask the customer what it is you can do to make it right. If their request is reasonable, then do it.

All social media feedback, good and bad, can help you better understand your services. If followers continually compliment or complain about a particular service or employee, use what they say to help guide your business strategy. Think of social media as your own "focus group". Organisations pay a lot of money to gather insights from traditional focus groups. Social media puts one right in the palm of your hands! Used wisely, social media can become a very powerful marketing tool for your organisation.

Source: www.maximizesocialbusiness.com

1.8. Improve Physical Security and Environmental Controls

Timeframe: 2021-2022 New Server Room & 2022-2024 Revamp Old server Room

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- The Municipality is exposed to the following environmental risks due to inadequate setup of the server room:
    - The server room walls are insulated with polystyrene.
    - The smoke detector is very basic. It sounds and alarm which may not be audible by the security guards in the security house about 50m away.
    - The server room has 2 entrances protected by locked wooden doors and locked security gates which are accessed by lock and key.
    - Temperature is monitored by a device which sends alarm to a cell phone if the room temperature exceeds a pre-set temperature.
    - The smoke detector is very basic. It sounds and alarm which may not be audible by the security guards in the security house about 50m away.
    - The floor is covered by carpets.
    - The server room does not have a raised floor.
    - There is no water detection system.
    - There is no fire suppression system.
    - Paper based access register is used and very risky for security on the server(s)
- Some cabinets containing Network Equipment are not lockable.

Approach:

1. The new server room which is currently being constructed should be adequately protected against physical security and environmental threats. As such, Senqu Municipality should ensure that the following physical security and environmental controls are in place:

    1.1. The walls of the server room should be fire-proof.
    1.2. A fire-proof door should be installed.
    1.3. A biometric finger print reader should be installed to control access to the server room.
    1.4. A temperature monitoring system should be installed that will alert the ICT Manager if the temperature rises too high or when the smoke detectors are activated.
    1.5. Smoke detectors should be installed.
    1.6. A raised floor should be fitted in the server room.
    1.7. A water/moisture detection system should be installed in the server room under the raised flooring.
    1.8. Hand held fire extinguishers should be installed outside of the server room.
    1.9. A fire suppression system that is safe for computing systems should be installed.

2. The Municipality should ensure that all ICT systems are housed in the server rooms.

3. When the new Server Room is fully operational, the Server Room in the Main Building (current Server Room) must be used as an additional store room for ICT equipment, and the Barkly East Admin Offices must be changed to comply with all requirements. It should then serve as a second

server room for the Municipality and Municipality Disaster Recovery Site, Offsite Backups replication server room.

4. Locking mechanisms should be installed in all cupboards containing network infrastructure components.

Supporting Information:

Ambient room monitoring

Ambient room monitoring is the environmental monitoring of the room for its humidity and temperature levels. Temperature and humidity sensors are typically deployed in:

- potential "hot zones" inside the server room or data center

- near air conditioning units to detect failure of such systems.

When multiple air conditioning systems are available in a room, then a failure of one system will initially be compensated by the others before it may lead to a total failure of the cooling system due to overload. As a result temperature / airflow sensors are recommended near each unit to get early failure detection.

Humidity in server rooms should be between 40% and 60% H. Too dry will result in the build-up of static electricity on the systems. Too humid and corrosion will start slowly damaging your equipment resulting in permanent equipment failures.

Temperature monitoring is of utmost importance as a failing air conditioning unit will have a way faster impact on the systems lifetime and availability (fans stress, CPU overheating) and running a room at higher temperatures may also affect non rack mounted equipment.
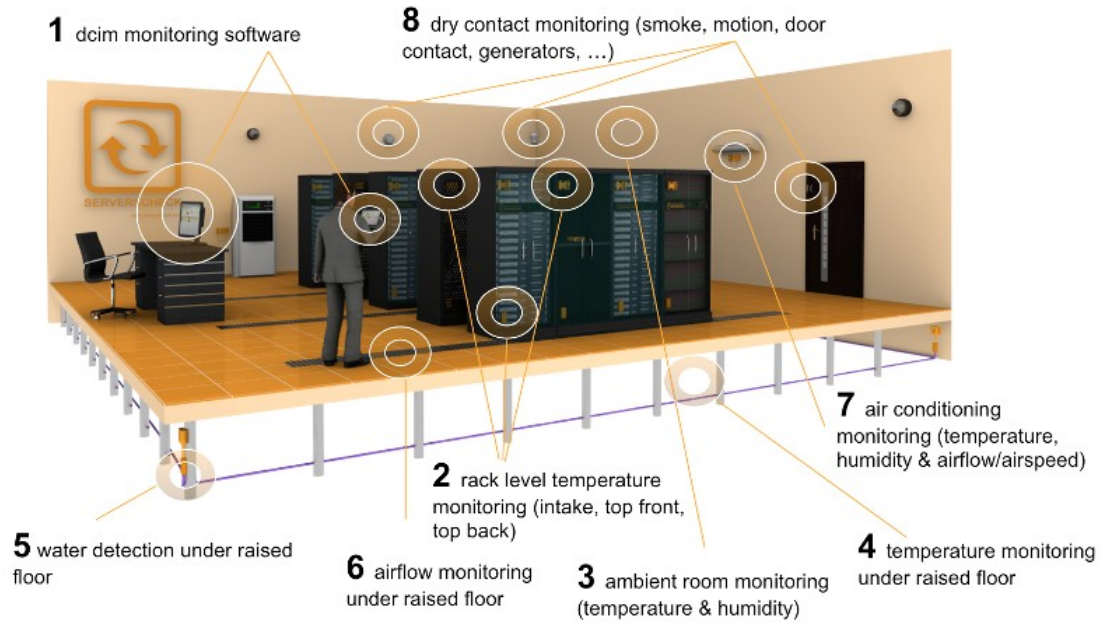
When using hot corridors it is important to monitor temperature across the room to ensure that sufficient cold air gets to each rack. In this case however one can also rely on rack based temperature sensors in addition of temperature and humidity sensors close to each air conditioning unit.

Water & Flooding Monitoring

The four main sources of water in a server room are:

- Leaking air conditioning systems: a water sensor should be placed under each AC unit
- Water leaks in floors or roof above the data center & server room: water sensors should be put around the perimeter of the room at around 50cm/3ft from the outer walls
- Leaks of water pipes running through server rooms: a water sensor should be placed under the raised floors
- Traditional flooding: same as second point for water leaks from roof or above floors applies

The diagram overleaf illustrates best practices for Data Center Infrastructure and Server Room Environmental Monitoring.

1 dcim monitoring software

8 dry contact monitoring (smoke, motion, door contact, generators, …)

2 rack level temperature monitoring (intake, top front, top back)

5 water detection under raised floor

6 airflow monitoring under raised floor

3 ambient room monitoring (temperature & humidity)

7 air conditioning monitoring (temperature, humidity & airflow/airspeed)

4 temperature monitoring under raised floor

Source: www.serverscheck.com

1.9. Establishment of Super Users

Timeframe: Revise Annually and/or as when required

Senqu Municipality Values

a. Good governance
b. Teamwork

Discussion points highlighted by Management:

a. ICT staff are heavily reliant on service providers to assist end user with ICT related problems.

Approach:

a. Senqu Municipality should identify and train super users within each business unit.

b. Super users should be responsible for first line support and training for general users on business applications.

c. Super users should be involved in the implementation process of applications being deployed or upgraded.

Supporting Information:

Super users have extensive knowledge of systems utilised by their business unit. They are the champions whom users seek advice from for any system related queries and issues. Super users are responsible for providing tips and shortcuts to users, as well as teaching new employees how to navigate the system.

The typical characteristics of super users are as follows:

a. Have extensive knowledge of business processes.
b. Are able to learn new concepts quickly.
c. Are willing to assist others when they encounter issues.
d. Have been at the organisation for a long time.

1.10. Enterprise Resource Planning System

Timeframe: 12 months

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Sebata has a limit on the number of characters that can be entered when creating technical specifications for quotes or tenders. As a result, incorrect items are ordered and cannot be used.

Approach:

1. The mSCOA compliant ERP system should replace the FMS system. The ERP system does not have the above limitations.

Supporting Information:

None

1.11. Purchase and Installation of archiving compliant Email

Timeframe: 3 Years

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Outdated MS Exchange software is not compatible with new MS Office software

Approach:

- Purchase and install new Exchange which is also mSCOA compliant as it does Archiving

Supporting Information:

None

1.12. Installation of Lightning Protection

Timeframe: 12 Months

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Equipment is not earthed, and this poses a threat of equipment being lost due to lightning.

Approach:

- Identify all equipment that is in potential danger of being struck by lightning and get someone to earth all identified equipment.

Supporting Information:

None

1.13. Installation of Video Conferencing Facilities

Timeframe: 36 Months

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Lack of modern communication technology limits possibilities of video conferencing which could result in cost savings

Approach:

- Purchase and install Skype/Video/Yealink Video Conference

Supporting Information:

None

1.14. Development of the VPN and Cloud Based Secured Technologies

Timeframe: 2.5 Years

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Constant attempted attacks make Cloud vulnerable

Approach:

- Incorporating Cloud with VPN which is more secure solution. Managed VPN Software adds an additional layer of security to prevent unauthorised access.

Supporting Information:

None

1.15. Internet Access nodes for the community

Timeframe: Continuous

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Repeated requests from the community require the identification of Internet Nodes where members of the community can have free access to Internet.

Approach:

- The Senqu Municipality is already busy with the process of ensuring that systems accessibility is attained at all material times. Assist where possible and identify Nodes where Senqu could provide free Internet Access to our employees and councillors.

Supporting Information:

None

1.16. Procure ICT Equipment

Timeframe: Annually and/or as when required

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Purchase and disposal of various ICT Equipment for all Departments of Senqu Municipality through council approved disposal and insurance policies.

Approach:

- Identify required ICT Equipment, go out on Tender and Procure.
- Appointment of specialised ICT Consultancy for systems upgrade

Supporting Information:

None

1.17.   Procure Network Equipment

Timeframe: Annually and/or as when required

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Purchase Network and Server Infrastructure

Approach:

- Identify required Network and Server Equipment to be purchased, go out on Tender and Procure.

Supporting Information:

None

1.18.   ICT Network Maintenance and Server Support

Timeframe: Contract Duration 3 Years

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- ICT Staff need professional assistance with server and network maintenance.
- The then existed contract expired 30 June 2019.

Approach:

1. Identify the areas in which Technical support is required, go out on tender for a provider with the necessary skills and appoint a service provider.
2. Ensure that Skills Transfer is covered in the contract.
3. Go out on Tender for a 3-year contract.

Supporting Information:

None

1.19. VPN Line Rental (Network Connectivity and Bandwidth)

Timeframe: Contract Duration 3 Years

Senqu Municipality Values

• Good Governance

Discussion points highlighted by Management:

• Data line (Fixed Line) speeds are limited and as a result, EMS is problematic as it has to share bandwidth with existing operations such as email, internet and telephones and all of these will be affected and be slow or not work at all.
• All office related operations (email, internet, network access, telephones and cameras) of Technical, DTPS and Community Services may come to an abrupt end if the Fibre Optic cable, currently running in the ceiling of the old age home building, is accidentally cut or damaged during building operations.
• Operations (including telephones and cameras) of Fleet and Tourism Offices in Lady Grey may be affected by slow/unstable network connectivity.

Approach:

1. Perform an evaluation of the network in order to determine the Municipality's bandwidth requirements. This should be done in consultation with the telecommunications provider. Increase Bandwidth to suit the requirements when going out on tender for a new service provider.
2. Install an alternate Fibre Optic cable which runs in a channel along the side of the building where it is safe to ensure continuous operations during building operations.
3. Install Fibre Optic Cable which integrates with the Servers in Lady Grey seamlessly and would result in more stable connectivity and unrestricted speed and it would also limit damage caused by lighting and weather as fibre optic cable is not affected by rain, cold and lightning as is the case with other materials.

Supporting Information:

• The Municipality is making use of a fully integrated wireless network but bandwidth and speed needs to increase in order to cope with the demand from the EMS system.
• In addition, backup wireless connectivity will also be available through another wireless service provider to cater for redundancy.

1.20. Network Security Control Solution (Replace and Increase Security Software coverage – Firewall)

Timeframe: Contract Duration 3 Years
Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

The contract for the provision of network, system and server security expires on 31 October 2019.

Approach:

1. The Municipality must go out on tender to find a specialist company that can take care of security.

Supporting Information:

None

1.21. Antivirus Software Licenses (Replace and Increase Antivirus Coverage)

Timeframe: Contract Duration 3 Years
Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- The 3-year contract for the antivirus solution is expired on 31 October 2019 and renewed

Approach:

1. The Municipality should go out on tender for an antivirus solution in order to continue to protect the Municipality against malware and virus threats. According to Gartner, the currently used package, ESET is one of the challengers in terms of antivirus service providers. It has proven to be an excellent solution as no problems were experienced. When considering a new antivirus package, any of the packages in the Gartner Magic Quadrant could be considered a recommended package.

Supporting Information:

Antivirus

According to the Gartner Magic Quadrant for Endpoint Protection Platforms, ESET is a Challenger in terms of antivirus service providers.

CHALLENGERS — LEADERS

Symantec
Trend Micro
Sophos
ESET
Kaspersky Lab
CrowdStrike
Cylance McAfee
Panda Security
Microsoft
Malwarebytes
Bitdefender Palo Alto Networks
Carbon Black
F-Secure
Comodo
SentinelOne Endgame
Cisco
FireEye
Fortinet

NICHE PLAYERS — VISIONARIES

COMPLETENESS OF VISION ⟶   As of January 2018   © Gartner, Inc

1.22. Rental of Offsite Backup Premises

Timeframe: Contract Duration 3 Years

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- The tender for Rental of an Offsite Backup Facility expires every 3 years.

Approach:

1. Newly built Barkly East Admin Building will serve as a replication of cloud backups
2. Then the municipality will go out on tender for new Offsite Backup Facilities

Supporting Information:

None

1.23. Automation of Business Processes

Timeframe: Continuous

Senqu Municipality Values

- Good governance

Discussion points highlighted by Management:

- The following processes are performed manually:
  - Asset Management – Finance Department.
  - Performance Management – DTPS (Risk and Compliance).
  - Audit Management – Office of the MM (Internal Audit).
  - Risk and Compliance Management – DTPS (Risk and Compliance).
  - Supply Chain Management - Finance.
  - Contract Management – Finance and Corporate Services.
  - Inventory Management - Finance.
  - Electronic Documents and Records Management- Corporate Services.
  - Revenue Management – Finance
  - ICT Helpdesk/Service Desk- Finance
  - Biometrics Clocking and Security System-Corporate Services
- Employees are making use of manual forms to submit leave, in addition, Staff located at the Barkly East and Sterkspruit satellite offices must drive to Lady Grey to submit leave forms.

Approach:

1. Senqu Municipality should consider using a phased approach to automate the following business processes:

   1.1. Asset Management.
   1.2. ICT End-Users Queries, Requests Management
   1.3. Performance Management.
   1.4. Audit Management
   1.5. Risk and Compliance Management
   1.6. Supply Chain Management.
   1.7. Contract Management.
   1.8. Inventory Management.
   1.9. Records Management.
   1.10.   Leave.

2. It would be recommended to phase-in one business process at a time as this will minimise the impact on the organisation and staff.

3. Detailed training should be provided to staff once the above business processes have been automated.

4. The training should be in-depth and contain sufficient details in terms of the automated business processes. In addition, training should be instructor led and computer based to ensure that Senqu Municipality staff become familiar with the automated business processes.

5. Once the Document Management System is in place, the Records Management Policy should be updated to cater for the electronic storage of records.

6. Management should conduct an evaluation of the additional modules offered by Sebata to understand which other municipalities are using these modules. From the municipalities who agreed to be interviewed, as part of our review, we noted that they were only using Sebata for the finance and payroll modules. We would not recommend that Senqu Municipality be the first municipality to trial modules which have not been tested at other entities.

Supporting Information:

None

1.24. Improvement to Time and Attendance System

Note: The Time and Attendance System falls under Corporate Services. Although ICT is not responsible for the system, it is backed up by ICT and has been included in the Strategic Plan for the sake of completeness and to make recommendations.

Timeframe: Unknown

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- After some employees have scanned in using the biometric fingerprint reader, the time and attendance system records them as absent. Thereafter, HR must confirm whether these employees were absent from work.
- The Time and Attendance and Payroll systems are not interfaced.
- The Time and Attendance System is one of the systems that are hosted on a user's computer and must be migrated to be in the server to alleviate the risks associated with user's computer

Approach:

1. The issues with the Time and attendance system should be investigated and resolved as a matter of urgency with the vendor.

2. The Time and Attendance System and Payroll System should be interfaced to reduce the time spent reconciling the data on the systems. This should only be done once issues with the time and attendance system have been resolved.

3. The Time and Attendance System should be hosted on a server inside the Server Room

Supporting Information:

None

1.25. Customer Care and Helpdesk Management

Note: The Customer Care System falls under Corporate Services. Although ICT is not responsible for the system, it is backed up by ICT and has been included in the Strategic Plan for the sake of completeness and to make recommendations.

Timeframe: Unknown

Senqu Municipality Values

- Good governance
- Accountability
- Public Participation
- Responsibility

Discussion points highlighted by Management:

- A hotline number exists which customers can use for account queries and fault reporting, however, details of calls received are recorded in MS Excel.
- Some customers are bypassing the hotline number and are calling technicians directly to resolve faults.
- The call log is stored on a user's local drive.

Approach:

1. The hotline number should be marketed to all customers. This number should be used by customers to log calls related to billing enquiries and reporting of faults.

2. Senqu Municipality should consider implementing software for logging and tracking customer calls.

3. Customer Care Agents must be able to register the customer's query and provide the customer with a reference number generated by the system.

4. The reference number should be provided to a customer for any unresolved query as it serves as proof of a customer having lodged a query. The reference number should be used to facilitate follow-ups and escalation of the query if it has not been resolved.

5. Senqu Municipality should enforce the use of the hotline number by only accepting queries that are logged using the hotline number.

Supporting Information:

The Customer Care Centre should:
- Serve as the conduit for receiving feedback regarding the quality of services.
- Provide information to customers on the costs involved in service provision, the reasons for the payment of service fees and the manner in which monies raised from services are utilised.

- Serve as the point at which queries regarding accounts may be submitted and shall deal with such queries.
- Serve as the point at which complaints may be submitted and shall respond to such complaints.

1.26. Infrastructure and Maintenance Management

Note: Maintenance Management falls under Corporate Services. It has been included in the Strategic Plan for the sake of completeness and in order to make recommendations.

Timeframe: Continuous

Senqu Municipality Values

- Public Participation
- Responsibility

Discussion points highlighted by Management:

- Infrastructure and maintenance management is a manual process.
- Job cards are paper based.

Approach:

1. Activities such as maintenance planning, generation of job cards and inventory management should be automated.

2. Senqu Municipality should consider implementing SolarWinds solution that will have all functionalities to support ICT section in making sure that systems with faults are identified proactively.

3. Handheld devices will enable field workers to complete job cards electronically whilst out in the field and ensures that field workers complete the necessary documentation immediately. These devices will improve efficiency of field workers as it will provide critical information that field workers require such as the location of pipes, valves and hydrants. Management have indicated that GPS co-ordinates are available on the GIS system for infrastructure in the field.

4. Field workers should receive adequate training on using handheld devices for receiving and completing job cards.

5. Sebata have indicated that they can provide modules to assist with maintenance management, however, we recommend that management consult with other municipalities that have implemented the maintenance management module of Sebata. We would not recommend that Senqu Municipality be the first municipality to implement this new module of Sebata.

6. The municipality should also evaluate other maintenance management systems available before making a final decision.

Supporting Information:

Ingress Protection (IP) Ratings Explained

- IP65 Enclosure - IP rated as "dust tight" and protected against water projected from a nozzle.

- IP66 Enclosure - IP rated as "dust tight" and protected against heavy seas or powerful jets of water.
- IP 67 Enclosures - IP rated as "dust tight" and protected against immersion.
- IP 68 Enclosures - IP rated as "dust tight" and protected against complete, continuous submersion in water.

1.27. Asset Management

Timeframe: Continuous

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

Asset management is a manual process where assets are scanned and recorded in MS Excel. The Master copy is on one person's computer which is backed up. Users who need information about assets are dependent on the person who has the master copy.

Note: ICT can only advise but and is not able to do anything without the support and budget from the management structure above.

Approach:
- Centralise the Asset Management System and allow users who need read access to obtain information from the system.

Supporting Information:

None

1.28. Hosting and Ransom

Note: The risk of allowing a third party to host critical Municipal Systems is something ICT can only warn the SEM. The ICT section cannot take any decisions about it as it is subject to approval from higher levels since it has some budget implications. It has been included in the Strategic Plan for the sake of completeness and to make recommendations.

Timeframe: Continuous

Senqu Municipality Values

- Good governance
- Accountability

Discussion points highlighted by Management:

- Loss of access to systems and data due to hosting by external companies which may be prone to hackers, backups not being done and who have the power to hold the municipality at ransom.

Note: This is a reality as the municipality was once held at ransom by the company who did and hosted the Municipal website. This could potentially happen to other systems such as ERP where control of the system is held by a company that already releases the fully paid license a few days at a time which is termed "Credit control measures". Implication are that the company will not allow access invoices are not paid.

Approach:
1. Hosting applications and data on the Senqu server room(s) and ensure that all our softwares are fully licensed.

Supporting Information:
None

Senqu Municipality Approval and Sign-Off

Date of Approval by Council: 08 May 2024

Effective Date: 1 July 2024

Resolution Number:

_____   _____

Mr T Mawonga   **DATE**

MUNICIPAL MANAGER

RECOMMENDATION

That the report be noted,

That the ICT Strategic Plan as part of the Municipal Corporate ICT Corporate Governance Framework Policy be approved by Council.