ICT MASTER PLAN

2020/21 - 2024/25

MBHASHE LOCAL MUNICIPALITY

PROJECT NAME:

ICT MASTER PLAN

PREPARED FOR: PREPARED BY:

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Version Control

	Description	Date	Reference
Version 1	Mbhashe ICT Master Plan	23 June 2020	2020-06-23 Mbhashe ICT Master Plan_Final
Version 2	Mbhashe ICT Master Plan	30 June 2021	2021-07-30 Mbhashe ICT Master Plan_vFinal
Version 3	Mbhashe ICT Master Plan	30 June 2022	2022-07-30 Mbhashe ICT Master Plan_vFinal
Approval			

Prepared by:

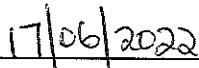| Designation	Name	Contact No.	E-mail
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Approval

The parties listed below duly authorise by way of their signatures of all items contained herein and annexed hereto:

Municipal Manager
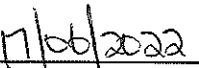**Mr M. Nako**

Signature

Date 17|06|2022

Executive Mayor
Cllr S. Janda

Signature

Date 17|06|2022

ICT MASTER PLAN 2020/21 - 2024/25

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Abbreviations

No	Abbreviation	Full title
1	ADM	Amathole District Municipality
2	AG	Auditor General
3	Broadband	High speed internet access
4	CGICT	Corporate Governance of ICT
5	COBIT®	Control Objectives for Information Technology
6	DM	District Municipality
7	EA	Enterprise Architecture
8	ERP	Enterprise Resource Planning
9	ICT	Information and Communications Technology
10	IDP	Integrated Development Plan
11	ISACA®	Information Systems Audit and Control Association
12	ITGI™	Information Technology Governance Institute
13	ITIL	The Information Technology Infrastructure Library
14	LM	Local Municipality
15	King IV	The King IV report and code on Governance for South Africa
16	MLM	Mbhashe Local Municipality
19	mSCOA	Municipal Standard Charter of Accounts
20	NDP	National Development Plan
21	OS	Operating Systems
22	SALGA	South African Local Government Association
23	SDBIP	Service Delivery and Budget Implementation Plan
24	TOGAF®	The Open Group Architecture Framework
25	ZACHMAN	The ZachMan Framework

1. Introduction

Mbhashe Local Municipality (MLM) ICT Master Plan (also referred to as an ICT Strategic Plan/ Information Infrastructure Plan), is a document which defines how an organization will meet future business problems using Information Communication and Technology (ICT). An ICT Master Plan translates the business vision, the municipal structure and behaviour of the municipality including its information systems into a strategic roadmap. In all, it is a component of strategic planning – which is technology focussed.

It is important to highlight that this ICT Master Plan should be read in conjunction with the ICT Governance framework and ICT Service Strategy documents, which are annexures to this main document.

The MLM ICT Master Plan is meant to outline the strategic direction in which the municipal management team seeks to deploy investments in ICT. The municipality has geared itself to use ICT as an enabler to improve performance. In this regard, there is a readiness to embrace emerging technologies that support the business by focusing on the following aspects:

- customer-centric service provision
- reduces redundancy, hence lower total cost of ownership; and
- achieve economies of scale by sharing services.

Research shows that organisations worldwide are losing out on their IT investments because they are failing to derive sufficient value from investments in IT (Bowen, Cheung and Rohde, 2007; ITGI, 2007). According to Ward and Peppard (1996), IT value is the contribution of information technology to the achievement of business goals. This means that when information technology supports the business strategy, an organization realizes IT value.

Generally, in local government in South Africa, technology is often used in isolation to business strategy, hence resulting in IT projects underperforming or not yielding the expected results. It is envisaged that the MLM ICT Master Plan will provide a clear implementation plan to enable the council to derive maximum value from ICT investments by aligning its investments with business objectives.

2. Legislative context

The MLM ICT Master plan is designed with reference to the applicable South African legislative landscape. The following legislation, among others, were considered:

1. Constitution of the Republic of South Africa Act, Act No. 108 of 1996;
2. Copyright Act, Act No. 98 of 1978;
3. Electronic Communications and Transactions Act, Act No. 25 of 2002;
4. Minimum Information Security Standards, as approved by Cabinet in 1996;
5. Municipal Finance Management Act, Act No. 56 of 2003;
6. Municipal Structures Act, Act No. 117 of 1998;

7. Municipal Systems Act, Act No. 32, of 2000;

8. National Archives and Record Service of South Africa Act, Act No. 43 of 1996;

9. Promotion of Access to Information Act, Act No. 2 of 2000;

10. Protection of Personal Information Act, Act No. 4 of 2013;

11. Regulation of Interception of Communications Act, Act No. 70 of 2002;

12. Treasury Regulations for departments, trading entities, constitutional institutions and public entities, Regulation 17 of 2005;

13. Public Administration Management Act, 2016; and

14. Minimum Interoperability Standards (MIOS) for Government Information Systems, 2011.

2.1 ICT Guiding Frameworks

Best practices and standards were drawn from the following frameworks and methodologies

1. Control Objectives for Information Technology (COBIT);

2. The Information Technology Infrastructure Library (ITIL);

3. International Organization for Standardization (ISO 38500);

4. The Open Group Architecture Framework (TOGAF);

5. The Zachman Framework (ZACHMAN); and

6. The King IV Report and Code on Governance for South Africa (King IV).

2.2 Aligning ICT frameworks to EA planning

For context, below is a brief outline of the frameworks as they relate to ICT strategic planning;

a. COBIT – *Control Objectives for Information Technology*
COBIT prescribes 210 control objectives applied to 34 high-level IT processes, categorized in four (4) domains: (a) Planning and Organization, (b) Acquisition and Implementation, (c) Delivery and Support, and (d) Monitoring. Alignment to COBIT objectives and processes ensures the effectiveness and value of IT as well as information security and process governance.

b. ITIL – *Information Technology Infrastructure library*
ITIL outlines best practices for IT operations and service delivery including security management.

c. TOGAF – *The Open Group Architecture Framework*
TOGAF is a process toolkit for providing an approach to designing, planning, implementing, and governing an enterprise IT architecture. It is typically modelled at four (4) levels: (a) Business, (b) Application, (c) Data, and (d) Technology. The TOGAF framework has specific dependencies around modularization, standardization, and already existing, proven technologies and products. TOGAF is not

a step-by-step methodology but provides an Architecture Development Method (ADM) through which ICT stakeholders can develop an ICT architecture to meet the business and ICT needs.

d. ZACHMAN – *The Zachman Framework*

This framework provides a formal and structured way of viewing and defining an enterprise. It embodies a two-dimensional classification schema that reflects the intersection between two classifications; primary and secondary. The primary is noted as interrogatives of the business targets, while the secondary is noted as the viewpoints through provisioning or identification of business artefacts.

3. Vision alignment

The development of the ICT Master Plan is aligned to the National, Provincial and District vision frameworks as depicted in the figure below.
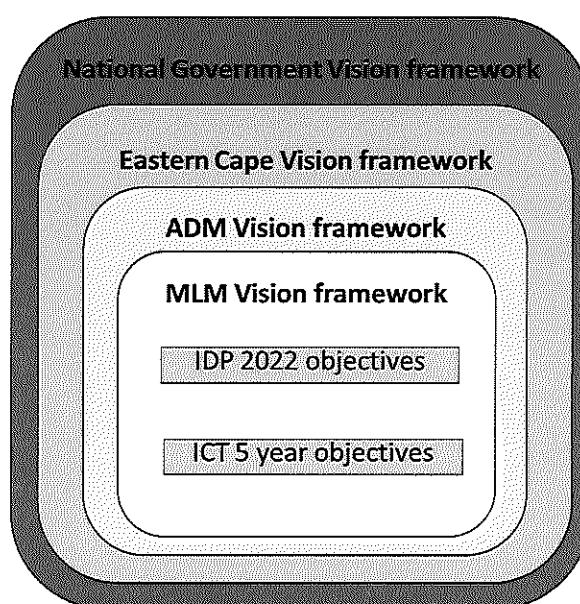
Figure 1: Vision framework

The Mbhashe Local Municipality vision and mission statement are as follows:

Vision:
A municipality that excels in promoting social cohesion, stimulates economic growth and sustainable development

Mission Statement:
By becoming an effective and efficient municipality with accountable leadership that is able to involve communities in the provision of quality services.

Also, the 2017-2022 IDP acknowledges that the municipality's key deliverables as articulated during the local government elections were as follows;
- Local government offices have to become more effective in meeting the needs of the citizens,
- Enhancing public participation and developing a responsive government.

- Building local economy focusing on high-value programmes and ensuring on agro-processing projects and /programmes.
- Mobilise resources beyond the allocated grant funding and own generated revenue to build sustainable infrastructure that will leverage the economic growth and development potential of our municipal area and forging partnerships and relations with other organisations and institutions.

3.1 ICT planning roadmap

To understand the alignment of the business and ICT vision in MLM below is a depiction of the ICT planning roadmap.

2013

Review of ICT Master Plan

2017

1. ICT Steering Committee TOR
2. Development of ICT Policies

2018

Review of ICT Policies

2019

Review of ICT Policies

2020

1. Review of 5-year ICT Master Plan
2. Review of ICT Governance framework
3. ICT Governance Charter
4. ICT Service Strategy
5. 5-year implementation plan
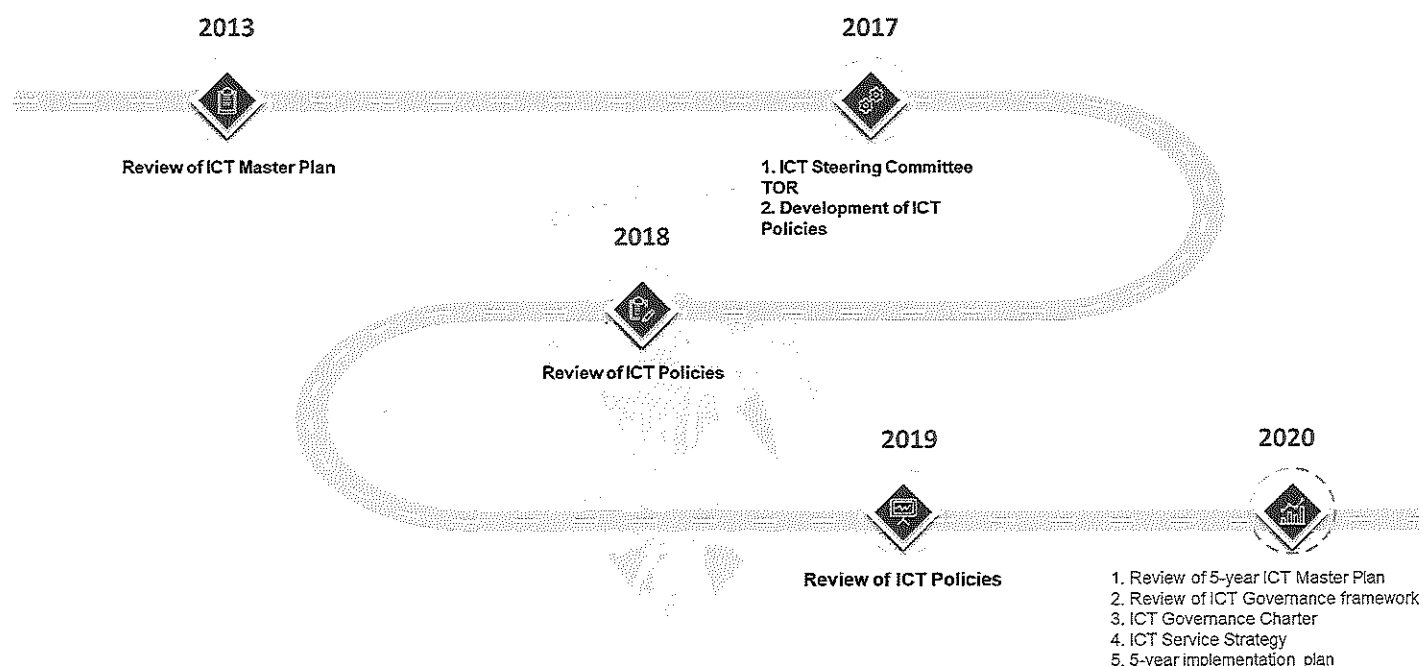
Figure 2: ICT planning roadmap

3.2 Mbhashe LM ICT Vision statement

Thus, the ICT vision and mission statements are as follows:

Vision

To ensure an integrated, stable and responsive ICT infrastructure by 2022

Mission statement

The effective, efficient, and economical utilisation of information and communication infrastructure in the provision of services to its customers and communication with all other stakeholders

Simply put:
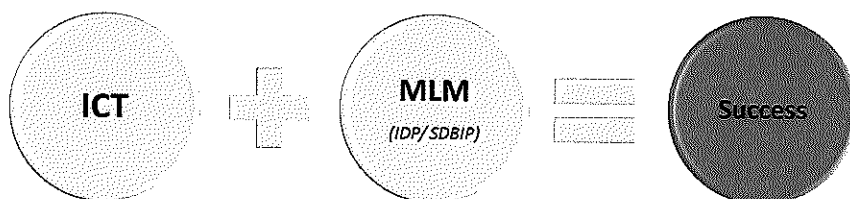
3.3 MLM Strategic objectives (2017-22)

According to the IDP, the following are the adopted strategic objectives of the municipality the council term ending 2021/22. These are noted herein as they represent municipal goals, that ICT must enable.

Good governance:
- To ensure clean and accountable governance in the municipality by 2022
- To ensure compliance with legislation as per Section 11 (3)(a) of Municipal Systems Act
- Ensure that all municipal properties are properly registered and effectively used by 2022
- To ensure adherence to sound environmental practises and to protect environmentally sensitive areas by 2022
- To ensure compliance with NBR and any applicable legislation by 2022
- Ensure maximum and adequate land use management practises by 2022
- To strengthen and ensure coordination of integrated and joint planning with spheres of government by 2022.
- To mainstream special programs into the municipality by 2022

Financial viability:
- To ensure compliance with budget and reporting regulations by 2022
- To achieve sound financial management through accountability and transparency
- To ensure maximization of revenue collection
- To alleviate poverty to improve quality of household life by 2022.
- Efficient, cost-effective and transparent Supply Chain Management system by 2022.
- To manage, control and maintain all assets of the municipality by 2022

Institutional development:
- To provide and enhance skills among the Councillors, Traditional Leaders, Ward Committees, unemployed youth and employees to ensure effective service delivery by 2022
- To attract, retain human capital of Mbhashe that will ensure effective and efficient service delivery by 2022
- To ensure monitoring and evaluation of IDP to improve institutional performance by 2022
- To create a conducive working environment for employees by 2022

- To ensure an integrated, stable and responsive ICT infrastructure by 2022.

Basic service delivery

- To provide effective and affordable services to the communities by 2022
- To facilitate the development of sustainable and viable human settlements by 2022

Local economic development

- To promote agrarian reform and increase food security to farming households by 2022
- To ensure use of agricultural value chain to stimulate local economic development in deprived areas by 2022
- To reduce poverty and unemployment through viable and sustainable job creation strategies by 2022
- To encourage investment through viable investment strategies by 2022
- To ensure reduction of employment rate through development and capacitation of enterprises by 2022
- To ensure the unlocking of marine economic opportunities by 2022
- To position and promote Mbhashe as a tourist destination of choice by 2022
- To develop and maintain heritage properties/resources to attract tourists by 2022

3.4 MLM Powers and functions

The powers and functions of MLM are as follows:

1. Beaches and Amusement facilities
2. Billboards and display of advertisements in public places
3. Building regulations
4. Cemeteries, funeral parlours and crematoria
5. Childcare facilities
6. Cleansing
7. Control of public nuisance
8. Control of undertakings that sell liquor to the public
9. Disaster
10. Facilities for the accommodation, care and burial of animals
11. Housing
12. Local sport facilities
13. Local Tourism
14. Municipal parks and recreation
15. Municipal Planning
16. Municipal Public Works
17. Municipal Roads
18. Pontoons and ferries
19. Pounds
20. Public Places
21. Storm water

22. Street lighting
23. Street trading
24. Trading regulations
25. Traffic and parking

4. MLM Envisioning framework for ICT Master Plan

The process followed in designing this ICT Master plan is *Transformation by Design*:

Definition: Putting empathy at the heart of the process to truly understand the perspective of others in guiding our design-led thinking.

- Understand community needs
- Drive business goals and alignment
- Assess technical feasibility.
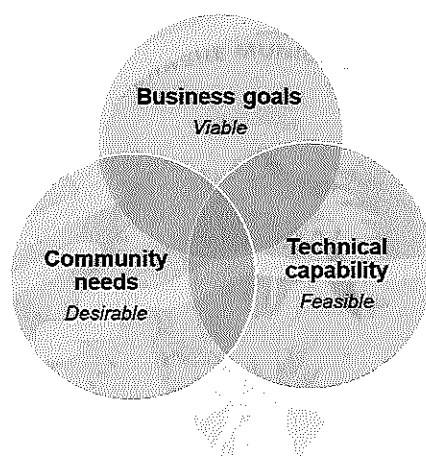
By using a design-led process, care is applied in the documentation of the stakeholder pain points, be it perceptions or real pain points. Section 5 below, outlines the pain points as solicited during the envisioning workshop.

5. MLM ICT Problem definition

The documentation of the pain points (also known as user requirements) is meant to surface issues that are leading to investments in ICT not yielding the desired returns. Also, this process is meant to highlight and guide the identification of business processes that need to be automated. The automation of these business processes will lead to the following benefits;

    a. Improved reporting and analysis of information,
    b. Improved decision making as a result,
    c. Enhanced accountability of the council,
    d. Improved governance at all levels,
    e. Enhanced transparency in planning, performance and reporting, and
    f. Quicker response to the increasing public demand for transparency.

Simply put, this process should yield in this evolution:

```
Pain points  →  Prioritised roadmap  →  Tangible future vision
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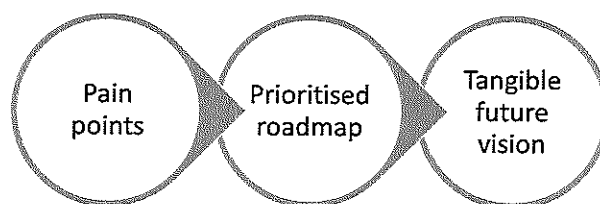
The process of determining the current information constraints/ user requirements included conducting one envision workshop at the municipal offices. Subsequently, several sessions were held with the ICT Manager to verify issues raised at the envisioning workshop.

Table 1 outlines the different types of challenges that the municipality is experiencing. The challenges range from leadership, technical, governance and social spheres.

Table 1: MLM ICT detailed problem definition

Impacted municipal areas

No	Problem Statement	Scenarios	Municipal Operations					Budget and Treasury						Dev Planning				Infrastructure Dev				Corporate Services					Community services					
			IDP	Public Participation	Communication	Council support	SPU	Revenue Mgt	Budgeting	Supply Chain	Asset Management	Expenditure Management	Customer Care	LED	Town planning	Building	Human Settlements	PMU	Mechanical	Electrical	Roads	Human Resource Dev	Labour relations	Facilities	ICT	Records	Traffic	Licencing	Disaster Mgt	Security services	Community Facilities	Parks, Cemeteries and Gardens
1	ICT awareness in the municipality	a. Generally, there is a lack of ICT awareness which leads to under utilization of available resources, examples •SAGE system functionalities (SAGE Evolution and SAGE 300 People); •use of Cibecs in backing up to the server. Observations show that users do not connect to the network to activate automated back-up processes. •GIS system also under utilised; •Bulk SMS system for communication internally and externally - and the community at large •Website b. Employees not fully aware of the benefits of 4th Industrial Revolution in local government c. The municipality does not have an intranet - for internal communication. This causes an over-reliance on email communcation. This throttles the bandwidth which is over utilised. d. Though a green agenda has been adopted (reduced printing), there is still a need to provide refresher training to Councillors to fully utilize file sharing solutions currently in use (Mimecast) •Councillors to fully utilise tools of trade	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Legend: ● High Impact   ◉ Medium Impact   ● Low Impact   None

Table 2 of 8: MLM ICT detailed problem definition

No	Problem Statement	Scenarios	Impacted municipal areas
			Municipal Operations: IDP, Public Participation, Communication, Council support, SPU, Revenue Mgt — **Budget and Treasury:** Budgeting, Supply Chain, Asset Management, Expenditure Management, Customer Care, LED — **Dev Planning:** Town planning, Building, Human Settlements — **Infrastructure Dev:** PMU, Mechanical, Electrical, Roads — **Corporate Services:** Human Resource Dev, Labour relations, Facilities, ICT, Records — **Community services:** Traffic, Licensing, Disaster Mgt, Security services, Community Facilities, Parks, Cemeteries and Gardens
2	Inconsistent and manual processes across the municipality	a. No business processes to create a workflow for solving customer related queries, resulting in consumers/ customer frustrations and delayed client service

b. Due to manual systems, customer information is not auto-populated during indigent registration, Housing registrations etc - leading to customer frustration and potential of reputation risk

c. Manual processes affecting reporting and monitoring in units such as:
- Pound management
- Cemetry management
- Revenue management
- Funeral requests for foreigners
- Land zoning
- Pauper burials
- Street lighting (verification of faults)
- Road maintenance
- Project management + payment processing for projects
- Fuel distribution monitoring + triggers
- Plant breakdown trigggers and impact analysis

d. Due to system inefficiencies, employees manually perform work which should be easily automated - may lead to job retention risks and low morale | Medium impact indicated across all impacted municipal areas |

Legend:

● High impact	◍ Medium impact	● Low impact	◌ None

Table 3 of 8: MLM ICT detailed problem definition

Table 3 of 8: MLM ICT detailed problem definition — matrix of "Impacted municipal areas" (grouped under Municipal Operations, Budget and Treasury, Dev Planning, Infrastructure Dev, Corporate Services, Community services) mapped against Problem Statement No. 3.

No	Problem Statement	Scenarios
3	Lack of easily accessible real time relevant data	a. No Customer Relationship Management system (CRM) leading to an inability to predict customer behaviour (seasonal queries & payment patterns) b. No MI (management information) to influence pro-active planning and project delivery c. Fraud management inhibited due to poor information management processes; example, no capacity to continuously analyse free basic services recipients and to determine refresh status of recipients d. No automated planning data to show Household profiles, Village profiles and Ward profiles

Impacted municipal areas column groups:
- Municipal Operations: IDP, Public Participation, Communication, Council support, SPU
- Budget and Treasury: Revenue Mgt, Budgeting, Supply Chain, Asset Management, Expenditure Management, Customer Care
- Dev Planning: LED, Town planning, Building, Human Settlements
- Infrastructure Dev: PMU, Mechanical, Electrical, Roads
- Corporate Services: Human Resource Dev, Labour relations, Facilities, ICT, Records, Traffic, Licencing
- Community services: Disaster Mgt, Security services, Community Facilities, Parks, Cemeteries and Gardens

Legend:

High Impact	Medium Impact	Low Impact	None

Table 4 of 8: MLM ICT detailed problem definition

Impacted municipal areas

No	Problem Statement	Scenarios	Municipal Operations					Budget and Treasury						Dev Planning				Infrastructure Dev				Corporate Services					Community services						
			IDP	Public Participation	Communication	Council support	SPU	Revenue Mgt	Budgeting	Supply Chain	Asset Management	Expenditure Management	Customer Care	LED	Town planning	Building	Human Settlements	PMU	Mechanical	Electrical	Roads	Human Resource Dev	Labour relations	Facilities	ICT	Records	Traffic	Licencing	Disaster Mgt	Security services	Community Facilities	Parks, Cemeteries and Gardens
4	Poor customer centric focus leading to poor customer service due to lack of IT enabled customer view	a. No automated customer care system (capability) to assist in solving customer queries b. No customer centric communication solution to unlock self-service capability; customer only gets assistance by contacting the municipality c. Poor first call resolution to client queries due to lack of accessibility of customer information d. The municipality has not adopted a communication channel which is cheaper, effective, and easily accessible to community members. The effectiveness of social media is yet to be established in the municipality. e. When employees receive follow up calls from customers, they are unable to identify the customer's last interaction with the municipality, resulting in multiple call backs and increased TATs *(Turn-around-Times)* f. No ability to assess complaints and failures effectively and in real time - leading to a reactive customer service model example, ability to monitor # of customer calls received daily/ weekly/ monthly; to monitor complaints resolved on time; ability to monitor complaints still open/ escalated g. Huge customer costs to access information from the municipality especially letters from the Speaker's office, funding notices from LED, tender notices etc	●	●	●	●	●	●	●	◌	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●	●	●	●	●

Legend

● High Impact	▨ Medium Impact	● Low Impact	⋯ None

Table 5 of 8: MLM ICT detailed problem definition

No	Problem Statement	Scenarios	Impacted municipal areas
5	Lack of transparency in service delivery reporting - no system capacity to update statuses and feedback to customers during project implementation	a. Frustrated customer base as there is no automated communication mechanism to provide customers with periodic updates	Impact markers across Municipal Operations, Budget and Treasury, Dev Planning, Infrastructure Dev, Corporate Services and Community services
		b. Outdated communication methods which are not aligned to technology and communication trends, example, newsletters, handwritten petitions	
		c. Outdated petition management procedure which leads to exclusion of majority of customers as information is 'managed' by Councillors	
		d. The lack of an e-book for Traffic Dept affects revenue management - currently there is reliance on physical books which can easily get lost - delays Stationary procurement affects operations for the Traffic department	
6	Multiple handovers to do simple ICT things (help desk related)	a. Inconsistent help desk processes for employees to get ICT help	
		b. Inability for ICT to resovle complaints 1st time, the right way	
		c. Due to poor help dek and intra-campus communication, employees clog the reception line to request information - when the lines must be left for customers/ stakeholders to contact the municipality	
		d. Due to lack of fully automated help-desk system, there is no MI (management information) to provide Executive Management with a snapshot of ICT performance	
		e. Poor ICT performance management reports/ MI (management information) to influence procurement decisions and budgeting	
		f. The municipality has not documented ICT Service strategy thus affecting Help desk operations and user expectations	

Impacted municipal areas column groups and headers:

- **Municipal Operations:** IDP, Public Participation, Communication, Council support, SPU
- **Budget and Treasury:** Revenue Mgt, Budgeting, Supply Chain, Asset Management, Expenditure Management, Customer Care
- **LED**
- **Dev Planning:** Town planning, Building, Human Settlements
- **Infrastructure Dev:** PMU, Mechanical, Electrical, Roads
- **Corporate Services:** Human Resource Dev, Labour relations, Facilities, ICT, Records
- **Community services:** Traffic, Licensing, Disaster Mgt, Security services, Community Facilities, Parks, Cemeties and Gardens

Legend:

High Impact	Medium Impact	Low impact	None
●	◍	◌	·

Table 6 of 8: MLM ICT detailed problem definition

Impacted municipal areas

No	Problem Statement	Scenarios	Municipal Operations					Budget and Treasury						Dev Planning				Infrastructure Dev				Corporate Services								Community services		
			IDP	Public Participation	Communication	Council support	SPU	Revenue Mgt	Budgeting	Supply Chain	Asset Management	Expenditure Management	Customer Care	LED	Town planning	Building	Human Settlements	PMU	Mechanical	Electrical	Roads	Human Resource Dev	Labour relations	Facilities	ICT	Records	Traffic	Licensing	Disaster Mgt	Security services	Community Facilities	Parks, Cemeties and Gardens
7	Poor ICT Infrastructure	a. Inconsistent network connection for sites such as Willovale, Elliotdale	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		b. Inadequate network connection points in off-site offices																														
		c. The municipality is not using unified communication solution - leading to high communication costs, lack internal communication capability																														
		d. Poor VPN infrastructure affecting working from home (WFH); inability to work from home increasing operational costs as employees will always have to drive to sites with connectivity to get work done																														
		e. Poor wifi signal leading to overreliance on network cables/ points - noting that some offsite offices do not have adequate network points example, Dutywa Townhall																														
		f. Some sites are not connected to the network example, Dutywa Pound employees have no access to telephones and emails																														
		g. Elliotdale and Willowvale employees have intermittent network access - due to power outages at high sites which affect network availability																														
		h. Unstable network connection in other Dutywa buildings affecting productivity of employees																														
		i. Network cabinets have dedicated power; they do not share with office plugs to avoid network outages																														
		j. Repuational risks as customers do not get responses on time from the municipality																														

Legend

● High Impact	● Medium Impact	● Low Impact	None

Table 7 of 8: MLM ICT detailed problem definition

No	Problem Statement	Scenarios	Impacted municipal areas
8	ICT user related assets	a. ICT asset procurement not aligned to employee recruitment leading to employees staying for long without tools of trade (example, Internal Audit team + Human Settlements using old laptops etc) b. Generally, there is delays in procuring ICT assets which affects productivity c. For off-site users, printing is a challenge, example Elliotdale due to power standard/ voltage in most of the buildings of the municipality d. ICT Asset disposal processes not fully implemented hence employees are still using aged laptops/ desktops e. ICT Assets are not traceable especially when they are not being used consistently; leads to difficulty in accounting for these unused laptops	Impacts across all municipal areas (Municipal Operations, Budget and Treasury, Dev Planning, Infrastructure Dev, Corporate Services, Community services)
9	Document management processes	a. Lack of automation in the records management unit may lead to regulatory non-compliance (POPI Act) in relation to document storage b. Municipality exposed to identify theft risks due to manual records storage - no encryption and no digital storage c. Inability for on-site scanning of documents/ digital submission during Free Basic registration poses a threat - as it increase volumes of documents to be stored by the municipality d. Disposal of records is not implemented due to lack of industrial disposal tools. This leads to non-compliance to enviromental factors	Impacts across all municipal areas (Municipal Operations, Budget and Treasury, Dev Planning, Infrastructure Dev, Corporate Services, Community services)

Impacted municipal areas (column headers):

- **Municipal Operations:** IDP, Public Participation, Communication, Council support, SPU
- **Budget and Treasury:** Revenue Mgt, Budgeting, Supply Chain, Asset Management, Expenditure Management, Customer Care
- **Dev Planning:** LED, Town planning, Building, Human Settlements
- **Infrastructure Dev:** PMU, Mechanical, Electrical, Roads
- **Corporate Services:** Human Resource Dev, Labour relations, Facilities, ICT, Records
- **Community Services:** Traffic, Licensing, Disaster Mgt, Security services, Community Facilities, Parks, Cemeteries and Gardens

Legend:

High Impact	Medium Impact	Low Impact	None

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Table 8 of 8: MLM ICT detailed problem definition

Impacted municipal areas

No	Problem Statement	Scenarios	Municipal Operations						Budget and Treasury						Dev Planning			Infrastructure Dev				Corporate Services					Community services					
			IDP	Public Participation	Communication	Council support	SPU	Revenue Mgt	Budgeting	Supply Chain	Asset Management	Expenditure Management	Customer Care	LED	Town planning	Building	Human Settlements	PMU	Mechanical	Electrical	Roads	Human Resource Dev	Labour relations	Facilities	ICT	Records	Traffic	Licencing	Disaster Mgt	Security services	Community Facilities	Parks, Cemeties and Gardens
10	Multiple, siloed, fragmented and unintegrated systems across the municipality	a. No integration of GIS system to the financial management systems to link products to the IDP and Project Management b. Automation of statements: the non-adoption of email functionality within the Revenue Mgt/ Customer Care unit leading to delayed communication with customers • lack of regular updates of customer details • over-reliance on Post Office to send statements to customers c. Inadequate training on the Mscoa system even for the ICT unit for ease of administration of the system to reduce call out costs of the Consultants d. Website: downtime due the absence of a valid hosting and maintenance SLA affecting SCM productivity as adverts cannot be published timeously and Communications unit on updating the website e. No review of security measures across ICT infrastructure (WAN/ LAN/ Servers) f. Stand alone server infrastructure – lack of virtualised and integration g. Consider a shared-services approach for the Internal Audit system with the District h. Self-service capability: the challenges with self service module in the HR system is affecting leave management (may lead to Audit issues) i. Security procedures: review the blocking of 3rd party emails as this is increase complaints due to delayed feedback j. Review workflow in the Sage (Finance system) - SCM module to allow for employees to vew status on all procurement stages (requests + declines)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

5.1 Summary of constraints

In summary, the customer constraints within MLM are as follows:

Management

a. Lack of real-time decision support reports/ dashboards
b. Current manual processes creating duplication of work for employees
c. Limited focus on strategic thinking as more time is dedicated to the development of reports which should be sourced from reports
d. Current public participation methods are limiting in assisting the municipality to manage customer expectations
e. Poor return on investment with regards to user-related technologies
f. No alignment of current communication methods with new technological trends
g. Lack of change management processes leading to slow transformation and performance improvement
h. Data/ information is not yet regarded as an asset.

Citizens

a. Over-reliance on municipal officials for access to information
b. No real-time updates on municipal performance and project related information especially for the general public
c. Limited direct access to the municipality
d. Poor communication has led to a perception of poor accountability and transparency
e. Citizens are not properly segmented to ensure effective and targeted communication
f. Free basic service delivery planning is not responsive as the registration process for indigents is cumbersome
g. Word of mouth communication potentially leading to transmission of incorrect information which may affect municipal initiatives

6. Analysis of ICT environment (AS-IS)

The main challenges as identified during the envisioning session are as follows:

1. Lack of ICT awareness in the municipality
2. Inconsistent and manual processes across the municipality
3. Lack of easily accessible real-time relevant data
4. Poor customer-centric focus leading to poor customer service due to lack of IT-enabled customer view
5. Lack of transparency in service delivery reporting - no system capacity to update statuses and feedback to customers during project implementation
6. Multiple handovers to do simple ICT things (help desk related)
7. Poor ICT infrastructure
8. Inadequate processes for managing ICT user-related assets
9. Document management processes
10. Multiple, siloed, fragmented and unintegrated systems across the municipality

Below is a highlight of some of the specific challenges in the municipality;

6.1 Current Business Architecture

From the analysis of the systems deployed within the municipality by business focus, the following conclusions can be made:

- There are limited systems which provide 'strategic' focus
- The majority of systems serve a 'transactional' purpose
- Transactional systems have been deployed to partly support the municipality's Enterprise Resources Planning requirements including financials, procurement, human resources and traffic management
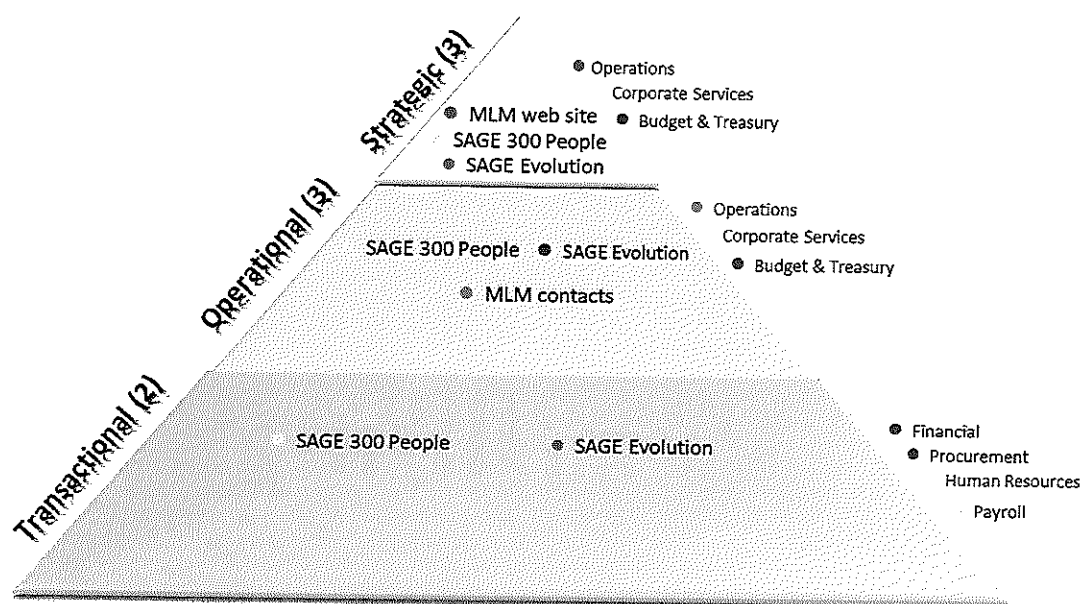
Figure 3: MLM systems alignment to management levels

An assessment of the business systems indicated that there is an inadequate alignment of the current systems to the business processes that are critical for the success of the municipality. There seem to be some system gaps when considering the operational requirements of the Community Services, Development and Planning, specifically in the areas of Tourism, Spatial planning, Cemetery management, Security management, Customer services, etc.

6.2 Current infrastructure deployment

The asset register shows that the following user-related assets have been deployed in the environment.

Table 2(a): Analysis of laptops/ CPUs

No	Item	Total	HP	Acer	Dell	Lenovo	Benq	Fian	Mecer	Huawei	Proline	Not specified
1	Laptops	173	125	1	3	1	-	-	-		-	43
2	CPUs	43	24	2	-	-	2	1	3	1	1	9

The state of the assets is shown below:

Table 2(b): Analysis of laptops/ CPUs

Item	Fair	Normal	Good	Condemn	Poor	Substantial Replacement
Laptops	3	18	127	19	5	1
CPUs	1	1	19	16	6	-

For printers, the following types of printers were deployed in the municipality:

Table 3(a): Analysis of printers

No	Item	Total	HP	Nashua	Epson	Canon	Pixma	Station Expert	Lexmark	Not specified
1	Printers	94	6	1	1	2	1	1	1	81

The condition of the printers is shown below:

Table 3(b): Analysis of printers

Item	Fair	Normal	Good	Condemn	Poor	Partial replacement
Printers	7	20	13	43	10	1

The following can be concluded with regards to the user related hardware:

- Generally, there needs to be an improvement in the asset disposal processes within the municipality as some assets are beyond their life span
  - 63 of the printers/ scanners are more than 10 years old, thus they are beyond their life span of 4 years
  - 51 laptops were purchased in 2014 or before, indicating that they are past their life-span
- It can be assumed that hardware standardization has not been fully implemented in the municipality hence there are various models of laptops deployed
  - It is highly possible that due to poor asset management practices, the non-HP laptops/ CPUs may be beyond their life cycle
- Inadequate classification and differentiation of printers was noted in the asset register – as document centres were also noted under 'printers'
- Asset management procedures are poor as the 81 printers have a 'not specified' type in the asset register
- Asset disposal procedures are not adhered to as assets which are not in a good condition are still included in the asset register
- It can be concluded that the actual number of usable assets (assets in a *fair, good* and *normal* condition) are as follows:
  - Laptops = 148
  - CPUs = 21
  - Printers = 40

The current infrastructure demand and supply is as follows:

Table 4: Current ICT Infrastructure distribution

| No	Category	Dutywa Main building	New Community Services (Tesko)	Dutywa Town Hall (Community Services)	Customer Care	Dutywa TRC	Dutywa Workshop	Willowvale	Elliotdale	Dutywa Pound
1	Computer users	90	7	12	10	11	7	5	15	0
2	# of buildings	4	1	3	1	1	2	2	2	1
3	Current connection type	MPLS (main building) 3 parkhomes wireless	MPLS	Wireless to Customer care	MPLS	Wireless to Main Building Dutywa	MPLS and Fibre	MPLS and Fibre	MPLS and Wireless	No connection
4	Approx # of network points	149	9	20	20	18	13	28	21	12
5	# of buildings connected on the network	4	1	3	1	1	2	2	2	No connection
6	# of network printers	18	1	2	1	1	1	1	2	0
7	# of telephones per site	75	6	13	8	4	6	4	14	0

In summary, the current network topology is as follows:
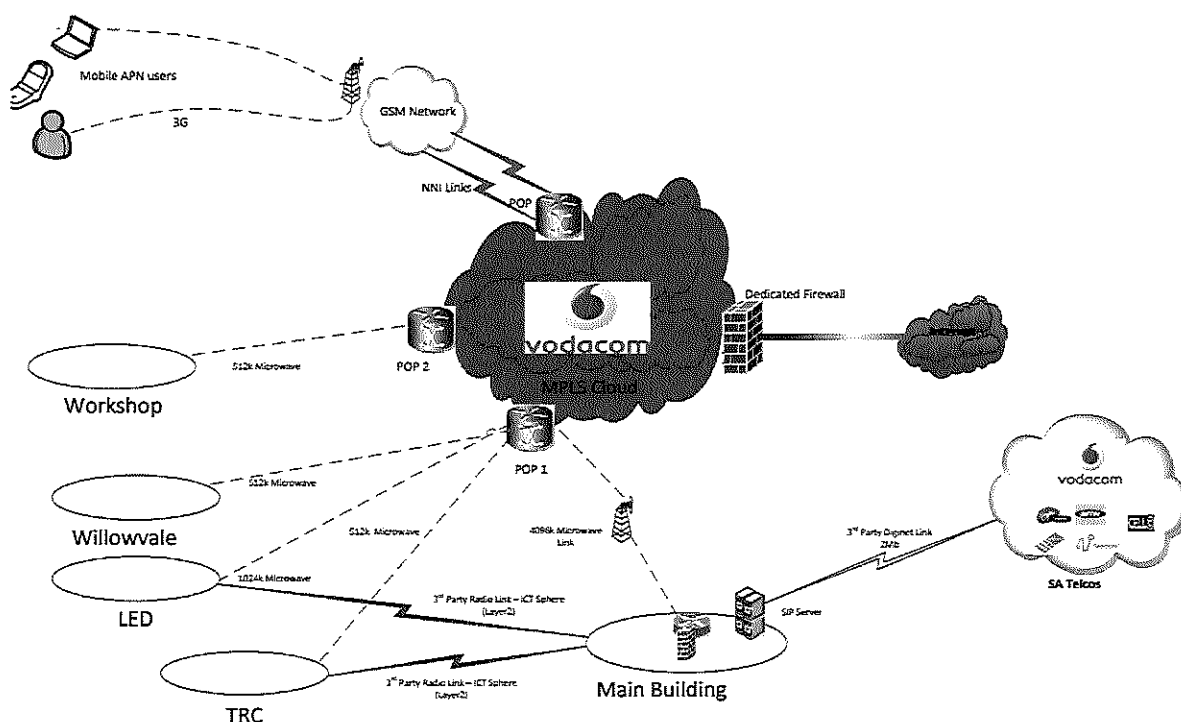
Figure 4: Current network distribution

7. Current ICT Total Cost of Ownership (TCO)

The total cost of ownership (TCO) is the purchase price of an asset plus the costs of operation. Assessing the total cost of ownership represents taking a bigger picture look at what the product is and what its value is over time.

The TCO is considered by organisations when they are looking to make investments in capital projects. Although these costs often are itemized separately on a company's financial statements, comprehensive analysis of the cost of ownership is a common practice for business dealings.

For the MLM, the TCO was calculated in the following dimensions:

a) User hardware (laptops, computers, printers, mobile phones etc)
b) Business applications/ systems
c) Management costs (ICT Planning, ICT Steering Committee expenses etc)
d) Infrastructure (network and processor related technology)

The 2017-2022 budget as per mScoa was used in this regard, to provide a few of the ICT related investments within the IDP cycle.

The following statistics were used in determining the TCO:

- Number of users: 121 (according to the AD register)
- Number of computers: 169 (according to the asset register)
- Number of employees: 323 (according to the Organogram)

7.1: TCO for User hardware

The methodology and assumptions applied for calculating the TCO are:

- The 2017-2022 budget was used to calculate TCO over 5 years instead of conventionally calculating TCO over a year
- It is acknowledged that the municipality uses the mSCOA accounting reporting principles, thus, the budget/ expenditure amounts have been reflected as taken from the municipal reports
- Costs relating to advertising tenders have been included as operational costs
- The operating component includes both budgeted and actual expenses
- The following assumptions have been made:
  - Life period for user-related technology = 3 years
- It is assumed that software costs include the cost of the anti-virus solution
- The costs for Mobile phones and 3G cards (Vodacom) was calculated by taking 1 month's invoice account over 12 months
- The telephone costs were calculated by using the monthly invoice from Amatola services over 12 months (this includes, rental, maintenance and voice usage)

Table 5: User hardware TCO

Item	Total Cost of Ownership			
	Capital component	Operating component	Total	%
Laptops + Desktops	R 2 076 250	incl	R 2 076 250	12%
Leased computer equipment	R 0	R 55 125	R 55 125	0%
Other leases	R 0	R 76 250	R 76 250	0%
Printers	R 0	R 7 305 000	R 7 305 000	41%
Mobile Phones + 3G cards	R 0	R 7 698 204	R 7 698 204	43%
Telephone expenses	R 0	R 701 498	R 701 498	4%
TOTAL User related technology	R 2 076 250	R 15 836 077	R 17 912 327	

7.2: TCO for Business applications

The methodology and assumptions applied for calculating the Business applications TCO is:

- The capital component of the Business applications was determined by assessing the capital cost of the information systems which have been deployed and annualizing such over the expected life period of the information system. Where information systems, exceed the life period, the capital component is therefore zero
- The Business applications operating component consists of license and maintenance fees.
- The staff costs relating to the administration of the municipality's Business applications are excluded
- Costs relating to the consultants' fees by 3rd party providers are included as operational costs – where applicable

Table 6: Business applications TCO

Item	Total Cost of Ownership			
	Capital component	Operating component	Total	%
MLM Website	R 0	R 206 100	R 206 100	4%
Traffic management system	R 750 000	R 440 000	R 1 190 000	21%
ICT licence renewals	R 0	R 4 174 025	R 4 174 025	75%
TOTAL BusinessApplications	R 750 000	R 4 820 125	R 5 570 125	

7.3 TCO for Infrastructure

The methodology and assumptions applied for calculating the Infrastructure TCO are:

- The capital portion of the infrastructure TCO has been calculated by considering the replacement value of all what has been deployed and annualizing such over the expected life period of the infrastructure
- The operating portion of the TCO includes actual expenses related to hardware
- Where professional services providers were used to deliver ICT deliverables, example the maintenance of servers, the cost of such were included in the capital portion of the TCO with the life period equal to the typical review cycle of such a deliverable
- Life period for infrastructure = 5 years

Table 7: Infrastructure TCO

Item	Annualized Total Cost of Ownership			
	Capital component	Operating component	Total	%
Disaster recovery incl licences		R 12 365 750	R 12 365 750	62%
Network infrastructure	R 447 000	R 10 500	R 457 500	2%
Repair & Maintenance		R 533 272	R 533 272	3%
VoIP including licences		R 5 606 600	R 5 606 600	28%
Furniture and office equipment		R 861 000	R 861 000	4%
TOTAL Technology	R 447 000	R 19 377 122	R 19 824 122	

7.4 TCO for ICT management-related costs

The methodology and assumptions applied to calculate the Management related TCO are:

- The municipal budget was scrutinized to identify the operating and capital costs relating to the management of information infrastructure
- Capital items were discounted (annualized) over the expected life period of the infrastructure
- The cost of furniture for the ICT unit could not be easily determined

Table 8: Management TCO

Item	Annualized Total Cost of Ownership			
	Capital component	Operating component	Total	%
ICT Master Plan		R 610 000	R 610 000	100%
ICT Steering		R 0	R 0	0%
Other expenses		R 0	R 0	0%
TOTAL	R 0	R 610 000	R 610 000	

It is important to note that the TCO calculations above exclude management costs such as salaries, training, travelling etc as these might be ring-fenced in other municipal budgets.

7.5 Findings on Mbhashe LM ICT TCO

The analysis of the total MLM TCO indicates the following:

Table 9: Total MLM ICT TCO

Item	Annualized Total Cost of Ownership			
	Capital component	Operating component	Total	%
User technology	R 2 076 250	R 15 836 077	R 17 912 327	41%
Infrastructure	R 447 000	R 19 377 122	R 19 824 122	45%
Business Applications	R 750 000	R 4 820 125	R 5 570 125	13%
ICT Management	R 0	R 610 000	R 610 000	1%
TOTAL	R 3 273 250	R 40 643 324	R 43 916 574	

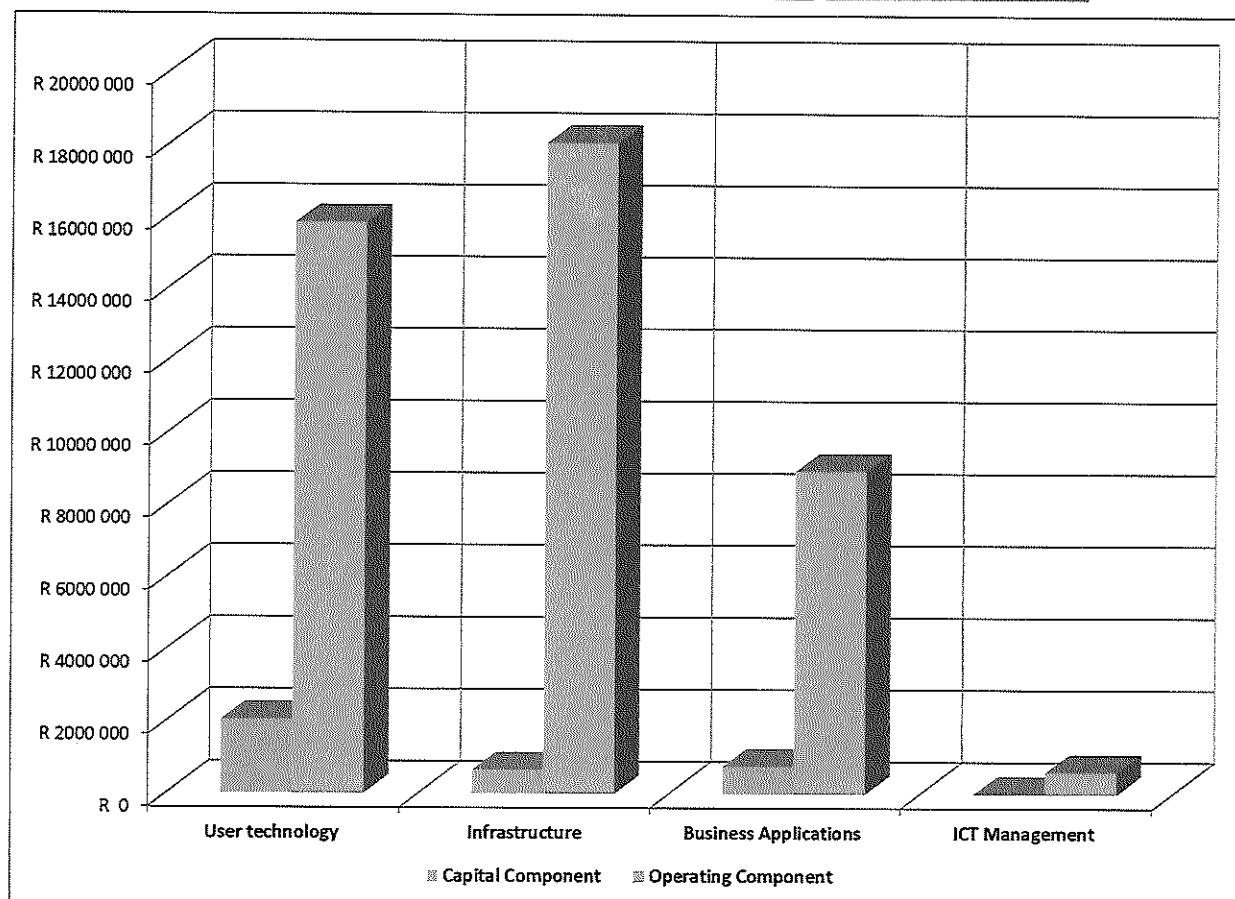The capital versus operational expenditure split is as follow:

Table 9 and the subsequent graph above shows that the municipality is spending approximately +/- R44 million over 5 years in ICT. A comparison of the capital and operational expenditure alludes to the fact that most of ICT expenditure is on operational issues. It can be assumed that the same budget applied to implement this ICT Master plan can result in extremely positive benefits and ICT value for the municipality.

8. Future ICT Architecture

The MLM Future ICT Enterprise Architecture is supposed to be aligned to information needs which support the business goals. In outlining the future architecture of MLM, below is a highlight of ICT principles and trends which will continue to shape the ICT vision and priorities of the municipality.

8.1 ICT Principles

The following principles will guide the MLM to ensure alignment between municipal objectives and the ICT Strategy:

Principle 1: ICT that is reliable

Principle 2: ICT that is predictable

Principle 3: ICT that is efficient

Principle 4: ICT that is secure

Principle 5: ICT that is flexible

Principle 6: ICT that is extensible and fosters innovation

Principle 7: ICT that is responsive and

Principle 8: ICT that is affordable and sustainable

8.2 ICT Future trends

The future of MLM's ICT adoption will be informed by current technology trends which are as follows:

- **Hardware standardization:** Standardizing equipment from a vendor that sells several products (from laptop to high-performance servers) allows an organisation to deal with one supplier, negotiate bulk discounts and establish a good working relationship. Standardization can also ease support problems because the support team doesn't have to troubleshoot multiple systems and makes training on the machines less complicated and time-consuming. The impact on end-users is also minimal if standardized equipment is easy to upgrade or replace which can save further time and expenses in end-user training and support. Finally, standardization also makes it easier to track software licenses both on the premises and from the vendor.

- **Operating system standardization:** Most of the benefits from hardware standardization above apply to software standardization with the further benefit of rapid upgrades and rollouts and standardized training for end-users.

- **Remote desktop management/centralized administration** Administrators manage the desktop environment and address user concerns and issues, without having to be on-site, resulting in the reduction of costs associated with typical administrative and support tasks.

- **Mobile computing:** Mobile Computing is a modified and new way of interacting with the computer device and to facilitate the other computing capabilities being present at different mobile locations. Mobile computing has three aspects: mobile communication, mobile hardware, and mobile software. The first aspect addresses communication issues in ad-hoc and infrastructure networks as well as communication properties, protocols, data formats and concrete technologies. The second aspect is on the hardware, e.g., mobile devices or device components. The third aspect deals with the characteristics and requirements of mobile applications. (Wikipedia)

- **Unified communications:** (UC) is the integration of real-time communication services such as instant messaging, presence information, telephony (including IP telephony), video conferencing, data sharing, call control and speech recognition with non-real-time communication services such as unified messaging (integrated voicemail, e-mail, SMS and fax). UC allows an individual

to send a message on one medium and receive the same communication on another medium. For example, one can receive a voicemail message and choose to access it through e-mail or a cell phone. If the sender is online according to the presence information and currently accepts calls, the response can be sent immediately through text chat or video call. Otherwise, it may be sent as a non-real-time message that can be accessed through a variety of media. (Wikipedia) The convergence of information and communication technologies (ICT) has led to the integration of data, voice, graphics, and video into a digital environment. The convergence of an increasing range of communication technologies and applications is driving demand for new and innovative communications services that support business growth, communication, technology, and the media

- **Consumerization:** Consumerization is the name for the trend where employees use their own devices and consumer applications to conduct company business. These devices include smartphones, pads, and tablets with their external data plans – BYOD (Bring-your-Own-Device)

- **Electronic Paper:** Today, the portable wireless devices that allow you to download and read a newspaper or book, sometimes called eReaders, are convenient and can also help reduce the amount of paper we use. eReaders of the future will be paper-thin, flexible and have wireless connections. When not being used, large displays may roll-up or neatly fold away.

- **Touch Screens:** The popularity of smartphones, tablet computers and many types of information appliances is driving the demand and acceptance of common touchscreens for portable and functional electronics. With a display of a simple smooth surface and direct interaction without any hardware (keyboard or mouse) between the user and content, fewer accessories are required. (Wikipedia)

- **Wireless Devices:** The use of wireless devices and wireless telecommunications to transfer information over both short- and long distances.

- **Smartphones:** For several years, demand for advanced mobile devices boasting powerful processors and graphics processing units, abundant storage for applications and media files, high-resolution screens with multi-touch capability, and open operating systems has outpaced the rest of the mobile phone market. According to PEW Research Center in their report dated October 2018, 91% of South Africans own a mobile phone and 51% own a smartphone. Growth of smartphone market share is expected to continue to grow.

- **Greener Gadgets:** The Future Technology Predictions trend will be creating greener gadgets and eco-friendly products. People are becoming inclined toward protecting the environment and nature and using environment-friendly gadgets. Using gadgets that take up less energy is the trend for new gadgets. Solar power is the most used source of energy as it is free to consume and are not dangerous for the environment.

- **Affordable, simplified ERP:** While many ERP systems are deeply entrenched in organizations, and their core technologies are mature, ERP is in a state of flux. The ERP of the future promises to be simplified, more accessible and easier to use, shaped by trends that began taking hold this year. (inside-ERP).

- **Software-as-a-Service (SaaS):** or "on-demand software" is a delivery model in which software and associated data are centrally hosted in the cloud and is typically accessed by users using a thin client via a web browser. As the accessibility to IT resources decline, it is proposed that the municipality will increasingly use the SaaS delivery model.

- **Open Source Software (OSS):** OSS is typically developed through public collaboration, it is available to anyone (usually at little or no cost), it does not require proprietary license fees and it may be freely re-distributed. OSS is, therefore, a trend that cannot be ignored and will have a significant impact on the deployment of ICT in South African Public Sector.

- **Remote Sensing** is the acquisition of information about an object or phenomenon, without making physical contact with the object. It is proposed that service delivery efficiency will demand higher utilization of remote sensing capabilities.

- **Smart metering:** the improved availability and affordability of technology to provide smart metering solutions will increase dramatically over the next two years.

- **Electronic billing:** Increasing acceptance of e-billing by consumers and the business community (according to *Kiplinger* magazine, 77% of business owners now favour electronic billing), as well as increased concern for security and the environment, is speeding up the shift to electronic billing from paper billing. (Wikipedia)

- **Electronic document and records management, seamlessly integrated as part of the Business Productivity Infrastructure:** Smart enterprises will capitalise on tools that allow them to fully integrate electronic communication and messaging solutions that have the added benefit of being stored in a single repository. The seamlessness of the integration and the original intention of the records-management component to manage electronic records typically sets the complexity of deploying and potentially of using the final system. (Wikipedia) The focus is now on the establishment of Business Productivity Infrastructure (BPI) to provide people with the ability to seamlessly view and edit information from a PC, browser and smartphone. The focus is towards greater automation of metadata capture and streamlined access to document libraries directly from the user's office applications as opposed to the establishment of stand-alone document and electronic records management systems. Mobile access requirements have further changed the traditional document and records management environment.

- **E-mail** as the workflow engine is seamlessly integrated into the business productivity- and document management environment and is managed in the same way as normal office documents as part of the document- and records management solution.

- **Modular applications (modular programming):** Modular programming (also known as top-down design and stepwise refinement) is a software design technique that increases the extent to which software is composed of separate, interchangeable components called modules by breaking down program functions into modules, each of which accomplishes one function and contains everything necessary to accomplish this. This makes modular designed systems if built correctly, far more reusable than a traditional monolithic design, since all (or many) of these modules may then be reused (without change) in other projects. Several programmers can work on individual programs at the same time, thus, making the development of programs faster. It is easier to debug, update and modify. It leads to a structured approach as a complex problem can be broken into simpler tasks. This strategy of developing a program is, therefore, very advantageous (Wikipedia) and hence becoming increasingly popular in the software development environment.

- **Blade servers:** Technology has advanced significantly since the first floor-mounted servers. One can now get 34 servers in the same space as a traditional rack-mounted server. Consolidating, and standardising servers into a blade enclosure, improves the management, scalability, and reliability.

- **Storage Area Networks (SAN):** A SAN can provide consolidated storage for multiple servers on different platforms. This allows an easy to manage and backup high-performance disk-array with built-in redundancy.

- **Server consolidation and virtualization:** Virtualization can be viewed as part of an overall trend in enterprise IT that includes automatic computing, a scenario in which the IT environment will be able to manage itself based on perceived activity, and utility computing, in which computer processing power is seen as a utility that clients can pay for only as needed. The usual goal of virtualization is to centralize administrative tasks while improving scalability and overall hardware-resource utilization. With virtualization, several operating systems can be run in parallel on a single central processing unit (CPU). This parallelism tends to reduce overhead costs and differs from multitasking, which involves running several programs on the same OS. (Wikipedia)

- **Containerized data centres:** a dramatic shift is taking place in the makeup of the physical data centre. The rise of modular containerized compute environments stands to remake the IT industry from the ground up, literally. Its impact is likely to be felt in everything from the design and development of physical resources to power and cooling technologies and even application structures and environments. Modular technology has the appeal of being easy to deploy, cost and energy-efficient and easier to manage and maintain. As more and more enterprises look to boost their infrastructure for private clouds and other functions, adding a few containers in the back lot starts to look much more appealing than a completely new building. (IT Business Edge Blog by Arthur Cole)

- **Cloud computing:** Cloud computing is achieving increased popularity, however concerns are being voiced about the security issues introduced through the adoptions of this new model. Cloud computing providers offer their services according to three fundamental models: Infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) where IaaS is the most basic and each higher model abstracts from the details of the lower models

- **Municipal broadband:** .... broadband internet access services provided either fully or partially by local governments. Common connection technologies include unlicensed wireless, licensed wireless (such as WiMAX) and fibre-optic. Major cities such as Cape Town, Durban, Johannesburg and Pretoria have launched public-private initiatives to build their broadband networks to provide cheaper voice and data services for internal use. While there are multiple network structures capable of supporting broadband services, an ever-increasing percentage of broadband and MSO providers are opting for fibre optic network structures to support both present and future bandwidth requirements.

- **Collaboration technologies and convergence:** The convergence of an increasing range of communication technologies and applications is driving demand for new and innovative communications services that support business growth, communication, technology, and the media. New collaboration technologies include features such as video and data conferencing, voice over IP (VOIP), instant messaging, streamlined routing protocols, more redundant routing in the organization, and synchronous event sinks. It is desirable to have a single network for providing all communication services in order to achieve the economy of sharing. This economy motivates the general idea of an integrated services network. Integration avoids the need for many overlaying networks, which complicates network management and reduces flexibility in the

introduction and evolution of services. This integration is made possible with advances in broadband technologies and high-speed information processing. (Wikipedia)

- **VOIP/Mobile VOIP:** Because of the bandwidth efficiency and low costs that VoIP technology can provide, businesses are migrating from traditional copper-wire telephone systems to VoIP systems to reduce their monthly phone costs. VoIP allows both voice and data communications to be run over a single network, which can significantly reduce infrastructure costs. VoIP devices have simple, intuitive user interfaces, so users can often make simple system configuration changes. Dual-mode phones enable users to continue their conversations as they move between an outside cellular service and an internal Wi-Fi network so that it is no longer necessary to carry both a desktop phone and a mobile phone. Maintenance becomes simpler as there are fewer devices to oversee. Mobile VoIP users were recorded to be to over 1 billion users by 2017. Most innovations in mobile VoIP will likely come from campus and corporate networks. (Wikipedia)

- **Managing the Total Cost of Ownership (TCO):** TCO analysis was popularized by the Gartner Group in 1987. The roots of this concept date at least back to the first quarter of the twentieth century. Many different methodologies and software tools have been developed to analyze TCO. TCO tries to quantify the financial impact of deploying an information technology product over its life cycle. These technologies include software, hardware and training.

- **Service Level Agreement (SLA) Management:** Internal departments (such as IT, HR, and real estate) in larger organizations have adopted the idea of using service-level agreements with their "internal" customers — users in other departments within the same organization. One benefit of this can be to enable the quality of service to be benchmarked with that agreed to across multiple locations or between different business units. This internal benchmarking can also be used to market test and provide a value comparison between an in-house department and an external service provider. (Wikipedia) Any SLA management strategy considers two well-differentiated phases: the negotiation of the contract and the monitoring of its fulfilment in real-time. Thus, SLA Management encompasses the SLA contract definition: basic schema with the QoS (quality of service) parameters; SLA negotiation; SLA monitoring; and SLA enforcement—according to defined policies. (Wikipedia)

- **E-Learning:** Nowadays, it is commonly thought that new technologies can strongly help in education. E-Learning has now been adopted and used by various companies to inform & educate both their employees and customers. Social networks have become an important part of E-learning. There is a trend to move towards blended learning services, where computer-based activities are integrated with practical or classroom-based situations.

- **Sourcing:** As the demand for ICT skills expand, many organizations have entered into sourcing arrangements for specialist components of their ICT environments, example City of Tshwane has outsourced its help desk, network management, etc.

8. 3 Proposed ICT Architecture

Therefore, having these trends in mind, MLM ICT architecture is proposed as follows:
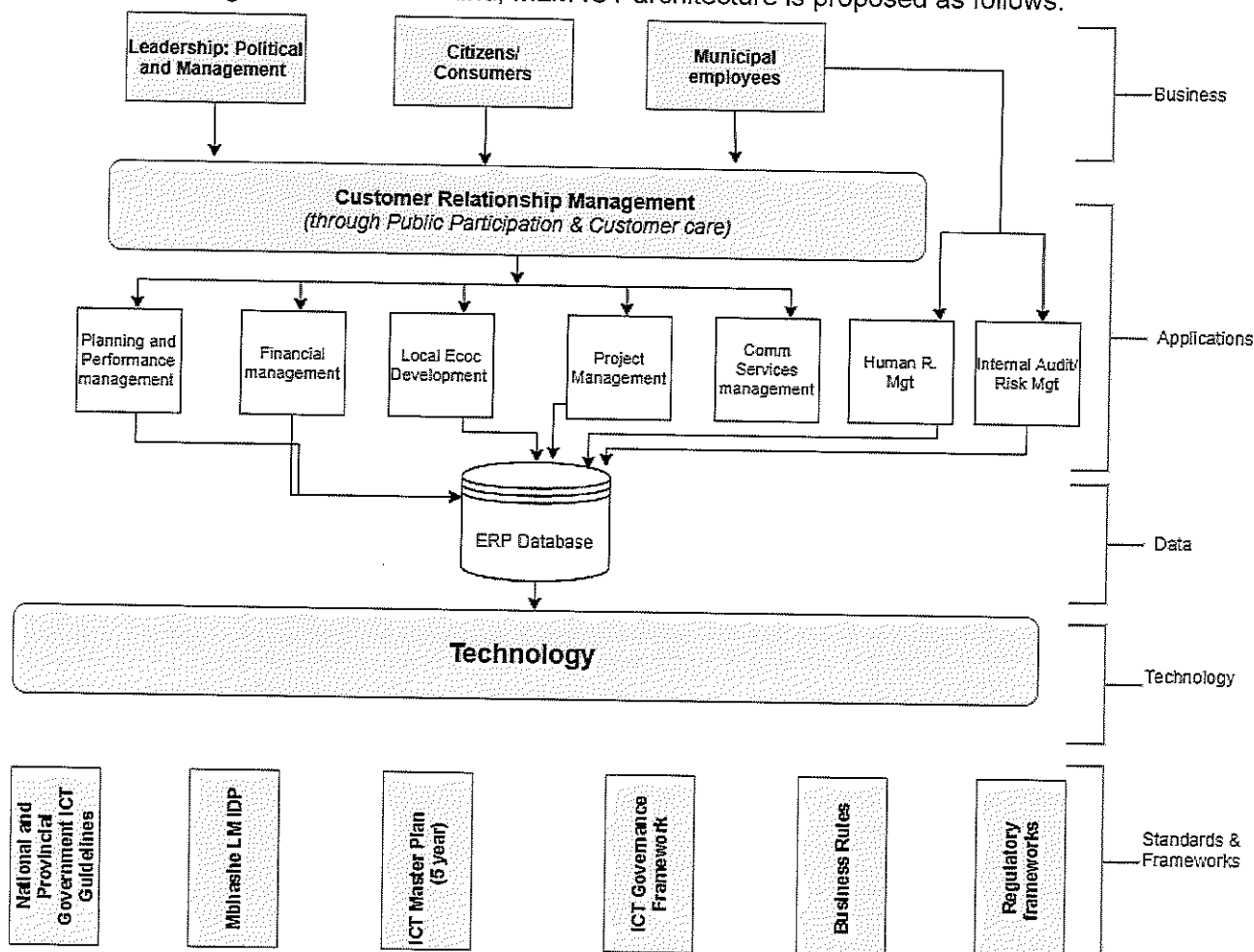
Source: ICT Choice - **Figure 5: Proposed ICT architecture overview**

Figure 5 outlines the importance of customer relationship management as the base for the business architecture within MLM. The ability to source customer complaints and queries in real-time will improve communication with customers and reduce service delivery unrests.

The figure suggests that politicians, management, customers and internal users must consistently interface with the customer relationship management, also referred to in this document as a community engagement solution. This constant interface will empower the municipal leadership with information and knowledge relating to the needs of its citizens. Also, this will reduce the manipulation of customer queries, and reduce the frustration caused by slow feedback mechanisms from the municipality to communities.

This ICT EA seeks to empower even Ward Councillors who are the 1st line of help for citizens by ensuring that municipal tools of trade such smartphones enable them to log-in queries and requests in real-time and to monitor the resolution of such, in the comfort of their ward offices. The CRM will pull information from functions which are used to service customers directly such as:

a) IDP and Development and planning units
b) Revenue management unit
c) Local economic development units
d) Project management unit
e) Community services units

These units have been identified to be exposed to citizens more than others. Therefore, the adoption of a CRM will enable proactive planning, communication and reporting to all stakeholders by these units. Besides, a CRM system will empower the Operations Management unit with information that may affect Public Participation processes and other political processes which are critical for the efficient operation of a municipality.

In addition to this overview, the MLM desired integration flow is as follows:
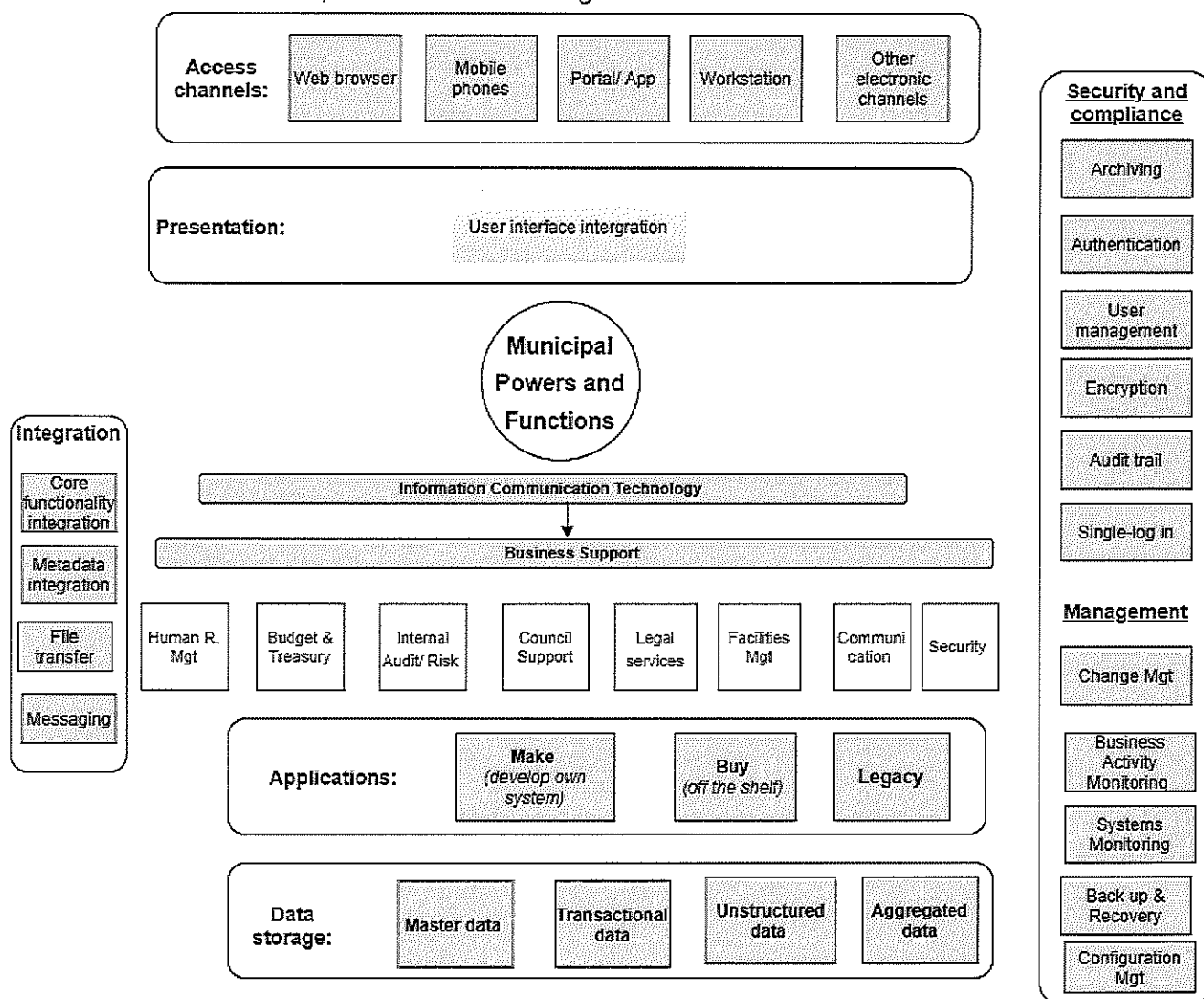
Source: ICT Choice - **Figure 6: MLM desired EA decomposition**

This decomposition highlights the importance of a holistic approach to ICT planning. While system acquisition is usually conducted as a stand-alone action, Figure 6 highlights the importance of the following functions:

- Security and compliance functions to ensure that municipal data is archived, encrypted to protect data privacy and to secure the data that an audit trail is created and users are provided with a single-log into the municipal systems.
- Management of ICT infrastructure which entails change management to ensure that there is continuous transformation and adherence to standards and procedures, business activity monitoring is achieved to allow for ICT to enable the achievement of business goals, systems monitoring to ensure that systems are not down when they are expected to be working and back-up and recovery of data is assured;
- Integration of systems and databases entails core systems within the municipality are integrated and there is the capability to draw business intelligence from municipal data; to ensure that file transfer within systems is seamless and to enable messaging from one system to another.

8.4 Proposed network diagram

The diagram below shows the proposed network distribution for the municipality.
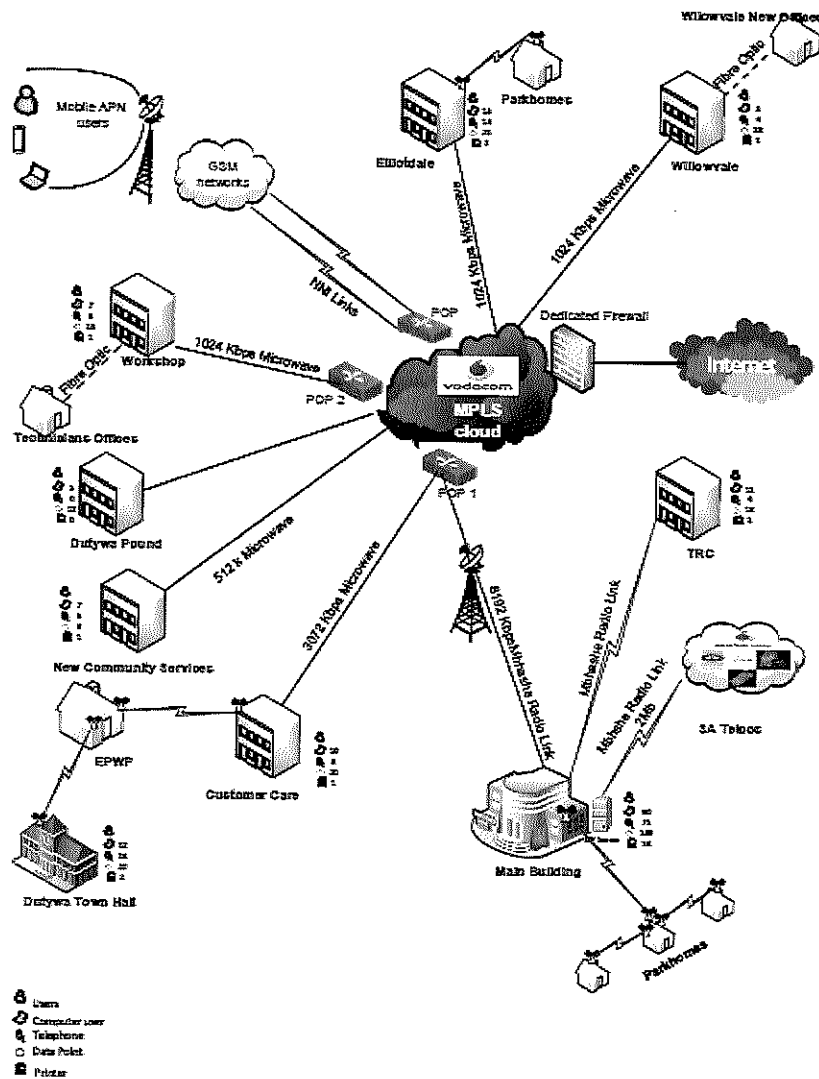
Figure 7: Proposed network diagram

The proposed architecture view as articulated in Figure 5, 6 and 7 respond to the challenges and constraints identified in the envisioning workshop – as articulated in the master plan.

9. ICT Implementation plan (2020/21 – 2024/25)

The proposed implementation framework comprises a three-thrust implementation process to provide "Fix-IT", "Standardize-IT" and "Revolutionize-IT" solutions as schematically depicted in Figure 7 on the next page. Although the framework is based on a five-year planning horizon, it is not a discrete process that terminates at the end of five years. Instead, it is designed to be implemented and then re-evaluated each year to ensure the business model and technology alignment. By constantly updating the ICT EA, the planning process will dynamically slide forward each year. In this manner, the ICT Master Plan implementation action plans will continue to support high-level ICT goals and objectives without becoming obsolete.

The three-thrust comprising the macro strategy may be defined as follows:

"Fix-IT"

- identifies major problem areas or activities that can be addressed quickly to provide the most value in the least amount of time. However, the approach taken in this thrust differs from traditional 'opportunistic' quick fixes in that it identifies and segregates problems within the context of an overarching three-thrust macro strategy. To ensure that the proper problems are addressed and solved in the "Fix-IT" thrust, the overall impact of these solutions must be analyzed to understand their impact on the "Standardize-IT" and "Revolutionize-IT" thrusts. Furthermore, the costs associated with the "Fix-IT" solutions must be synchronized with the municipality's funding process to ensure that the "Standardize-IT" and "Revolutionize-IT" thrusts are not detrimentally affected.

"Standardize-IT"

- planning extends one year beyond the "Fix-IT" for a total period of two years. Emphasises is on the development of a common infrastructure and operating environment and requires standards to be identified and implemented to ensure a smooth transition to a consolidated operating environment that is completely integrated, seamless and reliable. The standardization process must be based on best practice and will result in optimized interoperability, data access, operational efficiency, and information access and service reliability at lower costs.

"Revolutionize-IT"

- projects in this category are implemented over three years and are focused on employing 'Leap Ahead' technologies that will provide a major impact on the municipality's business model. The main drivers of the "Revolutionize-IT" are increased efficiency and cost savings. The impact of the "Revolutionize-IT" technologies and solutions will strategically position the municipality to achieve maximum benefits to both its users and customers alike. This process will also reduce the frequency of major systems changes.

Continuous process of Implementation Planning Re-Evaluation

Fix-IT Standardise-IT Revolutionize-IT

1 year
2 years
3 years
4 years
5 years

July 2020   July 2021   July 2022   July 2023   July 2024   July 2025
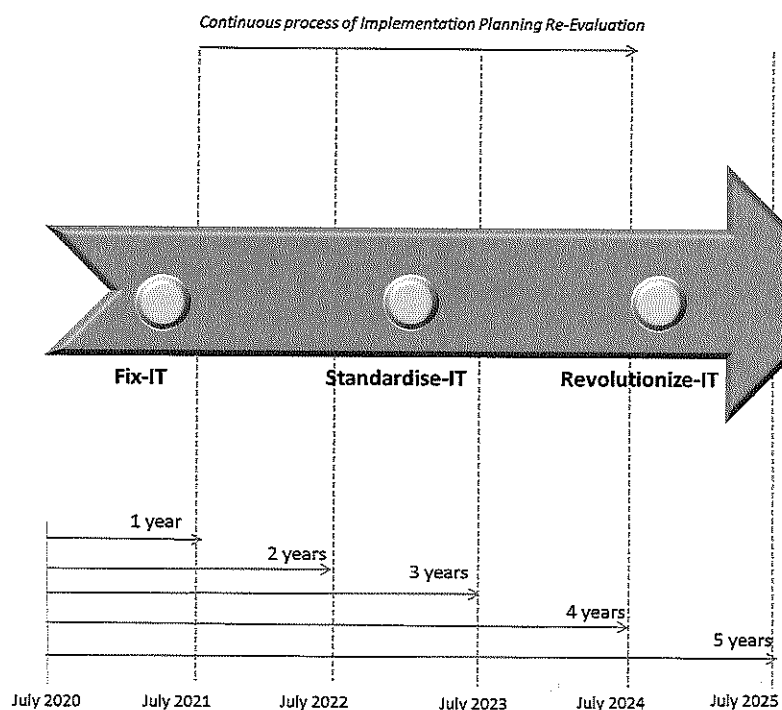
Figure 8: MLM ICT Implementation framework

The generic implementation framework for each Strategic Action Plan should provide for:

- Confirmation of the problem area or business requirement
- Confirmation of the costs
- Quantification of the Total Cost of Ownership (Return on Investment)
- Confirmation of the timeline
- Refinement of the tasks
- Assignment of the resources (budget and staff)
- Monitoring of the progress
- Reporting of progress and performance
- Confirmation of value addition and strategic alignment

The strategic action plans are listed below.

9.1 Strategic Action plans for Application Architecture

The identified strategic action plans for application architecture are as follows;

Table 10a: Strategic actions for Application Architecture (part a)

Action #	Plan Name	Dependence	Fix-IT	Standardize-IT	Revolutionize-IT	FY2020/21	FY2021/22	FY2022/23	FY2023/24	FY2024/25	TOTAL
AA-1	Map all business processes to document workflows and procedures to ensure effective customer service (even if full automation is not achieved)				●	R 0	R 450,000	R 0	R 0	R 0	R 450,000
AA-2	Procure a community engagement solution which is accessible through basic mobile phones, including smart phones - such should also be used in the Customer Care centre with provision for dashboard screens in the following offices: * Mayor * Speaker's office * Municipal Manager's office * Customer care centre/ Communications				●	R 0	R 750,000	R 225,000	R 247,500	R 272,250	R 1,494,750
AA-3	Procure a system which provides support for Tourism and LED business process - the system should be compatible to the financial management system	AA-1			●	R 0	R 0	R 585,000	R 67,500	R 67,500	R 720,000
AA-4	Procure a project management system (module) which is compatible with financial reporting system.	AA-1			●	R 0	R 450,000	R 135,000	R 67,500	R 67,500	R 720,000
AA-5	Procure a system which provides support for Cemetry management, Community services - the system should be compatible to the financial management system	AA-1			●	R 0	R 450,000	R 135,000	R 67,500	R 67,500	R 720,000
AA-6	Integrate ArcGis system to SAGE Evolutioon, to enable Performance management and project reporting ensure real time reporting to stakeholders; such a system is to be linked to ArcGIS (SAGE is compatible with ArcGIS)	AA-1	●			R 0	R 0	R 500,000	R 50,000	R 50,000	R 600,000
AA-7	Ensure that the community engagement / customer care solution has modules which can be used in project beneficiary administration to improve MLM's administration of functions executed by other governemtns stakeholders	AA-2			●	R 0	R 380,000	R 0	R 0	R 0	R 380,000

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Table 11: Strategic actions for Application Architecture (part b)

Action #	Plan Name	Dependence	Fix-IT	Standardize-IT	Revolutionize-IT	FY2020/21	FY2021/22	FY2022/23	FY2023/24	FY2024/25	TOTAL
AA-8	Introduce and enforce automated time and attendance; such a system must be integrated to the HR and Payroll system - *(consider activating the SAGE module for this)*			●		R 0	R 750,000	R 50,000	R 50,000	R 0	R 850,000
AA-9	Procure help desk system to improve ICT Help Desk function and management of ICT assets	AA-1	●			R 0	R 0	R 250,000	R 50,000	R 50,000	R 350,000
AA-10	Procure a call centre system to ensure that consumers are given quality service, consistently				●	R 0	R 1,500,000	R 250,000	R 250,000	R 250,000	R 2,250,000
AA-11	Procure livestock for effective tracking to ensure effective management of Pound stock - considering that the tracking system must be integrated with the municipal financial management system *(consider procuring Enterprise Asset Management module instead of the standard module that is currently inuse)*	AA-3			●	R 0	R 0	R 350,000	R 50,000	R 0	R 400,000
AA-12	Implement disaster recovery plan and business continuity for core transactional systems as part of a fully redundant virtuallised server environment			●		R 4,000,000	R 3,000,000	R 2,250,000	R 600,000	R 600,000	R 10,450,000
AA-13	Provide for key systems user training (including refresher training) - by enforcing current SLAs	AA-9	●			R 0	R 0	R 0	R 0	R 0	R 0
AA-14	Procure additional licences were necessary to ensure access to information for all key users	AA-9	●			R 50,000	R 50,000	R 50,000	R 50,000	R 50,000	R 250,000
AA-15	Improve the website 1. to have intranet capability to assist in internal communication 2. to be a marketing tool for local economic activities and groupings - ensuring that the website is optimised and such reports are analysed to support management actions		●			R 0	R 0	R 0	R 0	R 500,000	R 500,000
AA-16	Review the following strategies, Communication, Public Participation to 1. alignment with current communication trends and proliferation of cellphones within the Mbhashe community 2. to make provision for usage of mobile enabled community engagement tools (apps etc)	AA-2		●		R 0	R 500,000	R 500,000	R 0	R 0	R 1,000,000
AA-17	Invest in work stations to be used in Ward offices as Kiosk's for real time capturing of citizens concerns, In support of Public participation, SPU, Free Basic services and Customer Care processes	AA-2			●	R 0	R 0	R 250,000	R 0	R 0	R 250,000
	TOTAL					R 4,050,000	R 8,280,000	R 5,530,000	R 1,550,000	R 1,974,750	R 21,384,750

9.2 Strategic action plans for Business Architecture

Table 12: Strategic action plans for Business Architecture

Action #	Plan Name	Dependence	Fix-IT	Standardize-IT	Revolutionize-IT	FY2020/21	FY2021/22	FY2022/23	FY2023/24	FY2024/25	TOTAL
BA-1	Improved ICT budget planning to address all business needs and priorities identified in the ICT Master Plan		●			R 0	R 0	R 0	R 0	R 0	R 0
BA-2	Review the IT unit structure and resourcing to ensure all ICT portfolios are adequately addressed		●			R 0	R 0	R 0	R 0	R 0	R 0
BA-3	Determine the user training needs, budget and implement - aligning these to the 4th Industrial Revolution trends in local government (4IR) - ensure municipal-wide engagement to raise awareness on ICT, its relation to business and potential benefits from ICT investments 1. COBIT 2. Security training 3. ISO Standards 4. ITIL 5. PMP Project Management			●		R 0	R 195,000	R 0	R 0	R 0	R 195,000
BA-4	Ensure effective change management in the implementation of Customer Care and Public participation policies to create a customer centric culture with MLM				●	R 0	R 0	R 0	R 0	R 0	R 0
BA-5	Institutionalise ManCo reports to include a standing monthly item on reports relating to Customer complaints/ queries etc				●	R 0	R 0	R 0	R 0	R 0	R 0
BA-6	Appoint an independent Chairperson for the ICT Steering Committee to ensure objective evaluation for the ICT performance				●	R 75,000	R 75,000	R 75,000	R 75,000	R 75,000	R 375,000
BA-7	Enforce the role for the ICT Steering committee's oversight function in the business systems procurement cycle to reduce misalignment procurement			●		R 0	R 0	R 0	R 0	R 0	R 0
BA-8	Management to assist in enforcing ICT policies - as part of change management processes			●		R 0	R 0	R 0	R 0	R 0	R 0
BA-9	Ensure annual performance assessment- and review of the ICT Master Plan			●		R 0	R 0	R 0	R 0	R 0	R 0
	TOTAL					R 75,000	R 270,000	R 75,000	R 75,000	R 75,000	R 570,000

9.3 Strategic action plans for Technology Architecture

Table 13: Strategic action plans for Technology Architecture

Action #	Plan Name	Dependence	Fix-IT	Standardize-IT	Revolutionize-IT	FY2020/21	FY2021/22	FY2022/23	FY2023/24	FY2024/25	TOTAL
TA-1	Engage ISPs providing services in Mbhashe on network upgrades - ensure community leadership participation as well				●	R 500,000	R 0	R 0	R 0	R 0	R 500,000
TA-2	Review and restructure AD / Firewall / WSUS/ Anti-virus licences / File structuring that supports centralised and secure management of users (integrate systems / common structuring/ single log-in to systems)		●			R 200,000	R 200,000	R 0	R 0	R 0	R 400,000
TA-3	Skills transfer on security related issues		●			R 0	R 0	R 0	R 0	R 0	R 0
TA-4	Conferencing facilities for 3 sites - Dutywa, Willowvale and Elliotdale				●	R 500,000	R 100,000	R 100,000	R 100,000	R 100,000	R 900,000
TA-5	Provide infrastructure and introduce centralised file storage and sharing to improve document management		●			R 0	R 500,000	R 500,000	R 500,000	R 0	R 1,500,000
TA-6	Review ICT security management policy to improve the management of the network and server rooms - added emphasis to be on information security and data privacy policies - aligning these to POPi Act			●		R 0	R 0	R 0	R 0	R 0	R 0
TA-7	Procure fully VOIP services to reduce telephony costs and establish secure VPN/ MPLS access capabilities for all municipal buildings			●		R 2,100,000	R 2,100,000	R 2,100,000	R 0	R 0	R 6,300,000
TA-8	Plan, design and implement a fibre-optic intra-campus ring-feed WAN solution - to ensure consistent network connection				●	R 0	R 500,000	R 0	R 0	R 0	R 500,000
TA-9	Provide reliable user wireless connectivity (WIFI) for the Dutywa campus (all buildings in Dutywa)				●		R 300,000	R 0	R 0	R 0	R 300,000
TA-10	Convert municipal buildings to the hotspots for FREE WIFI after hours and on weekend - to provide community members with access	TA-9			●		R 250,000	R 0	R 0	R 0	R 250,000
	TOTAL					R 3,300,000	R 3,950,000	R 2,700,000	R 600,000	R 100,000	R 10,650,000

9.4 Strategic action plans for Data Architecture

Table 14: Strategic action plans for Data Architecture

Action #	Plan Name	Dependence	Fix-IT	Standardize-IT	Revolutionize-IT	FY2020/21	FY2021/22	FY2022/23	FY2023/24	FY2024/25	TOTAL
DA-1	Ensure data privacy policy makes provision for archiving, data encryption, back up and is aligned to best practices.			●		R 200 000	R 500 000	R 0	R 0	R 0	R 700 000
DA-2	ICT Steering Committee to ensure that new systems acquired pass the integration tests which include core functionality integration, metadata integration and file transfer - within systems	AA-1			●	R 0	R 0	R 0	R 0	R 0	R 0
	TOTAL					R 200 000	R 500 000	R 0	R 0	R 0	R 700 000

9.5 Summary of strategic initiatives

In summary, the 5-year implementation plan is as follows;

Table 15: 5-year project implementation summary

ICT Portfolio	Fix-IT	Standardize-IT	Revolutionize-IT	FY2020/21	FY2021/22	FY2022/23	FY2023/24	FY2024/25	TOTAL
1 Application architecture	5	3	9	R 4,050,000	R 8,280,000	R 5,530,000	R 1,550,000	R 1,974,750	R 21,384,750
2 Technology architecture	3	2	5	R 3,300,000	R 3,950,000	R 2,700,000	R 600,000	R 100,000	R 10,650,000
3 Business architecture	2	4	3	R 75,000	R 270,000	R 75,000	R 75,000	R 75,000	R 570,000
4 Data architecture	0	1	1	R 200,000	R 500,000	R 0	R 0	R 0	R 700,000
TOTAL	10	10	18	R 7,625,000	R 13,000,000	R 8,305,000	R 2,225,000	R 2,149,750	R 33,304,750

It is envisaged that implementing these projects will improve the ICT infrastructure in MLM.

10. Critical Success factors

The successful implementation of the identified projects herein will rely on a combination of critical success factors. The factors listed below are important, though not limited;

1. **Management support:** management support is critical for the implementation of this ICT Master plan. MLM will have to treat ICT as an enabler as opposed to treating it as an operational item – or a cost item in the budget.

2. **Ownership:** ICT ownership must be firmly entrenched in a Section 56 role – as if the Section 56 is a Chief Information Officer. Also, the role of the ICT Manager has to be amplified as a control and risk owner, to ensure that performance management of ICT is treated as a strategic issue even at the Executive Management meetings. This will result in effective ICT implementation and performance management.

3. **Continuous measurement:** the annual targets set herein must be reviewed annually and adjusted to suit the ever-changing needs of the municipality.

4. **Prioritisation of ICT in community engagement:** a political decision with regards to the adoption of ICT in the MLM community engagement processes will be crucial for the effective implementation of this ICT EA.

5. **Municipal-wide engagement:** the ICT Master plan has been developed in lay terms to enable many stakeholders and internal users to understand the vision. Thus, the implementation must be coupled with municipal-wide engagements to foster innovation and to enable change management.

6. **Customer-centric culture:** this culture will ensure that ICT services are provided and aligned to improve the livelihood of the citizens of MLM.

11. Conclusion

This ICT Master Plan is designed to increase the responsiveness of the municipality to its citizens. The 4th Industrial revolution beckons on all municipality to become smart cities/ towns and to adopt technologies that will enable the citizens to access information freely and independently.

It is envisaged that the collective implementation and monitoring of the actions plans documented herein, will yield very positive results for the Mbhashe communicated.